THE
AHRC ICT
METHODS
NETWORK

EDITED BY LORNA HUGHES

CONTENTS

PREFACE

Launched in October 2003, with funding of £3.8m, the ICT in Arts and Humanities Research Programme is one of the AHRC's Strategic Programmes and will run until September 2008. Its aims are to build national capacity in the use of ICT for arts and humanities research and to advise the AHRC on matters of ICT strategy.

This volume is a record of the achievements of the AHRC ICT Methods Network, the largest single funding commitment of the ICT Programme and a crucial support for its work. The volume contains an extensive description of the Network's activities with, as its conclusion, an assessment of its achievements and of the lessons to be learnt from them. The conclusion is not a formal evaluation, which will be carried out by the AHRC at the end of the ICT Programme; it is the independent view of two leading UK exponents of arts and humanities computing who have been connected with the Network in different ways (one a member of the Academic Advisory Committee, the other of the Steering Committee), but have not been formally part of the project.

From its first conception, the Methods Network was intended as strictly complementary to the Arts and Humanities Data Service (AHDS), the latter being concerned with data creation, curation and preservation, the former with digital processes and data use. In practice the two organizations have worked very closely together in a collaboration which has been highly fruitful in all sorts of respects. This applies particularly to developments in the area of e-Science, as will be described below, and to other areas as well, including the development of the ICTGuides on-line knowledge base of training and methodological resources in the use of ICT, and a shared agenda for the integration of methodologies of use in data creation projects.

Another, fundamental and equally fruitful feature of the Methods Network has been the use it has made of responsive-mode funding, opening up to the academic community the opportunity to propose activities for the Network to sponsor. The description of these activities in the pages that follow shows how wide-ranging, innovative and effective they have been, covering not only almost all branches of the arts and humanities, but also a remarkable spread of information technologies. As a result, the volume serves not just as a record of the Network project, but as a map, a very impressive map, of current ICT-related research work in the UK arts and humanities as a whole.

When the Methods Network was established there was some hope that it would continue after the end of the three-year funding period, perhaps through a merger with the AHDS. Regrettably not only will the Methods Network not now continue, but the AHDS will cease to exist at the same time as well. We are fortunate, however, that there will be continued support, funded by JISC with a contribution from the ICT Programme, for some of the Network's functions, together with some of those of the AHDS. This will allow the continuation of the Arts and Humanities e-Science Support Centre, and further support and development both of ICTGuides and of arts-humanities.net, the system of on-line support resources for virtual communities of practitioners in the use of ICT for arts and humanities research.

This continued support will be, I hope, the foundation for a new beginning. It is vital that we should continue to build on the achievements of the Methods Network, and of the AHDS, in the new landscape in which we now find ourselves. That means looking for new sources of funding support, maintaining an active dialogue with the main current funders, JISC and the Research Councils, and also looking hard at the support and development opportunities that the other main stakeholders, universities and libraries, can provide out of their present resources. We are at a stage where greater self-help will be required from the communities of practitioners represented in this volume, and also a greater willingness and ability to argue the case for the work that they do, and especially to show evidence of its value, both in academic research terms and in terms of its broader uses to society. The reader will agree, I hope, that in the pages that follow there is a great deal of material to support this argument.

David Robey
Director
AHRC ICT in Arts and Humanities Research Programme

INTRODUCTION: REFLECTIONS ON THE AHRC ICT METHODS NETWORK

Marilyn Deegan, Lorna Hughes and **Harold Short**

The aim of this report is to provide information for the UK academic community about all aspects of the AHRC ICT Methods Network, funded from April 2005-March 2008. It outlines the original aims and objectives, and the activities that we have undertaken in order to fulfil these. The report is divided into four main parts. In Part 1, we describe the core activities that were undertaken by the Network Administrative Centre (NAC), including dissemination, bursaries, and the development of our 'virtual community' to support the network of practitioners using ICT for the arts and humanities. Part 2 describes the core network activities that were centrally organized by the Methods Network, including expert seminars and workgroups. In Part 3, we describe the distributed activities that were carried out by the community of experts, using Methods Network funding that was disbursed via open calls for proposals. The final part of this report is a conclusion, written by Susan Hockey (Emeritus Professor, School of Library, Archive and Information Studies, University College, London) and Seamus Ross (Humanities Advanced Technology and Information Institute, University of Glasgow). Their report is based on an extensive survey of organizers and participants involved in the Methods Network's programme of activities.

Background: Development of the AHRC ICT Methods Network

A significant number of digital resources is now available to arts and humanities researchers, and these resources have had a broad impact on scholarship. They facilitate the type of research which changes the paradigms of understanding and creates new knowledge, and they have enabled new modes of collaboration and communication. These resources have been created by research projects and projects based in libraries and archives, funded by organizations including JISC and the Mellon Foundation, as well as through initiatives such as the AHRC's resource enhancement scheme. The recent review of this scheme showed how, 'in a relatively short time, the AHRB/C has enabled a sea change in the production and exploitation of resources, especially digital resources, in the arts and humanities'.

Any sea-change of this sort requires support, and researchers need to be able to understand how using ICT methods will allow them both to create and to exploit digital resources to enhance their research. Accordingly, the Methods Network was funded by the AHRC ICT programme for three years to provide a national forum for the exchange, development and dissemination of advanced expertise in the use of Information and Communication Technologies (ICT) tools and methods in arts and humanities research. While other nationally funded services, such as the Arts and Humanities Data Service (AHDS), have supported the creation, management and preservation of digital resources, the Methods Network has been the only nationally funded project that has focussed on the use and value of digital methods and resources for scholarship and research.

The specific aims of the Methods Network were:

- To promote, support and develop the use of advanced ICT methods in arts and humanities research and to support the cross-disciplinary network of practitioners from institutions around the UK;
- To develop a programme of activities and publications on advanced ICT tools and methods and to ensure the broadest participation of the community by means of an open call for proposals for Methods Network activities.

In order to fulfil this remit, the Methods Network implemented a wide-ranging series of activities, publications, and collaborative partnerships. Throughout the three years of the Methods Network, we have ensured that all our activities contributed to our core objectives:

- To provide a national forum for the shared development and dissemination of expertise in the use of ICT for arts and humanities research across the whole range of subjects covered by the AHRC;
- To provide access to training for researchers and practitioners;
- To investigate and document new developments and advanced methodologies, research processes, questions, and methods;
- To encourage the use of ICT in arts and humanities research as broadly as possible, including at institutions where there is presently little or no activity in this area;
- To monitor and foster new research opportunities that are made possible through the use of ICT methods;
- To increase the overall profile of ICT in the arts and humanities;
- To explore and monitor new technologies that may be relevant to the arts and humanities;
- To foster new modes of collaboration;
- To encourage cross-disciplinary and institutional collaboration;
- To work with existing centres of excellence;
- To support the aims and objectives of the AHRC ICT programme, and the AHRC delivery plan, as they relate to the use of ICT for research.

Structure of the AHRC ICT Methods Network

The Methods Network was a multi-disciplinary partnership. It was co-directed by Harold Short (Director, Centre for the Computing in the Humanities, King's College London) and Marilyn Deegan (Director of Research Development, CCH). It is a collaboration between several institutions, and the involvement of senior academics from each institution as Associate Directors ensures broadest discipline coverage: Mark Greengrass (Professor of History and former Executive Director of the Humanities Research Institute, University of Sheffield), Sandra Kemp (Director of Research at the Royal College of Art) and Andrew Wathey (Vice-Principal at Royal Holloway, University of London). Tony McEnery, formerly Professor of English Language and Linguistics at Lancaster University was a Methods Network Associate Director prior to his appointment as Director of Research at the AHRC in September 2005. Sheila Anderson, Director of the AHDS, replaced him as an Associate Director.

The Network Administrative Centre (NAC) was based at CCH, King's College London. It co-ordinated and supported all Methods Network activities publications, as well as developing outreach to, and collaboration with, other centres of excellence and practitioners in the UK. It was responsible for strategic co-ordination of all activities, both centralized and distributed, and this oversight ensured that our programme of activities was able to fulfil the overall aims and objectives of the Methods Network.

The Methods Network had an AHRC Steering Committee, and an Academic Advisory Board, each representing a broad spread of academic disciplines within the arts and humanities.

Methods Network Programme of Activities and Publications

Core Activities

In the early phase of the Methods Network, we focused our resources and attention on building the framework and systems to support the 'Network', and consolidated this by developing a series of centralized activities organized by our co-Directors, Associate Directors, and Network staff. These initial events were carefully managed and highly structured, and in many respects, they set the tone for subsequent activities, by examining specific methods in particular areas of research and identifying current and future needs.

These initial activities were closely managed and administered by the NAC, following a programme of work set out in our original grant proposal to the AHRC. Each event followed a carefully agreed template, in order to gain the maximum benefit from a careful process of planning, delivery, publication and dissemination of results, and assessment, which in turn

fed into the planning of subsequent activities. The structured approach to running activities made it much easier to support the distributed activities that followed, as Methods Network staff could advise colleagues on the best approach to organizing successful and effective activities.

As we moved into a more distributed mode for our activities, the NAC focused on disseminating the outputs of Methods Network events, and organizing a number of core activities, which are described in more detail in the first section of the report.

Expert Seminars

The key activity for the first year (2005-6) was a series of five 'expert seminars' in the subject areas represented by our co-directors and associate directors: Linguistics, History and Archaeology, Literature, Music, and Visual Arts. Each of these events brought together an interdisciplinary group of experts to speak on aspects of their own research that presented their use of advanced ICT in the arts and humanities, and addressed the fundamental strategic questions related to the use of ICT in the arts and humanities:

• What can advanced ICT methods enable researchers to do that could not be done before?
• Do these methods enable 'old' research to be done in a significantly new way?
• In what ways does the technology serve the scholarship?

These seminars gave participants a forum to make recommendations for future Methods Network activities and publications (e.g., workshops, training materials, etc.) that could take the agenda further forward.

Most importantly from the perspective of dissemination of the outcomes and also for the legacy of the Methods Network, the presentations and discussions resulting from each of these events will be published in print in a special series edited by the Methods Network for Ashgate publishers, 'Digital Research in the Arts and Humanities'. The series will be authoritative, broad-ranging and practical, indicating where the main areas of future activity and engagement with ICT research methodology are likely to be.

In the second and third years of the Methods Network, the expert seminars were broader in focus, and addressed a number of specific themes, rather than specific disciplines. These included the evidence of the value of ICT in arts and humanities research, sustainability, and the digital tools agenda, working with collaborators and partners drawn from a UK-wide and international, network of practitioners.

Distributed Activities

In our second year, 2006, we undertook an internal assessment of our activities, and in close collaboration with our Executive, Steering Committee, and Academic

Advisory Committee, we began next phase of the Methods Network, issuing three successive calls for proposals for activities. The aim of these calls was to offer funding of up to £5000 per event to individuals or groups who wished to organize an event under the auspices of the Methods Network. This opened up the organization of Methods Network activities to the national community of experts working with ICT tools and methods, though with centralized support from the NAC as required, and with the NAC taking the main role in dissemination of the results of these events.

In each call, we invited the community as a whole to submit proposals for activities and publications that would address specific research issues or training needs, propose discussion topics, or develop a publication or project proposal. We also stressed that we welcomed suggestions outwith the parameters defined in the call. Proposals were reviewed by the Executive and other experts in the field, in order to assess their relevance to the Methods Network's mission and core themes, and also to ensure that there was even coverage across specific tools, methods, and across the subject areas supported by the AHRC. Through the three calls (June 2006, December 2006, and June 2007), we received sixty eight applications, and funded thirty eight events.

This flexible and responsive initiative proved hugely successful. Members of the community - the 'Network of Practitioners' - responded with great enthusiasm to each call for proposals, and ran an exciting programme of activities, all of which have produced publications and training materials for the community, and built momentum around specific topics related to 'advanced ICT methods'. This has overwhelmingly fulfilled our remit for community involvement. It is also important to note that these activities have not, in the main, been run by those already known for their involvement in the digital arts and humanities, but by academics and practitioners who may be new to the field (and who may not have been funded by the AHRC in the past), yet are developing and implementing ground-breaking ICT methods. It is worth pointing out how extraordinarily willing members of the community have been to give of their time in order to develop these events, for which we are extremely grateful. The Methods Network model for funding these activities was unique, and the response indicates that it addressed a real need in the community.

Key themes for Methods Network Activities and Publications

The question of 'methodologies of use' was a major theme running through all our activities and outputs. While we originally focused on 'methodologies of use' as a concept that related to the end-use of digital materials by scholars, it is increasingly obvious that 'methodologies of use' are a crucial component of the entire digital life cycle. The ultimate use of digital materials is a consideration that impacts decisions

made at every stage of this life cycle: selection, digitization, curation, preservation, and, sustainability over the long term. The way that digital resources are used may be unanticipated at the outset; or they may have value for different communities and disciplines than originally intended. Conversely, some digital resources are less valuable to scholarship because their creator did not factor methodologies of use into the development of the resources.

Furthermore, the use of digital resources presents scholars with a huge range of challenges. Currently, there is a serious dearth of tools available to properly exploit digital materials. Similarly, there is a lack of supporting infrastructure for digital scholarship at the institutional level. Questions of tools development and support for scholarship need to be factored into any discussion of methodologies of use.

Digital resources, while now ubiquitous (some 50% of projects funded by the AHRC have a digital output), are also expensive to develop, and it is timely to assess their value, use, and impact.

In order to address these issues, some broad themes were identified for the Methods Network to focus on in its programme of activities:

- Gathering evidence of value;
- Articulating, promoting and exchanging methodologies of use;
- Continuing to support and foster communities of practice and use of advanced ICT methods;
- Drawing up strategic recommendations for the future use of ICT in the arts and humanities;
- Promotion of collaborative research across and between disciplines;

The themes informed the development of Methods Network outreach and collaboration activities, as well as our deliverables and outcomes, and have built an evidence base for the future agenda for the integration of advanced methods across the whole range of the arts and humanities.

Collaborations and Partnerships

There is a broad and extensive international community of scholars using ICT in arts and humanities research, and one of the primary goals of the Methods Network was to cultivate and support this community, to ensure the exchange of expertise.

We achieved this by inviting the broadest participation in all Methods Network activities, and by taking a flexible and responsive approach to suggestions for activities, partnerships, and new directions. We also made a commitment to supporting broadest possible collaborations between academics, postgraduates, specialists, and members of other communities such as libraries, archives and museums, as well as disciplines outside the arts and humanities, and international

partners. The summary reports of our core and distributed activities in Part 2 and 3 of this report make clear the depth and breadth of our coverage, and also indicate how we have engaged with existing centres of expertise and excellence.

The Methods Network has also become engaged in a particularly productive range of collaborations and partnerships with ICT support organizations. We have enjoyed a extremely close collaborative working relationship with the AHRC ICT Programme and the Arts and Humanities Data Service. Our work with the AHDS on the e-Science in the arts and humanities agenda has been particularly helpful, and we have jointly managed the JISC funded Arts and Humanities e-Science Support Centre (AHeSSC) since its establishment in 2005. Our work with AHeSSC has enabled us to engage with the e-Science agenda for the UK's arts and humanities community. This has also enabled partnerships and outreach activities with communities of users who are not in the arts and humanities, but who wish to work with our community, including the e-Science Core programme, NESC, NCESS, RCUK, and EPSRC.

We have worked closely with the existing network of arts and humanities computing centres, and many scholarly and professional associations, These include: the Association for Computing in the Humanities (ACH) , the Association for Literary and Linguistic Computing (ALLC), the Computers and History of Art group (CHArt), Digital Resources in the Humanities and Arts (DRHA), the International Conference on Music Information Retrieval and Related Activities (ISMIR), and the Association of History and Computing (AHC). Each of these Associations hosts annual conferences, which are major fora for dissemination in the use of advanced ICT methods, and the Methods Network has presented papers or panel sessions at each.

The End of the Methods Network

The rest of this publication gives details of all the activities, publications and collaborations we have undertaken in the past three years, and the outputs and resources that are available to the community as a result of these activities. These include:

- Outputs from our activities, both centralized and distributed, that illustrate the use of advanced ICT methods for research in the arts and humanities;
- Development of arts-humanities.net, our online community which supports the exchange of expertise with wide participation throughout the academic and research support communities;
- Collaborations with practitioners using ICT methods in disciplines outside the arts and humanities;
- A wide range of publications and reports on many aspects of ICT in the arts and humanities, including training materials, reports, case studies, working papers, presentations at conferences, journal articles, etc;

- A series of print publications on advanced ICT research methods;
- The Methods Network website, a rich resource that points the community to appropriate tools, techniques, and resources.

The Methods Network has over its three years gathered a significant body of information showing examples of research that could not have been done before, of research that is being done in a new way, and of how technology is serving scholarship. We have come to the end of our funding period without having had an opportunity to fully interpret the material we have developed.

There is room for more work on the material we have developed, to articulate and make the case for a better understanding of the role of ICT in the arts and humanities, and to make strategic recommendations for taking the agenda forward. We hope that the concluding recommendations by Susan Hockey and Seamus Ross in the final part of this report will help formulate a better understanding of what has been accomplished, and what needs to happen next.

In order to ensure that the community continues to benefit from the resources developed through the Methods Network, the Centre for Computing in the Humanities at King's College London has committed to maintain the Methods Network website for the next three years. We are also very pleased to report that our virtual community project, arts-humanities.net, will be taken forward beyond the end of the Methods Network. Thanks to funding from JISC, and with help from the AHRC ICT Programme, the service will now continue until July 2010, and will continue and develop the AHRC ICT Methods Network's system of on-line support resources for virtual communities of practitioners in the use of ICT for arts and humanities research. arts-humanities.net will be based at the newly established Centre for e-Research, at King's College, London, directed by the current Director of the Arts and Humanities Data Service (AHDS), Sheila Anderson.

We hope that this will ensure that the Methods Network's programme of activities and outputs will continue to be visible, and that these materials will help foster a greater awareness of, and a raised profile for, the use of advanced ICT methods in arts and humanities research in the UK. Most importantly, we hope that these resources will remain useful to the community beyond April 2008, and that they will support the strategic case for the use and support of ICT for advanced research methods in the arts and humanities. Over the past thirteen years, the UK has been admired internationally for its centrally supported vision of the role and importance of advanced ICT in arts and humanities research of the 21st century. If this international standing is to be maintained, it will have to be through the collaborative efforts of individual institutions and scholars - at least until such time as a central vision can be re-born.

PART1: AN OVERVIEW OF CORE NETWORK ADMINISTRATIVE CENTRE ACTIVITIES AND RESOURCES Lorna Hughes

A. PUBLICATIONS AND DISSEMINATION

(i) Website

The Methods Network website was intended from the outset to be an essential and dynamic resource for the arts and humanities ICT community, and this aim has informed its development since 2005. It contains a wealth of information about all aspects of the Methods Network, including our organization, activities, and outreach. It has been a frequently updated and comprehensive repository of all Network outputs: reports, papers and presentations from our events, podcasts, training materials, etc. From a practical perspective, it enabled interaction with the Network, from allowing users to join the mailing list, subscribing to the RSS feed to be kept informed about new content, or using the more advanced community discussion and engagement features on arts-humanities.net. Most importantly, however, the website has become a significant resource where those interested in the use of ICT for the arts and humanities can go to find exemplars of the ways in which new technologies have had an impact on scholars in their subject areas and research communities. Uniquely among websites dedicated to this topic, the content is interdisciplinary, and provides information about the whole range of methods and tools for digital scholarship in the arts and humanities, and their communities of practice.

(ii) Outputs from Methods Network Events

The Network Administrative Centre (NAC) was responsible for dissemination of resources created by and for the Methods Network. Outputs from our activities were distributed via our website, and we experimented successfully with a number of tools and methods for electronic publishing and dissemination of these materials, including podcasts, blogs and wikis. A number of audio files of presentations and interviews are permanently available from the website. These outputs all illustrate ways in which advanced academic research is made possible or enhanced by the application of advanced ICT methods in the context of each specific event, and also demonstrate the value of these activities.

(iii) Publication series: Digital Research in the Arts and Humanities

The Methods Network has developed a series of volumes for the publishers Ashgate, based on expert seminars and a selected number of workshops. The series editors are Marilyn Deegan, Lorna Hughes and Harold Short. Each volume in the series is being produced for a specialist audience but will also be accessible to scholars from other discipline areas. The volumes will not only stand alone as guides, but will

collectively form a co-coordinated suite of materials, which in future may feed into other specialist workshops and training events.

The ultimate aim of these publications is to provide an authoritative reflection of the 'state of the art' in the application of advanced ICT methods to arts and humanities disciplines. It is intended that research practitioners will turn to them as a matter of course over the next few years, and that they will remain an important statement of current research at the time of publication.

The first volumes in the series are:
- **Virtual Representations of the Past**, edited by Mark Greengrass and Lorna Hughes;
- **Modern Methods for Musicology**, edited by Lorna Gibson and Tim Crawford;
- **Keywords and Word Frequency**, edited by Dawn Archer;
- **Text Editing, Print, and the Digital World**, edited by Marilyn Deegan and Kathryn Sutherland;
- **Revisualizing Visual Culture**, edited by Chris Bailey and Hazel Gardiner.

Proposals for volumes on practice-led arts, art and science, evidence of value, and e-Science have also been prepared, and are being considered by Ashgate.

(iv) Case Studies

The NAC developed a number of case studies of individual research and research projects employing advanced ICT methods as an integral part of the research process, in order to provide exemplars of particular applications of ICT. These include:
- STAR – Semantic Technologies for Archaeological Resources, Department of Archaeology at the University of Glamorgan;
- The Drawbots Project: Computational Intelligence, Creativity and Cognition: a Multidisciplinary Investigation, The University of Sussex and Lancaster University, the Creativity and Cognition Studios at the University of Technology, Sydney;
- EARS: ElectroAcoustic Resource Site, De Montfort University;
- Henry III Fine Rolls Project, History Department and Centre for Computing in the Humanities, King's College London;
- UCREL Semantic Analysis System (USAS), Lancaster University;
- The Sheffield Corpus of Chinese, The School of East Asian Studies and the Humanities Research Institute at the University of Sheffield;
- Establishing Collaborative Postgraduate Research Programmes and Integrated Teaching Agendas Using the Access Grid, University of Birmingham;
- Plebeian Lives and the Making of Modern London,

1690-1800, jointly run by the Humanities Research Institute, University of Sheffield and the University of Hertfordshire, with the Higher Education Digitization Service;
• The Historical Thesaurus of English, University of Glasgow;
• Analysis of the Effectiveness of Airborne LIDAR Backscattered Laser Intensity for Predicting Organic Preservation Potential of Waterlogged Deposits, University of Birmingham and the University of Exeter, with CAPITA SYMONDS, English Heritage, the Environment Agency, and Network Mapping Ltd;
• Multidimensional Visualization of Archival Finding Aids, Humanities Advanced Technology and Information Institute (HATII), University of Glasgow;
• North Sea Paleolandscapes, The University of Birmingham with the University of Southampton, BGS (British Geological Survey), Petroleum Geo-Services, English Heritage, BMAPA (British Marine Aggregate Producers Association), Aggregates Levy Sustainability Fund, TNO (Netherlands Institute of Applied Geoscience), and Tigress;
• The Jean Froissart Project, University of Sheffield, in partnership with the Royal Armouries Museum, with premises at Leeds, Louisville KY, Fort Nelson (Hants) and the Tower of London, the White Rose Grid and the World Universities Network, as well as various libraries and museums in France.

(v) Working Papers

A series of working papers was prepared, each focusing on a particular discipline but also highlighting areas where tools and methods are of interdisciplinary interest and benefit. The subject areas covered include: Museums and Cultural Heritage, Library and Information Studies, Performance, Archeology, Electronic Texts, Historical Research, Linguistics, Musicology, Art History.

The content of the working papers has now been divided up into wiki-length articles and all of these are available at: http://www.arts-humanities.net/wiki. Once registered, any user can comment on or edit the text of these papers; the intention is to gather community-generated material together to add value to the existing texts.

B. SUPPORT FOR POSTGRADUATES

As part of the Methods Network's commitment to supporting young scholars, a bursary initiative to enable UK based postgraduate students to present papers at the key arts and humanities computing conferences was developed. Conferences supported included: Digital Resources in the Humanities and Arts (DRHA), Computers and the History of Art (CHArt), the annual conference of the UK branch of the Association of History and Computing (AHC-UK), and EVA (Electronic Visualisation and the Arts). All students awarded a bursary were asked to write a conference report, and these are available on the Methods Network website.

The following is a full list of all bursary recipients:

DRHA 2007:
Maria Chatzichristodolou, Goldsmiths College, University of London
Sean Eisenstein, Plymouth University
Nancy Mauro-Flude, The Slade School of Fine Art, UCL, University of London

DRHA 2006:
Veronica Davis Perkins, Middlesex University
Isabel Gallina, University College, London
Jessica Laccetti, De Montfort University
Kenneth McBride, Dartington College of Arts
Michael Graham, Sheffield Hallam University
Delia Whitbread, University of Sunderland
Katherine Adams, University of Hull
Sebastian Lexer, Goldsmiths College, University of London

DRH 2005:
Dragos-Ioan Ciobanu, Leeds University.
Tom Clark, Sheffield University.
Juan Garcés, King's College London.
Leif Isaksen, Southampton University.
Simon Mahony, King's College London.
Amy Robinson, University College London.
Robert Ross, De Montfort University.
Mhairi-Louise White, Middlesex University.

CHArt 2007
Jeremy Ottevanger, University of Leicester
Aoife McNamara, Middlesex University, London.

CHArt 2006
Ximena Alarcon, De Montfort University, Leicester.
Maria Eisl, Goldsmiths, University of London.
Karen Gaskill, University of Huddersfield.
Stephen Gray, Northumbria University.
David Herbert, Loughborough University.
Richard Hooper, Chester University.

CHArt 2005
Francesca Franco, Birkbeck College, University of London
Simone Gristwood, University of Lancaster
Anna Milsom, University of Middlesex
Luis Sotelo, University of Northampton

EVA 2007
Chao-Yu Lin, De Montfort University
Mayra Ortiz Williams, University of Leicester

The AHC-UK 2007 conference: Distributed Ignorance and the Unthinking Machine: Computing in History Teaching
Margaret Cooper, University of Birmingham
Joshua Hutchinson, Durham University
Paul Waring, University of Manchester

The Methods Network also sponsored the **3DVisA Student Award** for an essay on an innovative application of 3D computer graphics to any area of study

in the arts and humanities. The winner of the Award was Matt Jones, M.Sc. Archaeological Computing: Virtual Pasts, University of Southampton, and his essay **Southampton in 1454: A Three-dimensional Model of the Medieval Town** is available on the *Methods* Network website.

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C. AHRC-EPSRC-JISC Arts and Humanities e-SCIENCE Initiative

e-Science as understood in the UK developed as a specific national agenda within e-research: it stood for a set of advanced technologies for collaboration and sharing resources across the Internet: so-called grid technologies, and technologies integrated with them, for instance for authentication, data-mining and visualization. In this sense the e-Science agenda is of primary strategic importance for the arts and humanities. Grid and associated technologies offer the prospect of new, cohesive frameworks for the deluge of dispersed data now available in the arts and humanities, and of finding new support for the collaborative work that is an increasingly important part of research in our area.

Recently the term e-Science has come to be used in a broader sense, to stand for any application of advanced information technologies to enhance and develop research across the whole range of academic disciplines. But in either sense e-Science has been an integral part of the Methods Network's mission from the very beginning. In recognition of the need for the Arts and Humanities to join the national e-science agenda, however, the AHRC and JISC together established an Arts and Humanities e-Science Initiative, subsequently joined by the EPSRC as well. A central part of this Initiative has been the JISC-funded Arts and Humanities e-Science Support Centre, or AHeSSC (http://www.ahessc.ac.uk), jointly hosted and managed by the Methods Network and the AHDS. AHeSSC was established in order to support the projects funded under the e-Science Initiative, and also the growing communities of practice in arts and humanities e-Science, Thus many aspects of its work are of relevance to, and have involved close collaboration with, the work of the Methods Network. These include:
- the development of case studies illustrating the use of grid technologies in the arts and humanities;
- identifying research questions and/or problems in the arts and humanities that might be addressed by grid technologies;
- understanding the ways in which new collaborative projects might be developed and supported;
- helping to identify and initiate partnerships;
- addressing the questions of peer review and assessment raised by digital research work, and its implications for the RAE;
- identifying, documenting and disseminating new ICT research methods that may result from such work.

Other activities funded under the e-Science Initiative include a series of workshops and demonstrators, and a scheme of research grants and postgraduate studentships. Seven awards were made under the latter in 2007 across a wide range of subjects in both the arts and the humanities, from dance and music to museum studies, archaeology, classics and Byzantine history, and across a wide range of e-Science technologies. The Methods Network has taken a major interest in all these projects, and has helped to support and disseminate their work. As co-Director of AHeSSC and Manager of the Methods Network, Lorna Hughes has also played a major part in representing the Arts and Humanities in national-level e-Science discussions.

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D. ARTS-HUMANITIES.NET

The Methods Network has identified a wide range of communities of practice, supported them by documenting methodologies of use, and worked on building a wider digital arts and humanities community with interdisciplinary links. Arts-humanities.net (http://www.arts-humanities.net/) is a virtual community of arts and humanities researchers using ICT methods, developed by the Methods Network to exploit Web 2.0 technologies to enable users to share and discuss ideas, promote their research, and discover the digital arts and humanities as a whole. The project is a collaboration and open for anyone to join. The site is a virtual 'bridge' connecting the various disciplines and communities supported by the Methods Network and by the AHDS. It does not replace existing community sites and portals, but rather creates a meta-community site that serves as exploratory tool, directory and match-making agency, a bridge across communities, and aggregator of content. Communities will either find their virtual home on arts-humanities.net, have a virtual branch on the site, or simply choose to announce specific events or flag issues for discussion.

From April 2008, the site will be funded by JISC, with a transitional contribution from the AHRC ICT Programme, and development will continue at the newly formed Centre for e-Research at King's College London, which hosts the site and co-ordinates the development.
The site presently includes:
- General discussion forums and specific forums for the several communities;
- Blogging for all users. an ICT events calendar, a digital arts and humanities wiki;
- Searchable user profiles to facilitate networking;
- An advanced rights management system, allowing viewing and editing of content by certain groups, all registered users, or the public;
- Support for audio and video content;
- Automatic announcements of new content to social networking and bookmarking sites (such as Technorati); full RSS support, with integration of content from other sites via RSS;
- Discussion and tagging of all content by the users, using both the AHRC subject-list and/or a folksonomy developed by our users, built around the methods taxonomy from the AHDS ICTGuides project.

PART2: CORE METHODS NETWORK ACTIVITIES: EXPERT SEMINARS AND WORKGROUPS Lorna Hughes

DIGITAL TOOLS FOR THE ARTS AND HUMANITIES (2 WORKGROUPS)

Convened by: Lorna Hughes, Manager, AHRC ICT Methods Network

Despite a number of initiatives to develop tools to support ICT methods in the arts and humanities, there is still a lack of effective tools to support digital scholarship in the arts and humanities. As this is a core strategic issue, the Methods Network convened an ongoing workgroup to examine the financial, social, and political factors that help or hinder the development of such projects. This workgroup has been organized by the Network Adminstrative Centre at King's College London, but with extensive community input from specialist practitioners. The workgroup has explored the topic, reported on key issues and developments, and identified some needs and opportunities.

Particular attention has been paid to the tools development work undertaken through the UK's e-Science programme. This work has been facilitated by the Methods Network's involvement with the Arts and Humanities e-Science Support Centre (AHeSSC), in partnership with the AHDS. The e-Science scoping survey (www.ahessc.ac.uk/scoping-survey) developed by the AHDS has been particularly informative for this purpose. We have also incorporated the tools agenda - in particular, an assessment of the use of e-Science tools by other communities - into the Theme on e-Science in the Arts and Humanities, which we are running through the generous sponsorship of the e-Science Institute in Edinburgh.

We have engaged with international activities in the field, including the ACLS report on Cyberinfrastructure for the Humanities and Social Sciences (www.acls.org/programs/Default.aspx?id=644), which addressed the issue of tools in some detail, and the Summit on Digital Tools for the Humanities at the University of Virginia in September 2005 (see www.iath.virginia.edu/dtsummit/ for the report of this event). We have also had discussions about this issue with representatives of the US centerNet initiative (digitalhumanities.org/centernet/).

Two workgroup meetings have been convened, each addressing a particular strategic component of the agenda for developing digital tools for the arts and humanities.

Tools Workgroup 1

Organized by Lorna Hughes, David Robey, AHRC ICT Programme and Sheila Anderson, AHDS. Held at the Centre for Computing in the Humanities, King's College London, 15 June 2006

Participants: David Shepherd, University of Sheffield; Vince Gaffney, University of Birmingham; Sheila Anderson, Director, AHDS; Geoffrey Rockwell, McMaster University; Susan Hockey, University College London; John Bradley, King's College London; Edward Vanhoutte, Royal Academy of Dutch Language and Literature, Belgium; Ric Allsopp, Dartington College of Arts; Mike Meredith, Sheffield University; Geraint Wiggins, Goldsmiths College, University of London; David Robey, AHRC ICT Programme.

The first meeting of the workgroup was a strategic event, organized with a view to developing the case for public funding of arts and humanities tools, especially in connection with the Arts and Humanities e-Science Initiative (www.ahrc.ac.uk//e-science/). The Methods Network collaborated with the AHRC ICT programme and the AHDS to bring together a group of key stakeholders - all experienced in the development, support and implementation of projects to develop digital tools in the arts and humanities - with the aim of producing a brief report with some key points about the digital tools agenda.

The key findings of the group were strategic: Sustainability of tools over the long term is of critical importance, and must be considered at the outset of a project. This has implications for not just the migrating or 'upgrading' of tools over time and operating systems, but also maintaining support for the end user. If tools development projects are successful, an expanding community of practitioners will use them. These users must be supported over the long term.

Commercial relationships may also be essential to this sort of work - how are such partnerships to be managed and approached? How is the infrastructure and staffing required for digital tools development to be provided? How can the arts and humanities creatively break a 'culture of dependency' where we have no support for 'blue skies' thinking and research?

How can humanities and arts research questions, and the tools that support them, be of benefit for other subject areas? Humanities data is complex and non-standard, and tools to analyze this sort of data may well be of interest to other disciplines. How do we sustain this interdisciplinary work? There is also a need to find out what tools already exist. Often, tools developed by other academic disciplines and subject areas may be applicable to the arts and humanities. A list of existing tools should be maintained for and by the community.

Tools development is often collaborative by nature, across disciplines and subject areas, and often involving, for example, arts and humanities academics and computer scientists, engineers and HCI experts. These partnerships can be challenging, and the event addressed a number of issues around collaboration: How are such collaborations fostered and supported? How are such partnerships brokered in the first instance? How is this work rewarded and evaluated by the different communities represented?

The group then identified the following areas as particularly promising for future tools development:
- Tools to automate/assist with tagging and annotation;
- Knowledge mining and organization tools;
- Visualization tools;
- Tools for temporal and spatial exploration and representation;
- Tools for mining non-textual resources;
- Grid tools;
- Capturing processes.

Outcomes:

The report of this event was made available to the EPSRC, as well as the findings of the AHDS e-Science scoping survey. It was subsequently agreed that the EPSRC ICT programme would contribute £800,000 to the AHRC-JISC Arts and Humanities e-Science Initiative.

Tools Workgroup 2

Organized by Lorna Hughes, Torsten Reimer, and David Robey. Held at the Brunei Gallery, SOAS, University of London, 13 November 2007

This follow-up event picked up several themes discussed at the first meeting, and examined them in the context of a number of projects. The workgroup also explored international perspectives on digital tools development.

The first part of the day was devoted to projects funded through the Resource Development strand of the AHRC ICT Programme's ICT Strategy Projects. These projects have developed tools and resources of broad relevance across the range of the AHRC's academic subject disciplines. The presentations went into some depth about the research questions and methods that these tools had enabled. The afternoon sessions were devoted to a discussion of the practical aspects of tools development. Presenters discussed the necessary collaboration with computer science and technologists, and ways in which these collaborations can be supported. The need for high-performance computing for the arts and humanities was also discussed.

Presenters and Projects

'Making Space: A Methodology for Tracking and Documenting the Cognitive Process in 3-Dimensional Visualization-based Research', Richard Beacham and Drew Baker, King's College London
'ARMADILLO: Information Mining in Distributive Research Datasets in the Arts and Humanities', Mark Greengrass and Jamie McLaughlin, University of Sheffield
'ICT Tools for Searching, Annotation and Analysis of Audio-Visual Media', Alan Marsden, Lancaster University
'The Hunt for Submarines in Classical Art: Mappings between Scientific Invention and Artistic Inspiration', Mike Pringle and Rupert Shepherd, University of the Arts, Farnham
'Making the LEAP: Linking E-Archives and E-Publications', Julian Richards, York University
'Lexical Searches for the Arts and Humanities', Jeremy Smith and Christian Kay, University of Glasgow
'Creation of a flexibly searchable streaming media archive of contemporary and modern art theory and practice', Robert Zimmer, Goldsmiths College, University of London
'Rules of the Order: Managing the MONK Project', Stephen Ramsay, University of Nebraska
**'Communities, Tools, and

Dissemination', Craig Bellamy, AHDS, and Torsten Reimer, AHRC ICT Methods Network
'Zotero - Ups and Downs of Humanities' Tools Development', Dan Cohen, George Mason University
Round table discussion: 'Tools development agenda of the future' with Sheila Anderson, AHDS and CeRCH; Paul Ell, Queen's University Belfast; Lorna Hughes, Centre for Computing in the Humanities, KCL; David Shepherd, University of Sheffield. Chaired by David Robey.

The Future?

The Round Table discussion at the end of the event tied together a number of themes. The need to address the postgraduate training agenda was discussed: postgraduate students often see ICT as core to their research, but do not have access to the support that they need to use these tools. There must also be better provision of access to existing tools, as researchers may not be the best people to advertise the result of their work. Again, a need for access to tools that already exist was identified, as well as exemplar materials on how to use them in the arts and humanities, and support for users of these tools over the long term. There is still a need for funding for digital tools development in the arts and humanities, and in future the community will need to foster interdisciplinary partnerships in order to obtain it. We also see a clear need for the creation of ICT tools or methodologies that:
- Have a clear potential to enhance or develop research across a range of subjects in the arts and humanities;
- Present a significant research or development challenge in terms of ICT;
- Involve collaboration between ICT specialists and arts or humanities scholars.

The strategic issues related to digital tools in the arts and humanities have not been solved by this workgroup, but they have been highlighted, and this may be something that a network of arts and humanities computing centres could further act

EVIDENCE OF VALUE: ICT IN THE ARTS AND HUMANITIES (EXPERT SEMINAR)

Organized by Mary Jacobus, Centre for Research in the Arts, Social Sciences and Humanities CRASSH Alan Blackwell, Computer Laboratory, Crucible and David Robey, AHRC ICT in Arts and Humanities Research Programme. Held at University of Cambridge, 11-12 January 2007. Co-sponsored by the Arts Council.

Researchers in the arts and humanities increasingly apply (or are urged to apply) ICT methods to pursue their research or to enhance research materials in order to make them available to researchers. Many of the technologies now available - whether linguistic corpus analysis or data analysis; text editing; music or image analysis; or GPI - use techniques at the boundaries of computer science.

New Research Methods

The use of new research methods raises questions about their value to the arts and humanities domain. What difference do they make, what do they enable that could not be done before, and what evidence of value do they provide? The application of ICT methods also raises larger questions, including attempts to address the value of the arts and humanities more generally, as well as questions involving monetary measurement, or value for money: for instance, the potential for arts and humanities research to provide a talent-pool or source of innovation for the 'creative industries'. Among the questions posed by the Evidence of Value consultation seminar were the following:

• How and where (and for whom) should we look for evidence of value in the application of ICT in arts and humanities research?
• Are technical achievements separable from the intellectual ends served by ICT methods for research?
• Can ICT act as a stimulus for innovation in arts and humanities research?
• Where ICT methods involved in arts and humanities research are costly (and they often are), what kinds of priorities and justifications can be made?
• If comparisons are to be drawn across disciplinary boundaries, what measures can be used?
• Should comparisons involve metrics, or can they be qualitative?

Research Projects and Conferences

The event brought together policy makers, people from the creative industries and academics in a wide range of arts and humanities fields. Because it was partially funded by the Arts Council it was an event that raised questions and involved people working outside of academia, and encouraged interaction. This interaction has led to some very significant and ongoing outcomes:

• 'Interdisciplinary Innovation: strategic creation or self organising success', a NESTA funded project hosted at CRASSH. Members of the research team for this grant met at the event, which later resulted in the bid.
• A series of CRASSH graduate workshops was augmented with presenters who attended the Evidence of Value event speaking on 'Practising Interdisciplinarity', and 'The Sight of Sound: Intermedia'. These events encouraged the further sharing of expertise outside of disciplinary boundaries.
• Lee Wilson of CRASSH is currently carrying out an ethnography of the use of ICT amongst arts organisations in the east and northwest of England. This project came about as a consequence of discussions and connections between participants at the Evidence of Value seminar. This direct engagement with 'public' bodies and sharing of ideas and expertise was facilitated by the event.
• A major international conference, funded by CRASSH, Intel, BT and the Museum of Archeology and Anthropology in Cambridge, called 'Subversion, Conversion, Development: Public Interests in ICT' (24 - 26 April 2008) came about directly as a result of the issues discussed at the event and further conversations around these themes. It is hoped this will result in an application for a major international research project.

Presentations and Discussion Sessions

'Digital Repositories: Valued Resources or Data Tombs?' Geoffrey Khan, Oriental Studies; Matt Riddle, CARET; John van Wyhe, The Complete Work of Charles Darwin Online; Ellis Weinberger, Taylor-Schechter Genizah Research Unit, University Library; Chair: Lee Wilson, CRASSH.

'Knowledge on the Move: What is Transferable About 'Knowledge' and What Does this Imply?' David Good, Social & Political Sciences; Robin Boast, Museum of Archaeology and Anthropology; James Leach, Social Anthropology; Chair: Mary Jacobus, CRASSH.

Discussion led by David Shepherd, Humanities Research Institute, University of Sheffield and John Holden, Head of Culture at Demos.

'Public Value: Who are the 'Public' and What Might 'They' Want?' Francois Penz, Art and Architecture; Christopher Burlinson, Scriptorium: Medieval and Early Modern Manuscripts Online; Hildegard Diemberger, Tibetan-Mongolian Rare Books and Manuscripts Project, MIASU; Chair: David Shepherd, Humanities Research Institute, University of Sheffield.

'Discussion: Whose Art Is It Anyway' led by John Knell, Intelligence Agency.

'Does Innovative Technology Lead To, or Depend On, Innovative Arts Research in the Creative Economy?' Maureen Thomas, Art and Architecture; Ian Cross, Music; Madeleine Clegg, Department for Culture, Media and Sport; Dawn Giles, Arts Council East; Peter Tyler, Land Economy; Chair: Alan Blackwell, Crucible.

HUMAN ENHANCEMENT TECHNOLOGIES: THE ROLE OF ART AND DESIGN (NEW TOOLS AND METHODS) (EXPERT SEMINAR)

Organized by Sandra Kemp, Royal College of Art and Methods Network Associate Director, and **Anthony Dunne**, Head of Design Interactions, Royal College of Art. Held at the Goethe-Institut, London, 12 February 2008.

This event explored the potential of the arts, and in particular design, as primary tools for critical reflection and engaged debate on the social and ethical implications of the current rapidly emerging biotechnologies. The day focused on the exploration, production and display of both artworks and hypothetical products as an innovative and accessible way of generating public engagement concerning the impact of biotechnology.

The Implications of Human Enhancement

Through a series of presentations and discussions, the seminar explored the role of the arts and design in shaping the 'enhanced' future human body, with respect to the growing potential for enhanced physical, cognitive and emotional identities through biotechnological intervention. As well as considering the ways in which they might shape future aesthetic considerations, there were discussions about how those involved in arts and design could address issues of urgent public concern regarding the social and ethical implications of these new technologies.

Michael Burton: Human Enhancement Technologies - the Foot

The organizers of the event brought together experts from a wide range of communities to explore how new technologies - including rapid prototyping, MRI scanning, CAT scanning, and genetic portraiture - that are interdisciplinary in nature can affect the development of disciplines, and the research processes within those disciplines. The presenters and audience included artists, designers, curators, philosophers, medical and pharmaceutical industry representatives, and representatives of government agencies including Foresight (DTI) and Demos.

Collaboration Between Art, Design and Science

The event allowed participants to engage in a very open and vibrant discussion across disciplinary boundaries. Participants explored the research implications of collaborative projects between art, design, and science and considered ways in which the debate has the potential to engage research councils and industry. These open and stimulating discussions were conducive to the idea of taking forward future collaborative grant applications. In particular, participants were keen to explore the idea of applying for a network grant to consolidate and extend the network of practitioners who attended this event, and to carry on the conversations that took place.

Future Discussions

The organizers are keen to build on the overwhelming interest and stimulating discussions that took place at this event and the RCA will host a follow up event in Summer 2008. A website and active blog dedicated to the event can be found on the RCA website, with presentations, video and audio materials, and discussions amongst participants. This blog enabled organizers and key participants to pool knowledge and engage in conversation before and after the event. Icon magazine will produce a

The entrance to the Future Face exhibition at the Science Museum (London, U.K. 2004-5). From Left to Right: Harwood, White Man Black Mask (courtesy of Mongrel), Michael Najjar, Dana_2.0, 1999-2000 (courtesy of Michael Najjar), Peter Menzel, 2nd Generation Face Robot 2000 (courtesy of Menzel Studio, Science Photo Library)

special issue on this event, and the Journal for Technology and Bio-ethics, based at the University of California at Berkeley, have invited Sandra Kemp to edit a special issue around the event and the issues it raised.

Presenters and Presentations

'A Case for Human Enhancement', Andy Miah, University of the West of Scotland
'Human Enhancement and Communication', Jon Turney, Imperial College
'Design Approaches to Human Enhancement and Biotechnology', Anthony Dunne, Royal College of Art
'Symbiotica'. Oron Catts, University of Western Australia
'BioArt Approaches to Human Enhancement and Biotechnology', Jens Hauser, Curator
'Human Enhancement Technologies, Art and Identity', Sandra Kemp, Royal College of Art
'Human Enhancement Technologies in Film and Cinema', Noam Toran and Onkar Kular, Royal College of Art

LINGUISTICS: WORD FREQUENCY AND KEYWORD EXTRACTION (EXPERT SEMINAR)

Organized by **Tony McEnery,** **Department of Linguistics and English Language, Lancaster University.** Held at Lancaster House Hotel, Lancaster, 8 September 2005.

As Marilyn Deegan noted in her rapporteur's report, 'the world is awash with text, much of it available digitally, and making some sense of this plethora needs some structured

This event demonstrated ICT methods for word frequency analysis and keyword extraction, and other forms of text analysis based on corpus linguistics. These methods have been enabled by the availability of large quantities of machine-readable text and appropriate searching software. While participants at this event mainly came from linguistics and languages, the impact of the work they presented had clear applications for a number of areas in the arts and humanities, including literature; history; modern languages; politics and media studies. It was also relevant to the commercial sector: business, defence, and other arenas where it is vital that the key information in large digital collections is grasped rapidly and systematically.

Finding Common Ground

Presenters demonstrated their use of ICT tools and methods to develop new knowledge and research findings based on work with a number of existing corpora projects. These included the Corpus of Dramatic Texts in Scots; the Northern Ireland Transcribed Corpus of Speech; the Irish component of the International Corpus of English; the British National Corpus; and Historical Thesauri of English and Old English. Despite these diverse corpora, there was a degree of cohesion between many of the presentations in terms of theoretic underpinnings and findings

Unexpected Insights

The most obvious impact of ICT in this area is that it enables scholars to undertake research in more efficient ways: Mark Davies demonstrated that it is now possible to carry out simple word frequency queries on a 100 million word corpus in 1-2 seconds. However, as shown in several presentations, such methods can also become the gateway to a number of unexpected insights into the data in question and to allow scholars to validate or to invalidate claims of language or literature specialists in a more systematic way. VARD, a variant detector developed for use with the British National Corpus, allows the application of corpus linguistic methods to historical documents that are notorious for different spellings of the same word, thus allowing research that would otherwise have been impossible.

The Business of Keyword Extraction

The seminar identified a need for this work to be promulgated to, and used by, a wider community. Some of this research might be taken up by the e-Science community, particularly focusing on the use of ever-larger and distributed corpora, using collaborative, networked tools. Discussions established that is also necessary to consider knowledge exchange with the commercial world. The mining of large volumes of unstructured information is a key commercial research area in the areas of e-publishing, homeland security, and the corporate world. Keyword extraction is big business as well as a vitally important academic research area.

Resources and Follow-on Activities

• Reports and presentations, as well as full text and audio of the presentations, are available on the Methods Network website.
• A volume based on this event is to be published as part of the **Digital Research in the Arts and Humanities** series.
• The seminar was important for networking and brought some key players in the field together for the first time. Some participants went on to develop grant applications together.
• An application for a follow-on event Historical Text Mining was funded by the Methods Network.

Presenters and Presentations

'Word Frequency: Use or Misuse?', John Kirk, University of Belfast
'Word Frequency, Statistical Stylistics, and Authorship Attribution', David Hoover, New York University
'Word Frequency in Context: Alternative Architectures to Examine Related Words, Register Variation, and Historical Change', Mark Davies, Brigham Young University
'Issues for Historical Corpora: First Catch Your Word', Christian Kay, University of Glasgow
'In Search of a Bad Reference Corpus' Mike Scott, University of Liverpool
'Keywords and Moral Panics: Mary Whitehouse and Media Censorship', Tony McEnery, University of Lancaster
'The question is, how cruel is it?' Keywords in Debates on Fox Hunting in the British House of Commons', Paul Baker, University of Lancaster
'Love – a Familiar or a Devil? An Exploration of Key Domains in Shakespeare's Comedies and Tragedies'
Dawn Archer, University of Central Lancashire, Jonathan Culpeper, University of Lancaster, Paul Rayson, University of Lancaster

LITERATURE: TEXT EDITING IN A DIGITAL ENVIRONMENT; TEXT EDITING, SCHOLARSHIP, BOOKS AND THE DIGITAL WORLD (2 EXPERT SEMINARS)

Organized by **Marilyn Deegan** and **Harold Short**, Centre for Computing in the Humanities, King's College London and Methods Network co-directors, and **Kathryn Sutherland**, University of Oxford. Held at the Centre for Computing in the Humanities, King's College London, 24 March 2006 and 29 June 2006.

Originally imagined as one event, the two-part 'Text Editing' seminars looked at the state of electronic editing in a wider context, especially in relation to more traditional forms and brought together experts from different disciplines for high-level discussions. In terms of outcomes, these were both very fruitful events. The discussions at the first seminar led to a decision to run the second as an immediate follow-up event. Reflective reports were made available from both seminars, and presentations from both events became part of a forthcoming volume on text editing in the Methods Network book series. In addition, at least one participant reported that the event assisted him in preparing the ideas for a project proposal that has since been funded.

Evaluating the State of Electronic Editing

The seminars were an appraisal of the current state of electronic editing. They were also intended to provoke wider ranging discussions about its benefits and drawbacks, at least partially in the light of the conservatism of the academic establishment in according digital editions the same status as the book. The events considered the new kinds of editions and editing roles that had emerged from the electronic medium. Participants came from different disciplines interested in electronic texts – mainly literary scholars, textual scholars, literary historians and book historians; publishers were also present. The methods and broader questions relating to electronic editions are relevant to all these disciplines and the events followed this interdisciplinary approach throughout.

The Uses of Electronic Text

Electronic text (editing) facilitates searching, concording, hyperlinking and often allows cheaper integration of images, faster changes, additional commentary and further features such as easy comparison between variant texts ('De train der Traagheid' was one example of this). Larger electronic editions, in particular, are often collaborations not only between publishers and researchers, but also libraries, archives and often international groups of researchers. The use of ICT in editing is facilitating and enhancing existing research, making the research process faster and more streamlined, and allowing people to work together more easily - though at a higher cost.

Being able to integrate research materials and deliver them to a broader community of editors and users may allow scholars to ask new research questions. It is now possible, for example, to bring together in one electronic edition papyri that have been dispersed all over the globe, but it remains to be seen what new questions researchers will be asking about these. At the seminars, it was felt that if electronic editions are fundamentally (rather than merely technically) something quite different from print editions, then they can indeed change people's minds, or make us think in dynamic new ways about texts and what they mean.

From Inscriptions to Serials

The InsAph project, for instance, could have been imagined as a classical print edition (sans hypertext of course and as a very expensive undertaking), but lessons learned through that project will now allow the 'Inscriptions of Roman Cyrenaica' project to go one step beyond that (by linking inscriptions with spatial information). This is an example where electronic editions currently seem to be on the border between facilitating old research in more efficient ways and actually reaching a new level of scholarship. The 'Nineteenth Century Serials Edition' not only links a huge amount of complex text, it also models highly complex prosopographical relationships between people involved in producing periodicals – something that could not have been done in print and enhances our understanding of periodicals. It was also recognized that it is now much easier to facilitate the development of user communities around editorial projects.

Electronic Editing in Context

With the focus on electronic editions, methods of text editing and text markup were discussed, as was hypertext and digitization. The seminars did not focus on a particular tool or set of tools for creating digital editions; XML was of course prominent.

The seminars also addressed the importance of re-evaluating the theoretical and practical dimensions of electronic editing following a decade in which the number of digital editions expanded significantly. Questions were discussed about the relationship between electronic editions and electronic archives, the nature of electronic editions and their cultural status, especially in relation to the falling away of print in respect of the electronic edition. Other questions addressed included: will we continue to see the scholarly electronic edition as serving the needs of readers as well as users? Is the role of the editor changing in the electronic environment? What new

kinds of editing partnerships are emerging?

Part 1 Text Editing in a Digital Environment

Held Friday 24 March 2006, convened by Marilyn Deegan and Harold Short

This first seminar looked at a number of different projects and concepts around text-editing, electronic editing and the print world. Through presentations and discussions participants considered the new kinds of editions and editing roles that had emerged from the electronic medium. The seminar also addressed the importance of re-evaluating the theoretical and practical dimensions of electronic editing following a decade in which the number of digital editions expanded significantly.

Discussions about the resistance of the scholarly community to accept electronic editions or projects considered the possibilities of an inbuilt conservatism and a suspicion that electronic products are more ephemeral and perhaps less scholarly. While print texts can readily be placed in a scholarly hierarchy for example, those issued by a university press may be viewed as 'scholarly' even before the contents are examined, this is less obviously the case for electronic products. One way of addressing this issue would be to promote systems for peer review of electronic editions that are on a par with peer review for traditional publications, but specifically addressing issues of both content and the structural integrity, ease-of-use, and dynamism of the edition. This would support critical examination and assessment of the electronic

materials.

Presenters and Presentations

'Being Critical: Paper-based Editing and the Digital Environment', Kathryn Sutherland, University of Oxford
'Digital Editions and Text Processing', Dino Buzzetti, University of Bologna
'A New Paradigm for Electronic Scholarly Editions', Peter Robinson, Institute for Textual Scholarship and Electronic Editing, University of Birmingham
'Digitizing Inscribed Texts', Charlotte Roueché, King's College, London.
'Avant-textes, Intertexts, Hypertexts: Editing Genetic Documents', Daniel Ferrer, Institut des Textes et Manuscrits Modernes (ITEM), Paris.
'.... they hid their books underground', Espen S. Ore, National Library of Norway, Oslo.
'Every Reader His Own Bibliographer - an Absurdity?', Edward Vanhoutte, Royal Academy of Dutch Lang. and Lit. and University of Antwerp.
'Digital Editing, Text Markup, and the Construction of Textual Reality', Julia Flanders, Brown University, Providence, RI, USA.
Summary by Rapporteur - Sharon Ragaz, University of Oxford.

Part 2: Text Editing, Scholarship, Books, and the Digital World

Held on 29 June 2006, convened by Marilyn Deegan and Kathryn Sutherland

A number of important questions were raised at the first expert seminar, and the second event brought together a group of experts with the intention of specifically addressing these issues, which included:
• In an environment of print and electronic culture, how seriously do we envisage the falling away of print in respect of the electronic edition?
• What new kinds of edition are made possible through the

electronic medium?
• What constitutes an edition in the electronic medium? How is this related to the notion of an electronic archive?
• Do we still see the scholarly edition as serving the needs of readers as well as users?
• What do we envisage the cultural status of the electronic edition to be?
• Is the role of the editor changing in the electronic environment?
• What new kinds of editing partnerships are emerging?

Presenters and Presentations

'The Nineteenth Century Serials Edition (NCSE)', Jim Mussell and Suzanne Paylor, Birkbeck College, University of London
'Convenient Editions', Peter Shillingsburg, De Montfort University
'Electronic Editions and Collaborative Interpretation', Paul Eggert
"The HyperNietzsche Project", Julia Briggs, De Montfort University
'Editing Projects at Cambridge University Press', Linda Bree, Cambridge University Press
'Non-canonical Literary Works', Graham Law, Waseda University in Japan
'The Jonathan Swift Edition', Jim McClaverty, Cambridge University Press
'The DALF project', Edward Vanhoutte of the Centre for Text Editing (CTB) at the Belgian Royal Academy
'Digital Reunification of Jane Austen's Fictional Holograph Manuscripts', Kathryn Sutherland, University of Oxford.

MUSIC: MODERN METHODS FOR MUSICOLOGY: PROSPECTS, PROPOSALS AND REALITIES (EXPERT SEMINAR)

Organized by Tim Crawford, Department of Computing, Goldsmiths College, University of London and **Andrew Wathey,** Vice-Principal, Royal Holloway, University of London. Held at Royal Holloway, University of London, 3 March 2006.

This one day seminar explored the ways in which ICT is currently used to enhance research, teaching and learning in musicology, and addressed some prospects and proposals for ways in which it can be used and supported in the future. While the main focus of the presentations and discussions addressed music theory, performance analysis and traditional historical musicology, some consideration was also given to the ways that ICT can be used in creative music practice for example, performance and composition.

Improving Software for Musicology

There was a good deal of discussion about software tools for musicology, focusing on the functionality and use of existing tools (including tools for annotation, search and retrieval, structural and voice analysis) and how musicologists should be involved in the development of new tools. Music processing software must address issues concerning the computational representation of musical information and knowledge and, in particular, the dichotomy between symbolic and audio music representations. A recurring theme in the discussion was that attention must be paid to the development of appropriate user interfaces to ensure that they are used to fully visualize music information, and represent a multiplicity of views of the underlying data. This will enable new technologies to fully exploit networked online archives of visual and audio digital music resources, and for multiple methods to be applied to the data.

The Transformation of Musicological Practice

The seminar demonstrated several examples of ways in which the use of technology is transforming musicological practice, and enabling scholars to do research that would previously have been impossible. For example, Frans Wiering proposes a radical new approach to developing scholarly editions. His 'digital critical edition of music' is a multidimensional digital representation of musical works that enables new analysis of source materials. Michael Casey's work illustrates how similarity matrices can be used to visualize large-scale structural relationships both within and between audio recordings of musical works.

Trans-Disciplinary Engagement

However, if computing technology is to have a positive and long-lasting effect on musicology, the needs of the scholars must be considered and supported. This is an area where there is a need for technologists and musicologists to engage fully with each other.

David Meredith also notes that this has implications for postgraduate training, and that these developments are contingent on a cross-disciplinary ethos which requires the development of a more collaborative approach. He writes: 'gradually, the "lone-scholar" culture in musicological research should be replaced with a more collaborative culture like the one that is typical in scientific disciplines'.

Outcomes, Outputs and Next Steps

• Reports and presentations are available on the Methods Network website.
• A volume based on this event is to be published as part of the Digital Research in the Arts and Humanities series.

• A follow on event **'The Future of Information Technology in Music Research and Practice'** was funded by the Methods Network on 8 September 2006 . This event addressed the challenges of future training for musicologists . The organizers reported that the event facilitated a great deal of networking and fostering of communities which has laid the foundation for follow on work.

Presenters and Presentations

'Computer Representation of Music in the Research Environment', Geraint Wiggins, Goldsmiths College
'Digital Critical Editions of Music: A Multidimensional Model', Frans Wiering, University of Utretcht.
'Chopin Online: Music and Musicology in New Perspectives', John Rink, Royal Holloway, University of London.
'The Music Map: Towards a Mapping of ICT in Creative Music Practice', Celia Duffy, Royal Scottish Academy of Music and Drama.
'The Computer and the Singing Voice', David Howard, University of York.
'Filling Gaps between Current Musicological Practice and Computer Technology and IRCAM', Michael Fingerhut, IRCAM, Paris.
'Audio Tools for Music Discovery and Structural Analysis', Michael Casey, Goldsmiths College, University of London.
'ICT Tools for Searching, Annotation and Analysis of Audio-Visual Media', Adam Lindsay, University of Lancaster.
Summing up, led by rapporteur: David Meredith

PRACTICE BASED ARTS: 'BLUE SKIES AND SINGING RINGS': DIGITAL TECHNOLOGIES AND JEWELLERY OF THE FUTURE (EXPERT SEMINAR)

Organized by David Humphrey, Centre for Jewellery Research, Royal College of Art. Held at the Dana Centre, National Museum of Science and Industry, London, 26 October 2006.

Practitioners within the contemporary jewellery movement have a reputation for wide-ranging experiment and innovation in their approach to the forms, materials and processes of their discipline, including, in some cases, digital processes. The field as a whole, however, for a variety of reasons - some practical, others philosophical - has not yet engaged with the rapidly emerging potential of these evolving technologies.

Methods for Digital Jewellery

Contextualized by the field of contemporary jewellery but recognizing a world of shifting values and changing resources, the aims of the seminar were broad and cross-disciplinary: to stimulate debate and to open up channels of communication on a range of methods and opportunities. The event also highlighted issues resulting from developments in digital technology that confront the creators of contemporary jewellery, jewellery users and others in fields allied to that of jewellery. The seminar brought together an interdisciplinary group of speakers and delegates including practitioners and theorists from jewellery and the applied arts; fashion and textile designers; historians; critics; policy-makers and environmentalists. This group considered new research directives for the integration of digital technologies within the field of jewellery, and for the development of new research methodologies and innovative products.

The event identified key issues for the future development of jewellery in relation to digital technologies, and explored new working practices and methodologies. These included digital simulation; 3D modelling; the uses of global positioning and
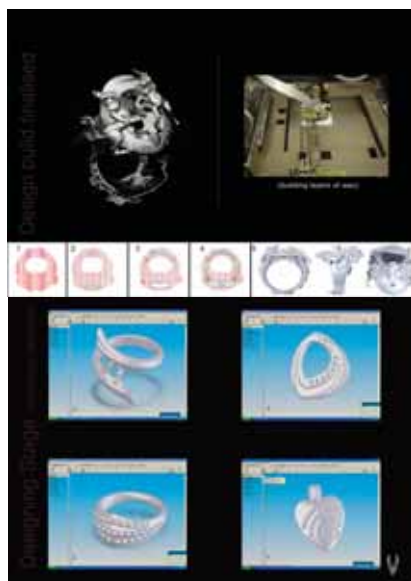
Leon Williams' work is an example of the rapid prototyping processes discussed at the seminar © Leon Williams, 2006

telephony; and the application of digital technologies to manufacturing.

A Way Forward for Digital Jewellery

Participants agreed that they will use arts-humanities.net as a means for future online collaboration. They also hope to have a number of smaller, follow up events to refine and consolidate some of the discussions begun on the day. Proceedings of the event are forthcoming in the journal Leonardo. A number of the participants have also contributed to an issue of the International Journal of Arts and Technology (IJART). One attendee has subsequently submitted a grant application to the Leverhulme Trust, involving some of the other participants; and a larger network which emerged from the event is putting forward a major application to the AHRC.

Examples of Jayne Wallace's recent research work exploring digital jewellery © Jayne Wallace, 2006

Presenters and Presentations

'New Technologies in Jewellery and Silversmithing Manufacturing', Karin Paynter, The Goldsmiths' Company

'Emotionally Charged: An Exploration of Digital Jewellery', Jayne Wallace, Sheffield Hallam University

'Jewellery and Sustainability: Production, Consumption and Disposal in the Supply Chain', Joan Farrer, The London Technology Network

'A Trip to the Future', Ian Pearson, BT Futurologist

'Associated Lives, Meanings and Shared Directions', Stephen Bottomley, Association for Contemporary Jewellery

'A Future of Technology, Jewellery and Medicine', Leon Williams, Centre for Jewellery Research, Royal College of Art

'Scentsor[ring]', Jenny Tillotson, Central Saint Martins College of Art and Design

'Throw a Few Rocks and Run Away', David Humphrey, Royal College of Art

SUSTAINABILITY OF DIGITAL RESOURCES IN THE ARTS AND HUMANITIES (EXPERT SEMINAR)

Organized by Lorna Hughes, Methods Network, King's College London. Held at King's College London, 29 November 2006.

Investment in digitization initiatives over the past fifteen years has created a substantial number of digital resources for the arts and humanities, and use of these resources is changing the way that scholars do research. However, there are concerns over their long-term sustainability. The recent AHRC Resource Enhancement Scheme Review noted that sustainability was an issue for a 'significant number' of projects. Projects require maintenance to respond to technological and software developments, allowing continued access to the resource and its functionality for users. Long-term projects require continued funding and staff time to develop the resource in terms of additional material, editing, indexing and cross-referencing. The question goes beyond that of 'preservation' of digital data. It concerns the long-term management of these resources over the entire 'digital life cycle'. This includes support for users of the resources; an understanding and awareness of methodologies of use; institutional commitment to digital resources and integration of research resources within institutional research cultures.

Perspectives on Long Term Sustainability

This event was held in parallel with the AHRC ICT Programme's working group on sustainability, which was planning the establishment of a network of arts and humanities computing centres in the UK (including HATII, University of Glasgow; CCH, King's College, London; HRI, University of Sheffield; and the Centre for Data Digitisation and Analysis, Queen's University Belfast) together with the AHDS subject centres, to take forward issues related to the long term sustainability of digital resources for the arts and humanities. The aim of the expert seminar was to open up the discussion to a wider group of stakeholders, and address sustainability from a number of perspectives: those of funding agencies, project directors, directors of centres and organizations, users, and other communities including libraries and archives.

Observations of the Group

The key issues addressed were the need for a set of high-level principles to govern the production and preservation of data resources (Michael Jubb of the Research Information Network), the range of issues to be taken into account at a more practical level in the arts and humanities (David Robey of the AHRC ICT Programme), a model system of quality assurance for data resources (David Bates and Jane Winters of the Institute of Historical Research), and the need to sustain not just the data produced but the centres of expertise that produce it (David Shepherd of the Humanities Research Institute, University of Sheffield). Participants were especially impressed by the detailed and systematic attention that the Andrew Mellon Foundation gives to the entire lifecycle of the data resources that it funds (Suzanne Lodato)—far more than public funders in the UK are able to afford.

Collecting Evidence of Value

Discussion covered both of the main types of concern relating to the long term preservation and accessibility of scholarly digital resources: academic sustainability – keeping a resource current in terms of its content -- and technical sustainability -- maintaining a platform for a resource to run on. There was agreement on the importance of collecting evidence of value of scholarly digital resources to academic and other communities in

Sustainability considerations for digital resources identified by Jane Winters at the event.

order to justify the current and future funding of such resources. Qualitative evidence, demonstrating what such projects have achieved in terms of advancing scholarship, is crucial. Consideration was also given to ways of distinguishing between digital resources that require long-term sustainability and those that do not.

The key point recognized at the seminar was that the consideration of sustainability issues is crucial to all stages of the life-cycle of digital projects and that there was a need for structure and policy frameworks which could be applied to the ongoing curation and maintenance of digital scholarly resources.

Presenters and Respondents

David Robey, AHRC ICT Programme.
Suzanne Lodato, The Andrew W Mellon Foundation, US.
Christie Carson and John Rink, Royal Holloway University of London
Michael Jubb, Research Information Network (RIN), London.
Rob Procter, National Centre for e-Social Science (NCeSS), University of Manchester.
David Bates and Jane Winters, Institute of Historical Research (IHR), University of London.
David Shepherd, Humanities Research Institute (HRI), University of Sheffield.
Lorna Hughes, Methods Network (Rapporteur)

VIRTUAL HISTORY AND ARCHAEOLOGY (EXPERT SEMINAR)

Organized by Mark Greengrass, Humanities Research Institute, University of Sheffield and AHRC ICT Methods Network. Held at University of Sheffield, 19 - 21 April 2006.

A Better Understanding of the Past

Historians and archaeologists have engaged in informed and advanced debates within their respective communities on the questions of how ICT can enable a better understanding of the past. Until now there has been little opportunity for cross-disciplinary exchange of ideas. This seminar was an important opportunity to address this issue, and a primary goal of the event was to encourage cross-disciplinary collaborations. The expert seminar took place over three days with an ambitious programme that covered a wide-ranging set of disciplines, tools and methods.

The programme focused on three subjects: the past and virtual representation of place and time; the past and virtual representation of texts; the past and representation of objects and events. Each session brought together specialists in the application of ICT to the historical and archaeological domains; recognizing that the two disciplines have much in common, yet are frequently isolated from one another.

Debating Representation

One of the central questions of this event was a 'post-modern' debate about how plausible it is to conceive of representation as objectivizing, a realization of the past, or if it is simply modelling or representing aspects of it in order to better understand it. Another theme related to this was how to model the past.

There were several sub-themes of this debate:

1. Modelling landscape and material culture - this discussion focused on questions of metadata standards and tools;
2. Representation in the form of ontologies and data mining - this issue lead to interesting areas of discussion for archaeologists;
3. Representation and reconstruction - participants at the event looked at the use of modelling to understand aspects of the past that do not survive, for example the restoration of historic manuscripts.

Enabling New Research

The variety of ICT tools and methods displayed included data-mining, 3D modelling, visualization, text analysis, digital preservation, and cultural heritage digitization. Some particularly significant new research was demonstrated using the following tools:

• Armadillo - a data-mining tool developed by the Humanities Research Institute at Sheffield. This tool uses sophisticated search algorithms to find information about people 'on the margins' of historical records.
• Adobe Photoshop – this software is used at an advanced level to apply different lighting conditions for document restoration. The use of Photoshop to analyse images of objects in ways that were previously impossible has been a recent development.
• The London Charter – (see also **Making 3D Visual Research Outcomes Transparent** workshop) – this document was new at the time of this expert seminar. It was a revelation to the archaeologists at the session who had been previously unaware of it.
• CIDOC-CRM cultural heritage metadata standards – these standards are incredibly important for creating ontological records for knowledge management and exchange. They enable collections to be linked as never before.

Linking Up Over the Access Grid

One particularly interesting aspect of the seminar was the opportunity to use the facilities at Sheffield University to link up by Access Grid with some delegates at the Computer Applications in Archaeology Conference, Fargo. Participants in Sheffield and Fargo considered together the ICT tools that are currently available which most effectively assist archaeologists to undertake data analysis in ways that were not available in the past.

Event Outcomes and Future Plans

• Full text and audio of the presentations are available on the Methods Network website
• A volume based on this event is to be published as part of the Digital Research in the Arts and Humanities series.
• The event brought together historians and archaeologists asking similar questions about the past and how ICT can enable a better understanding of that past. Before the event these communities had been working from their respective perspectives of humanities and sciences, and were not talking to one another.
• A successful £350,000 grant proposal that would not have happened had the seminar not taken place.

Subject 1: The Past And The Virtual Representation Of Place And Time

This session examined questions of the representation of spatial and temporal analysis in historical and archaeological data. Concluding discussions questioned whether it is possible to develop and apply ICT tools that adequately recover the ways in which senses of time and space are historically and archaeologically understood and in ways cannot be effectively presented through traditional media.

Presenters and Presentations

'Using GIS to Study Long-Term Population Change', Ian Gregory, Queens University Belfast, Northern Ireland.
'Which; What; When?', Manfred Thaller, University of Cologne, Germany.
'Visualization: Pretty Pictures or Enabling Technologies', Vince Gaffney, University of Birmingham, UK.
'Spatial Technologies in Archaeology in the Twenty-First Century', Paul Cripps, University of Southampton, UK.
Rapporteur Presentation by Kate Devlin, University of Bristol, UK.

Subject 2: The Past And The Virtual Representation Of Texts

This session critically assessed the degree to which ICT enables historians and archaeologists to interpret text in ways that have not conventionally been possible. Papers addressed: the application of advanced mark-up in historical and archaeological environments; the limited experience and great potential for data mining in historical and archaeological environments; the challenges of building the appropriate ontologies; and data linkage.

Presenters and papers

'Imaging of Historical Documents', Andrew Prescott, University of Sheffield, UK.
'Data, Structure and Analysis: XML Mark-up and its Application to Historical Data', Donald Spaeth, University of Glasgow, Scotland.
'Historical Documents and Encoding', Harold Short, King's College, London, UK.
'Finding Needles in Haystacks: Data-mining in Distributed Historical Data-sets', Mark Greengrass and Fabio Ciravegna, University of Sheffield, UK.
'Digital Searching and the Problem of the Ventriloquist's Dummy', Tim Hitchcock, University of Hertfordshire, UK.

A sample facsimile from the Electronic Beowulf, edited by Kevin Kiernan, showing a folio from British Library. This historical document was presented by Andrew Prescott in his paper at the seminar.

'Using Computer-Assisted Qualitative Data Analysis Software (CAQDAS) in Historical Research: Some Methodological Issues from the Experience of the 'Health of the Cecils' Project', Caroline Bowden, Royal Holloway, University of London, UK.
Rapporteur Presentation by Matthew Woollard, AHDS History
'Shared Spaces: Library and Archive Metadata, Encoded Documents and Research Needs', Susan Hockey, University College, London, UK.
'Attempts to Construct a Common Platform for Archaeological Reports', Julian D Richards, University of York, UK.
'Crossing an 'Information Divide': The OASIS Project and its Use of XML Schema', Catherine Hardman, University of York, UK.
Rapporteur Presentation by Seamus Ross, University of Glasgow

Subject 3: The Past And The Virtual Representation Of Objects And Events

In this session, presenters covered aspects of the virtual representation of historical objects and how best to record the various assumptions and circumstances that are included in any virtual representation. The objective of this session was to consider whether virtual representation is really helping to

Meg Twycross' virtual restoration of erased and overwritten portions of a manuscript from (Images York City Archives A/Y Memorandum Book :255r. © Meg Twycross)

answer major historical and archaeological questions. Though the community may, or even ought, to be skeptical about the research conclusions reached through virtual representation to date; however there are clearly large potential benefits of being able to study closely objects surviving in scattered locations, and of bringing a variety of skills to bear on them. Overall, the presentations in this session were concerned with present and future scholarly cost-benefit from research carried out using these technologies.

Presenters and papers

'Digital Artefacts: Possibilities and Purpose', David Arnold, University of Brighton, UK.
'"Oh, to make boards to speak! There is a task!" Towards a Poetics of Paradata', Richard Beacham, King's College, London, UK
'Constructing a Corpus of Material Objects: The Case of the Corpus of Romanesque Sculpture in Britain and Ireland', Anna Bentkowska-Kafel, Courtauld Institute of Art, London, UK.
'Virtual Restoration and Manuscript Archaeology: A Case Study', Meg Twycross, University of Lancaster, UK.
Rapporteur Presentation by Lorna Hughes, AHRC ICT Methods Network

VISUAL ARTS: FROM PIGMENTS TO PIXELS (EXPERT SEMINAR)

Organized by Mike Pringle, AHDS Visual Arts. Held at Chelsea College of Art and Design, London, 27 April 2006.

Organizing the distribution of, and access to, digital visual information is a complex and frequently unsatisfactory activity. The core of the problem lies in the very nature of digital images: through their makeup of simple pixels or point data, they tend to lack useful data for machines to interrogate or interact with. This makes art researchers' interaction with them dependent on added textual information. This seminar addressed this question from the perspectives of a number of key stakeholders in the visual arts community. In doing so, the event revealed deeper issues about the impact of ICT on visual arts research.

Radical Changes to Visual Culture

Rapporteur Chris Bailey describes this impact in some detail in his report:

'the impact of ICT in the visual arts goes way beyond the introduction of some new tools and methods. Rather, ICTs are radically changing the production of visual culture, its presentation and representation, and its analysis and evaluation. The shape of the 'field' is changing more rapidly than ever before. Furthermore, since 'research' in the creative disciplines is frequently equated with advanced practice it was possible to conclude that failure to invest in ICT to support research into and through the visual arts would be to fall far behind in the generation of new areas of knowledge and understanding'.

The seminar took two different perspectives on this complex landscape. The first session addressed the range of ICT-based methods for distributing and accessing visual information in a networked environment, while the second introduced a model of practice-based research, throwing up the questions that arise when ICTs are used in the creative process in the visual arts.

Finding New Approaches to Visual Arts Concerns

Both sections touched on a range of questions around accountability, governance and control. There was also discussion of new tools and methods, which can be broadly categorized into two groups: the analytic and interpretive, and the problem-solving and creative. It was clear that there is also scope for the use of technologies from unrelated research fields, especially those concerned with visualization in medicine and navigation, to generate new approaches to problems in the visual arts. The discussion also recognized that researchers outside of the visual arts community are increasingly interested in digital images.

Involving Digital Image Communities

Experts from a wide range of disciplines attended this event. They included designers and artists, art and design historians, archaeologists, curators, archivists, librarians and information managers and visual arts technology consultants. While this was not a wholly inclusive representation of all the research communities that now make regular use of digital images, the meeting exhibited the very wide range of research questions that are currently being posed, and addressed, using visual arts research methods.

Documenting and Encouraging Discussion

• The Rapporteur's report and abstracts of all presentations are available on the Methods Network website.
• A volume based on this event is to be published as part of the **'Digital Research in the Arts and Humanities'** series.
• The seminar reflected and helped consolidate discussions that had been introduced by the community of practitioners at CHArt (Computers and the History of Art group) conferences.

Presenters and Presentations

'Use and Development of Traditional Text-driven Methods for Cataloguing and Aiding Retrieval of Digital Images', Tom Morgan, National Portrait Gallery, London
'Challenges in Improving User Success Through Describing and Indexing the Content of Non-still Images in Digital Space', Stuart Jeffrey, Archaeology Data Service, University of York
'Novel Methods for Increasing Access to Visual Digital Information', Kirk Martinez, University of Southampton
'The Problem with Pictures: Use of Visual Metaphors and 'Intelligent' Image Browsing', Mike Pringle, AHDS Visual Arts, University College for the Creative Arts, Farnham
'Technological Issues for Practice-led Research in the Visual Arts', Jonathan Woodham, University of Brighton
'Artist Practitioners and the impact and Use of Digital Imagery and the Internet', Roger Wilson, Chelsea College of Art and Design
'New Ways of Thinking About Imagery in the Digital Era', Charlie Gere, Lancaster University
Rapporteur's Response, Chris Bailey, Leeds Metropolitan University

Seth Denbo and **Torsten Reimer**

ADVANCED TECHNOLOGIES FOR COLLABORATIVE PERFORMANCE

Organized by **Alan Blackwell**, Crucible Centre for Research in Interdisciplinary Design, **Nick Collins**, Department of Informatics, University of Sussex, **Ian Cross**, Cambridge University Centre for Music and Science, **Julio D'Escrivan** and **Richard Hoadley** of Anglia Ruskin University. Held at CRASSH, University of Cambridge, and Anglia Ruskin University, 20 - 21 December 2006.
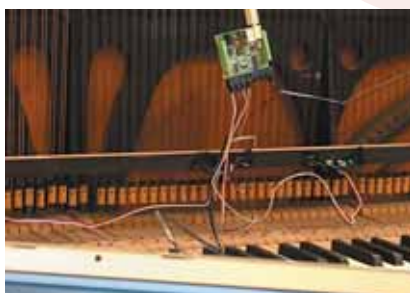
The combination of participants' creative and technical skills inspired exciting new performances at the workshop. Images © 2006 Cambridge Performance Technology Workshop.

Collaboration between traditional musicians and technologists leads to fascinating new ways of thinking and can unleash unexpected creativity. The aim of this workshop was to train practice-based researchers in the performing arts to make better use of ICT technologies that support live collaboration in performance situations. The event allowed performers to utilize technologies in performance situations and encouraged interaction and even collaboration between digital specialists and conventional performers.

State-of-the-Art Technology

At the event, performers and programmers used the state-of-the-art music technology teaching facility at Anglia Ruskin University which is equipped with the latest hardware for collaborative performance. This gave participants the opportunity to investigate the collaborative development of new technologies, using existing tools such as Max/MSP, Jitter, and SuperCollider, tactile I/O devices, game controllers, webcams and other sensors.

All the tools that were used had a significant impact on the research questions of the event. The organizers intentionally brought together participants with a different range of experience and expertise to share knowledge and develop new technical innovations at the event, with the aim of utilizing existing tools in new ways. This range is reflected in the background information about each participant that is included in the activity report.

Ongoing Collaborations

There were many ideas for future collaborations from promising 'work in progress' which began at the event. The event had a profound impact on participants and inspired new work, some said that it had changed the way they thought about their practice. One year later there was a graduate-training event held at CRASSH in which two of the projects which arose from the initial workshop were presented.

Because the event was so successful, the participant's only criticism as that the workshop was too short. However, as an initial foray into the field, the event proved highly successful and demonstrated the value of practise-based research in live coding and performance, as well as music (and media) technology in general.

Further information

http://www.crassh.cam.ac.uk/events/2007-8/irtnsound.html

Piano without Hammers

Although the event had some surprising outcomes and interactions on the day, creating space in which such surprises could occur was one of the central aims of the workshop – to foster an environment of discovery. On the day, new instruments were invented from existing ones, presenting exciting new opportunities for musicians and technologists alike. For example, a piano without hammers was spontaneously incorporated into the activities and digital tools were used to create a hybrid instrument. Giving a group of technically skilled people the engineering challenge of making the piano 'play' again unleashed a lot of creativity, and it was played in a wholly new way by a pianist.

ANNOTATING IMAGE ARCHIVES TO SUPPORT LITERARY RESEARCH

Organized by **Omer Rana**, School of Computer Science, Cardiff University and **David Skilton**, School of English, Communication and Philosophy, Cardiff University. Held at Cardiff University, 10-11 October 2007.

Illustrations from the DMVI: The Daily Governess from 'The Daily Governess' [a poem], in **London Society**, 1 (June 1862); "There is nothing like iron, Sir; nothing" (OF004) from Anthony Trollope, **Orley Farm** (1862) and An Adventure on a Bridge from 'An Adventure on a Bridge', in **Leisure Hour** (9 August 1862).

Annotating Victorian Illustrations

This workshop was focused on answering questions about the annotation of image content. The Centre for Editorial and Intertextual Research (CEIR) at Cardiff leads an AHRC-funded project to create a Database of Mid-Victorian Wood-Engraved Illustrations (DMVI **http://www.dmvi.cardiff.ac.uk**), which contains over 800 Victorian literary illustrations. Each image in the database contains iconographic annotations, enabling searches to be performed on the pictorial content of the illustrations themselves. Successful iconographic description requires a standardized vocabulary and a set of keywords which allow the database user to consistently locate illustrations matching their search terms.

The workshop brought together researchers within literary studies (particularly those focusing on nineteenth-century literature and illustrations), and members of the computer science community focusing on Semantic Web and Content-Based Image Retrieval (CBIR) technologies to better understand:

- how individuals from different user groups (historians, cultural critics, journalists, researchers in literature and arts, social scientists) interpret illustrations;
- whether common themes could be found in the use of such systems by these individuals, and whether such analysis of use can be used to provide a recommendation system.

Web 2.0

There was a lot of discussion about how to use Web 2.0 type innovations to create and develop social networking for the annotation of images, which could then use ICT technology further to integrate the responses of the participants (through "collaborative tagging" of content) and identify commonality between annotations. All of this is very much on the boundaries of what is currently possible, and raises interesting challenges for both humanists and computer scientists.

Automated Annotation vs Social Networking

There were two main methodological approaches presented at the workshop. The first was Stefan Rueger's (Imperial College and Open University) research into using computers to annotate images. The process automates the annotation by defining the characteristics of the image, using computer vision-based metrics, and then asking the computer to make comparisons between the initial image and other images. The other approach is that being developed by Kirk Martinez (University of Southampton) whose work is on combining the use of computer-generated annotations with ontologies created by social networks.

New Collaborations

A Methods Network report on the event is available. Some very productive new relationships between computer scientists and arts and humanities scholars came out of the two days. There is ongoing discussion with the Open Grid Forum about contributing case studies which came out of the workshop. Additional workshops have arisen from this initial event, utilizing the report as the basis for planning – one occurred at the Victoria and Albert Museum in December 2007 and another is planned for Cardiff in May 2008. Both of these are about developing further the relationship between the arts and humanities and computing scholars. There are some plans to apply to the AHRC or the EPSRC for funding to further investigate questions about content-based image retrieval.

Guest speakers:

Keynote: Andrew Prescott, Lampeter
Lisa El Refaie, Centre for Language and Communication Research, Cardiff
Stefan Rueger, Imperial College and Open University
Dave de Roure, University of Southampton
Kirk Martinez, University of Southampton
Brian Maidment, University of Salford

CORPUS APPROACHES TO THE LANGUAGE OF LITERATURE

Organized by **Martin Wynne**, **Oxford Text Archive.** Held at Oxford University Computing Services, 17-18 May 2006.

Corpus Linguistics for Literary Critics

Corpus Approaches to the Language of Literature was the first in the series of advanced workshops funded and facilitated by the Methods Network. The workshop was an opportunity to disseminate and discuss examples of successful research which has shed new light on literary texts through the techniques of corpus linguistics. The event gathered more than twenty participants from different geographical areas, research backgrounds and subject fields to attend a series of presentations and practical sessions. The workshop built on networks and discussions held at the Corpus Linguistics 2005 conference in Birmingham and subsequent Poetics and Linguistics Association (PALA) conferences. These discussions resulted in a clear feeling that while there was recognition of the potential usefulness of corpora, there are practical barriers to progress. It was decided that it would be useful to run an event which would provide literary scholars with a practical introduction to the techniques and methods of corpus linguistics.

Analysing Digital Classics

The target audience was primarily stylisticians and literary critics with an interest in, but little experience of using, digital tools in their textual analysis of linguistic and literary corpora. The practical sessions gave participants hands-on experience of working with electronic texts and corpora. Resources used included the British National Corpus and texts from the Oxford Text Archive, including electronic versions of Jane Austen, Charles Dickens and Shakespeare. The participants were given the opportunity to work with Wordsmith Tools to investigate Shakespeare and find and analyse collocations. Without Methods Network funding it would have been impossible to develop these

exercises, which are all now publicly available online. This event led directly to a one-day pre-conference workshop at the PALA conference in Joensuu in Finland, at which more PALA members and other international scholars were able to participate.

New Scholarly Networks

There is a growing network of scholars interested in using corpora to study literature. The workshop was the founding event for a PALA special interest group on corpus stylistics, and a short report was published in the Parlance, the PALA newsletter. Most of the activities in this area of corpora and literature have come either directly out of the workshop or are a result of the network established by workshop attendees. Thus, the workshop has played a crucial role in building a new community of scholars.

A New Kind of Dictionary

While the field of corpus linguistics has demonstrated that significant gains are to be had from applying ICT to the analysis of language, literary scholars have been slower to use these new techniques. Nevertheless it is clear that is possible to ask new kinds of questions because of the innovative ways texts can be studied through the use of digital tools and electronic texts. New modes of evaluation of language become possible and complex analyses which were previously impossible can be undertaken. For example, Jonathan Culpepper of Lancaster University who presented at the workshop, used illustrations from a number of case studies, to show how he used familiar notions in corpus linguistics, such as collocation, cluster or multiword unit, keyword and grammatical and semantic annotation, to examine the language of Shakespeare. This work will ultimately lead to a new kind of Shakespeare dictionary based on the usage of words.

A dictionary entry might be as follows (All = All Shakspeare's plays, T = tragedies, C = comedies, H = histories, M = male speakers, F = female speakers, Pla = other EModE plays, Fic = EModE prose fiction, Tr = EModE trial proceedings, Ha = EModE handbooks in dialogue form, Sc = EModE scholarly works; the figures in brackets are normalised per 100,000 words):

HORRID. Something that is **horrid** causes fear; typically, it refers to supernatural or unnatural acts, sights and sounds. Distribution: All = 16 (1.8); T = 10 (3.9), C = 2 (0.6), H = 4 (1.5); M = 14 (1.9), F = 2 (1.4). Comparisons: Pla = 187 (0.17), Fic = 0, Tr = 0, Ha = 0, Sc = 1 (0.14). EG 'Whose **horrid** Image doth vnfixe my Heire', 'I will meditate the while vpon some **horrid** message for a Challenge'.

An extract from Jonathan Culpepper's dictionary on Shakespeare

Papers and Presentations

'Corpus Linguistics and the Language of Literature', Ylva Berglund and Martin Wynne, Oxford Text Archive

'In Search of a Bad Reference Corpus', Mike Scott, University of Liverpool

'A New Kind of Dictionary for Shakespeare's Plays - an Immodest Proposal', Jonathan Culpeper, Lancaster University

'Corpus Stylistics - Methodology, Theory and Patterns in Literary Texts', Michaela Mahlberg, University of Liverpool

'Collocations, Corpora and Criticism', Bill Louw, University of Zimbabwe

DATA SANS FRONTIÈRES: WEB PORTALS AND THE HISTORIC ENVIRONMENT

Organized by Stuart Jeffrey, Archaeology Data Service (ADS), University of York. Held at the British Museum, 25 May 2007. Co-sponsored by the British Museum.

Unusually for an academic discipline, much core research material in archaeology is curated by bodies outside the higher education sector. Traditionally, accessing these resources for research purposes has been complicated, difficult, or in some cases impossible.

New developments in portal technology have created the opportunity for cross-sectoral (and cross-border) data aggregation. This workgroup took a comprehensive look at exciting new opportunities for disseminating and integrating historic environment data using portal technologies and Web 2.0 approaches. Service oriented architecture was also an important issue during the day.

Combining Local and National Data and Audiences

By bringing together speakers from local and national organizations with academics, this workgroup was able to explore options for cooperation at both national and international levels. The audience and speakers included academic archaeologists; curatorial archaeologists in local and national government; the Royal Commissions in Scotland and Wales; and representatives from the commercial and museum sector.

The aims of the workgroup were:

- To raise awareness of current developments in the online dissemination of historic environment data;
- To set developments in the historic environment sector in a wider national and European information context;
- To raise awareness of current portal and interoperability technologies;
- To create a vision for a way forward for joined up UK historic environment information provision.

A number of digital resources were used as exemplars during the day. Among them were English Heritage's HeritageGateway website and the Archaeo-Browser project developed at the ADS. Archaeo-Browser gives a single point of access to data from numerous public and academic agencies in the UK, using an innovative toolkit for 'faceted classification'. Data sources for this project include The National Archives, English Heritage and SCRAN. This demonstrates the complexity and wide range of data available to heritage specialists - and the complexity of combining these resources. In addition, a number of individual academic and curatorial projects were demonstrated.

The event showed that the debate about levels of control and access to data continues . However, it also emphasized that better and deeper data aggregation allows for much better contextualization and development of research. Wide access to data was seen as key to building successful research projects and it was felt important that this was not left for companies alone to

> 'We have to ask ourselves why companies are doing this. These are large commercial corporate organisations and if we do not develop our own modes of access to that content, we will end up in the position where the only way of getting at our own academic data is through a commercial organization that we have no direct control over.'
> **Stuart Jeffrey, Workgroup Organizer**
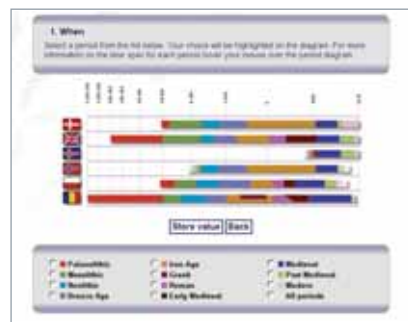
The Arena and HeirPort search portals make use of technologies that allow exciting new opportunities for disseminating and integrating historic environment data.

provide.

Outcomes and the Future

The workgroup meeting allowed participants to share research findings from various heritage projects and also showed that there was strong interest from the museum sector in the issues discussed. A presentation on the 'European Dimension' by David Dawson from the Museums, Libraries and Archives Council demonstrated the opportunities for future collaboration on a European level.

The event also encouraged new research and led directly to the EU funded project 'Archaeology in Contemporary Europe', which aims to construct a UDDI for the archaeological community. 'Data Sans Frontières' was a precursor to identifying the need for such a Universal Data Description Discovery and Integration registry system (UDDI) and for obtaining a consensus so that the funding could be sought to create it.

A report about the day is available from the Methods Network website together with the presentations.

DEVELOPMENT OF SKILLS IN ADVANCED TEXT ENCODING WITH TEI P5

Organized by Lou Burnard, James Cummings and **Sebastian Rahtz** for the Text Encoding Initiative.
Held at Oxford University Computing Services, 18 - 20 September 2006.

It is widely recognized that text encoding - that is, the representation of textual structures and interpretation in a portable and long lasting digital form - constitutes an essential component in the skills portfolio of today's researcher in the arts and the humanities. Yet there is surprisingly little consensus about the best way of teaching this technique, or about how best to tailor training in it to the widely different communities needing to take advantage of it. While the Text Encoding Initiative (TEI) has focussed on standards relatively little emphasis had been placed upon training scholars in its use. The perceived need for better training led to this three-day exploratory workshop on Advanced Text Encoding Techniques at Oxford University Computing Services. The goal was to investigate effective ways of training arts and humanities Researchers in advanced encoding techniques, with a view to identification of both appropriate training methodologies and suitable teaching resources for tailored courses about the TEI.

Strands of Focus

Four strands ran through the three day event:

1. current TEI teaching practice
2. the scope and content of the TEI recommendations
3. supporting technologies for exploiting TEI encoded material
4. the development of course material appropriate to TEI training modules or courses of different kinds.

Each day began with a guest speaker – including experts from the United States and Germany – however, the bulk of the workshop was devoted to exploratory practical work in small groups. On the first day participants were invited to devise a one-day introductory

The homepage of the TEI Workshop Wiki http://wiki.oucs.ox.ac.uk/tei/

workshop on the TEI, and rapidly reached consensus on basic approaches and appropriate content. On the second and third day, each of the five groups worked on defining contents, outcomes, and appropriate materials for a range of different teaching scenarios. For each scenario, the groups were asked to design the course programme and timetable, create a course synopsis, a set of learning aims and expected outcomes, and a detailed list of secondary materials including a bibliography. In a final light-hearted session, a spokesperson from each group tried to persuade a skeptical band of funders to finance their proposed approach.

Workshop Wiki

In addition to the production of a range of highly useful teaching tools and a report written by the organizers, the workshop had several positive outcomes. As a result of this workshop teaching has been put on the agenda of the parent organization of the TEI, so where it had previously been neglected, it is now a priority. A highly detailed and comprehensive Wiki was set up to record and make accessible all of the materials from the event. Subsequent workshops have been held which utilized the material. There is also a workshop

website which includes a wide range of materials from the three-day event.
Electronic texts are widely recognized as having a key role to play in the work done by many humanists and social scientists, a role which will only grow as time goes on. Standards in text encoding are of course crucial to the creation, maintenance and utility of electronic texts. The TEI is one of the top internationally recognized standards, so dissemination and training in the TEI is crucial to its value for scholars in the humanities and social sciences. This workshop addressed that issue head-on, and came up with real solutions.

Guest Lectures

'"Teach a man to fish…": Introducing the TEI to Humanists', Julia Flanders, Scholarly Technology Group, Brown University

'Uncovering the TEI and ODD: A Pedagogical Strip-Tease', Laurent Romary, Max Planck Digital Library, Berlin

'TEI vs the Chalkface: Reflections and Issues in Teaching TEI', Melissa Terras, School of Library, Archive and Information Studies, University College London

DIGITAL RESTORATION FOR DAMAGED DOCUMENTS

Organized by Julia Craig-McFeely, Director and Project Manager, Digital Image Archive of Medieval Music, Department of Music, Royal Holloway. Held at Oxford University Computing Services, 29 June 2006.

The Digital Image Archive of Medieval Music (DIAMM) has pioneered the use of mainstream commercial software to recover damaged and obscured readings from manuscript sources which have been captured by high-resolution digital imaging. This workshop was held in response to demand from scholars internationally to learn the techniques and underlying methods of this process, and aimed to disseminate the skills for digital restoration of high resolution images. The workshop looked at how to obtain archive-quality digital images from libraries, and then focussed on techniques for using Photoshop to manipulate the images. Participants were able to gain hands-on experience of image restoration using exemplars from the DIAMM project.

These techniques were originally developed for the restoration of medieval manuscripts, but can apply to any form of damaged document or image of an object, so could be applied to a range of humanities and arts disciplines. The workshop itself included participants from the fields of early modern literatures, music and art history, medieval music and others.

A digital restoration sample © 2008 DIAMM http://www.diamm.ac.uk

Enhancing the Corpus

It is actually possible in many cases to achieve better restoration results using digital images than the actual documents themselves, so these techniques represent a significant step forward. Digital restoration also has the significant advantage of not being invasive – results can be obtained without any impact on the original manuscript.

The use of new technology to return documents to legibility that had previously been unreadable is having a major impact on research as these texts now become part of the corpus, where previously they had been omitted. In addition, old material can be reappraised where portions of it may have not been readable previously. The field is leading to changes in the way scholars are approaching manuscript study within subject areas, but also changes are occurring in interdisciplinary work with the increased availability of digital images. For example, a scholar interested in medieval manuscript illuminations who understands digital imaging will now find it much easier to study these across genres.

Workbook

The workshop was built around a detailed workbook which guided the participants through the exercises and served as the manual for the day. The workbook has general technical information about best practice imaging techniques, and then goes on to cover the methods and tools described and demonstrated at the workshop. Participants were able to take this away to use as a reference tool for future work. The workbook, which can stand alone, is now freely available from the Methods Network website.

Programme highlights

Sessions at the workshop included:

What to ask for: Specifications Resolution; type of image required to do digital restoration; how to get this from the library; how to evaluate images you have been sent; workstation and monitor specs; checking for colourblindness; customizing workspace and optimising Photoshop for restoration work; shortcuts in Photoshop; general overview of essential tools; basic skills.

Restoration 1: Evaluating the image; pixel selection; layers; level adjust; colour fills; filters; basic tool usage; common errors and problems

Problem image(s) 1: suggested techniques for enhancement; attendees get their hands on their first image and see what they can do. Individual tuition from course tutors

Restoration 2: layer mode; using levels to assess image illumination problems and white and black points; dragging layers between images; grouping images; unsharp masking; Channels; exclusion or inclusion; temporary threshold adjustment layer

Problem image(s) 2 –suggested techniques for enhancement; individual tuition from course tutors

DIGITAL VISIBILITY: A WORKSHOP ON NEGLECTED DIGITAL RESOURCES

Organized by **Claire Warwick** and **Melissa Terras** of the School of Library, Archive and Information Studies at University College London. Held at the Maughan Library, King's College London, 26 April 2006. Co-sponsored by the LAIRAH project.

Creating digital resources is now an ever increasing aspect of research projects across all arts and humanities disciplines. The LAIRAH project was funded by the AHRC ICT Strategy Programme to create a survey of digital resource usage in the humanities and to study the characteristics that might predispose a project for sustained use. For the workshop, LAIRAH and the Methods Network invited academics from different arts and humanities disciplines to get user feedback on the use of digital resources.

Learning from the Users

The workshop brought together researchers to discuss, in the way of a focus group, digital resources and to find answers to the following questions:

- To gather user feedback on a range of digital resources.
- Find out if users could distinguish between those that are repeatedly accessed and those that appear to be neglected.
- Find out if users could suggest factors that might predispose a resource to be used or neglected.

The participants were mostly chosen from those taking part in a previous survey run by LAIRAH. The group was cross-disciplinary in nature and encompassed fields such as history, classics and linguistics. They discussed a variety of resources, mainly from the AHDS catalogue, that demonstrated how valuable digital materials and methods now are in arts and humanities research: the discussion ranged from 'Art and Industry in the Eighteenth Century' to 'Exeter Cathedral Keystones and Carvings', 'GIS of the ancient Parishes of England and Wales, 1500-1850', 'Imperial War Museum concise art collection' and 'Designing Shakespeare'.

A Demanding Audience

A surprising outcome of these discussions was that participants felt nervous commenting on digital resources and reluctant to pass judgement on others' digital work, even though they do so constantly with non-digital research outputs. At the same time, humanities researchers proved to be up to speed with developments in the commercial sector, and were quick to disregard resources because of design that was, or appeared, out of date. There also is a perception that digital resources are worth less if they do not reach a large audience; the simple fact of being online meant that criteria were applied that were not used with printed publications.

> 'People expect digital resources to be like Facebook or MySpace and to have ten million users. It is not seen as appropriate to spend £100,000 making a website which is used by one person once a week, whereas it is okay to spend six years of your time writing a book that is read by two people.' (Melissa Terras, workshop organizer)

Humanities scholars were seen as a particularly demanding audience. User interface design and general usability were identified as crucial, as was proper documentation of a resource (purpose, origin of data used etc.). Well used projects often were those that did user testing and creators of digital resources were advised to consult with experts and, more generally, to be aware of these issues.

In the Context of LAIRAH

Findings from the workshop were included in LAIRAH's substantial project report; a summary report has been made available via the Methods Network website. They also informed several articles that were, or are, to be published as part of the project's activities. The workshop was helpful for the organizers in getting new input and exchanging information with others, which was useful in the development of a follow-up application for a project that is currently pending. This three year project will build on the work of LAIRAH and expand it.

Further Information

http://www.ucl.ac.uk/slais/research/circah/lairah/

DREAM MACHINES: THE INTERSECTION OF LIVE ARTS PRACTICES AND GAME ENGINE TECHNOLOGIES

Organized by Jonathan Dovey, Department of Drama: Theatre, Film, Television, Bristol University. Held at the Watershed Media Centre, Bristol, 21-22 January 2008.

Game engines can be used to create worlds, situations, objects and textures with a resolution in many cases comparable to CGI animations, but using a fraction of the processing power and computing speed. Dream Machines explored how these technologies can be put to use for artistic practice and research.

The workshop was a collaboration between the Department of Drama and the Institute for Learning and Research Technology at the University of Bristol. It combined seminar presentations with hands-on activities using practice-based research methods. The work investigated at the event was at the intersection of live creative practice (dance, drama, and music) and online virtual worlds such as Second Life and and other game related technologies such as Machinima (films created using game engine software).

Questions about Live Performance and Game Environments

To explore the relationships between Machinima and other game technologies and live performance participants addressed the following questions:

- What are the effects of introducing live performance into a game environment and vice versa?
- What is the process involved in doing live in-game theatre through avatar puppetry?
- What is the process involved in doing distributed performance using multiple participants?
- How do game based performance themes adapt themselves to related human thematics such as identity, isolation, intimacy or inadequacy in the face of technology?
- How does a game experience relate to a live experience in an

Workshop participants arrange a blue screen tableaux inserting real human bodies into a post battle virtual mis en scene' Photographs by Martin Reiser.

art space or event space, and what opportunities and drawbacks of these experiences will be presented by their combination?

The varied backgrounds of the participants demonstrates that there is interest in these questions from many different areas. Participants included technologists working in live and Machinima art and designers from interface design, but also representatives of various performance disciplines engaging with virtual spaces (including dance, theatre and sound).

The event took place at the Watershed Media Centre in Bristol where an environment was set up that allowed the participants to explore their research questions: networked computers with game engines and access to Second Life were connected with a bluescreen video environment to put bodies into virtual environments while various I/O devices such as Wii gaming controllers were used to control avatars. Participants used these resources to, among other things, develop a short theatre play set in Second Life, for which voice performers and puppeteers worked together.

The whole event was documented in blog entries and video recordings were made to be disseminated through the University of Bristol's Theatre Collection, YouTube and www.arts-humanities.net. The event also generated resources such as scripting examples for the Wii avatar controller and some technical outputs, for example set ups. A full report is available from the Methods Network website.

Questions for New Research

There were a large number of surprising outcomes. For instance, bluescreen technology as a live environment was much more limiting than expected. It was felt that this technology suits the carefully controlled usage made by the film and television industry, but did not fit as well into a live context. This may be because there is a problematic level of precision required to make it work well. Participants enjoyed the novelty of having a live body and a virtual body cohabiting the same space, but some performers were not comfortable with the application of game I/O devices and worlds to their artistic practice. This area will need further research to provide an environment that will suit different artistic approaches to virtual worlds. Another issue that arose concerned the use of public space in Second Life for performances. Participants questioned the ethics of performing in networked virtual worlds and the effects on other inhabitants of these worlds that become part of the performance or at least occupy the same space. They also considered possible connections between these public spaces and street theatre.

These and other questions will be followed up between the participants and it is hoped that this will lead to the generation of viable research projects based on the results of the event. A potential international collaboration on an augmented reality project is currently being explored.

EPISTEMIC NETWORKS AND GRID + WEB 2.0 FOR ARTS AND HUMANITIES

Organized by Dolores Iorizzo, Internet Centre, Imperial College London. Held at the Internet Centre, Imperial College London, 30-31 January 2008.

Hundreds of thousands of new digital objects are placed in repositories and on the web everyday. These objects support and enable research not only in science, but in medicine, education, culture and government. With this increasing amount of digital data, it is getting ever more important to build interoperable infrastructures and web-services that will allow for the exploration, data-mining, semantic integration and experimentation of resources on a large scale.

Putting GRID and Web 2.0 to the Service of Arts and Humanities

Coupling GRID with Web 2.0 technologies allows for the development of a more lightweight service-oriented architecture that can adapt readily to user needs. The workshop explored the extent to which such technologies could be put to the service of the arts and humanities. This was not only approached from the technical side, but also with a view that it was necessary to develop scholarly communities around repositories and services and to think about the research questions the tools would be used for.

The workshop built on previous activities at Imperial College including a conference on Semantic Interoperability for e-Research. Several related follow-up events have taken place, for instance a seminar on 'Semantic Interoperability in Medicine, the Sciences, and Cultural Heritage'. Another meeting in March 2008 looked at the technologies that researchers will need to work with the outputs of the mass digitization projects undertaken by companies such as Google and Microsoft.

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Infrastructure and Building Bridges

Epistemic Networks brought together national and international experts and allowed them to make new contacts. Participants came from the library sector, computer science and various arts and humanities disciplines and included scientists, metadata and database specialists as well as graduate students from computer science. This interdisciplinary group also combined different perspectives from within disciplines: some of the participants were more interested in the internet as an object of research whereas others took an active role in actually building the infrastructure.

The research presented and discussed during the two days can only be imagined in a cross-disciplinary way. It relies on building connections between different institutions and countries to integrate large and disparate data. Such issues were highlighted in all presentations, for instance in relation to the Text Grid project that cross-links computer science research questions about how to access complex datasets with text-based research in the humanities. Discussions also focused on interoperability protocols and the digital infrastructure that will allow for research using arts and humanities resources on a large scale.

Combining Old and New Knowledge

It was emphasized that new knowledge is often created by combining old knowledge in new ways - exactly what the combination of GRID and Web 2.0 technologies can enable researchers to do. It became clear that museums, libraries and archives need to integrate their resources better so that researchers can combine data

from different sources and institutions and work with them. Access to English Heritage databases, for instance, allows the user to identify the origin of an object and to learn more about similar objects. Combining this with data from The National Archives such as place names and census data will lead to new research questions.

A concrete example of a project that integrates different types of data is the Virtual Research Environment for Political Discourse 1500-1800. This project combines multiple resources, textual and visual, to facilitate research in the development of ideas and political discourse.

It was evident at the event that developing the digital infrastructure is a complex project that should only be undertaken with long term planning and sufficient funding from research councils in different disciplines. It was agreed that higher education institutions alone do not have the resources for this.

A Roadmap for Future Research

A detailed report, available from the Methods Network website, reflects on the broader issues and captures the various session topics, including documentation and analysis of the comments and discussion for each session. This report is accompanied by a practice-driven roadmap for future research. The Internet Centre will also set up a website with on-line papers/presentations and wiki for the workshop.

'Most arts and humanities departments are lucky if they have a unit that will help them to set up their email.' Dolores Iorizzo, Workshop Organizer

FILM, VISUALIZATION, NARRATIVE

Organized by Adam Ganz, Royal Holloway, University of London. Held at Royal Holloway, University of London, 17 Nov 2006. Co-sponsored by London Centre for Arts and Cultural Enterprise (LCACE).

This seminar brought together practitioners and theoreticians from information design, filmmaking and computing. The presentations looked at current and possible future applications of visualization techniques to the writing, realizing and editing of films. They also considered the influence of interface design and visualization on film practice and aesthetics. This included the effect of non-linear editing and effects and the introduction of the timeline as a dominant metaphor for visualization in film. Contributions were encouraged from disciplines where visualization has transformed the understanding of the process, or enabled a different perception of narrative.

A still from 'Swim' a design documentary by Bas Raijmakers, who took part in the seminar, that explores the use of smart textiles for swimming.

Key Questions in Visualization Theory

In his introduction to the day, Adam Ganz, workshop organizer, posed three central questions which were the focus of the event:

1. Why is visualization convincing?
2. What do formal visual elements mean in visualization?
3. What do film makers learn from this and what do data originators learn from this?

Communities of practice for whom this event asked relevant questions include computer games production and design, film making, new media, architecture, psychology, computer science, human anatomy, product design, town planning, and public health, among others. The event itself was a cross-disciplinary collaboration, looking at the topic of visualization in film from different perspectives and approaches. This has encouraged networking both within Royal Holloway and across the wider community of interested scholars, leading to plans for an ongoing seminar and contributing to the forming of a new interdisciplinary community.

Collaborations, Interactions and Outcomes

There is a wide range of ongoing collaborations and interactions which arose from the event including:
• A detailed report on the event available online;
• Training materials on visualizations of screenplays;
• Published paper co-authored by Fionn Murtagh, (Professor of Computing Science at Royal Holloway), Adam Ganz and Stuart Mckie, looking at visualization techniques applied to screenplays;
• Development of good links with foreign institutions via participants;
• An ongoing Grant application for about £250,000 as well as some smaller grants, specifically to look at visualization in relation to screen writing to LCACE, to hold another seminar day, and also to do some programming to take forward discussions which took place at the seminar;
• A special issue of the online journal Reconstruction: Studies in Contemporary Culture to be published later in 2008, on the theme of visualization and narrative.

Resources

Presenters demonstrated a number of tools and digital resources including Korsakow, a free software template available for making online, interactive, associative documentaries. This was demonstrated by Florian Thalhofer (www.korsakow.com). Live web resources included a short film called 'Visualization of the Cell', produced by Harvard University, available online www.infosthetics.com. Martin Kreyssig showed a work-in-progress film exploring ways of organizing information. More about Kreyssig's work is available at www.onnoon.net. Various other websites were demonstrated which provide structuring, storyboarding and script analysis tools such as www.mindola.com, www.screenplay.com and www.sophocles.net.

FROM ABSTRACT DATA MAPPING TO 3D PHOTOREALISM: UNDERSTANDING EMERGING INTERSECTIONS IN VISUALIZATION PRACTICES AND TECHNIQUES

Organized by Julie Tolmie, 3D VisA, Centre for Computing in the Humanities, King's College London and Roy Kalawsky, VizNET, Loughborough University. Held at the Birmingham Institute of Art and Design, 19 June 2007.

Researchers in arts and humanities, social sciences, scientific and engineering communities are generating ever increasing amounts of complex data. The analysis and presentation of this data, often involving real-time collaboration, relies increasingly on visualization techniques and environments. Advances in technology have led to the emergence of discipline specific methodologies or dedicated software. This has at times posed questions about their level of interoperability or fitness for use by other communities.

This is changing; models and methodologies now tend to span multiple visualization techniques and environments. The development of these intersections bodes well for reuse of resources, training and collaboration in the wider visualization community. The meaning of the term 'visualization', however, varies widely between different disciplines. Interoperability and strategic approaches to tools development can be also limited by research culture and focus. Providing introductions to, and overviews of, different areas of visualization to a cross-domain audience is therefore quite a challenging task.

Following-up on VizNET

The VizNET 2007 Workshop, held April 2007 in Leicestershire, began this process. This follow-up workshop brought together the presenters from VizNET 2007 along with experts in visualization in science and engineering and arts and humanities to draft cross-domain orientation materials in visualization topics.

The cross-disciplinary group consisted of representatives from fields such as history; archaeology;

> 'The Methods Network has been instrumental in allowing us to develop the conversations and to create the community that will go forward – it has already provided the seed.' Julie Tolmie, Workshop

visual arts; games development and design; music; computer science; and software development. This interdisciplinarity led to fruitful discussions and helped to build links, for instance between the Serious Games Institute (SGI) and VizNET. These two groups are now planning a cross-domain event for 2009. The discussions and questions emerging from this workshop have also fed into the programme for the VizNET conference in May 2008.

During the event, participants looked at a wide range of tools and methods for visualization, including: data and scientific visualization; data flow models; user generated content mapping; 3D modelling; game engines; visual arts techniques; Second Life; Web 2.0 and e-Science and the Grid.

There were sixteen diagrammatic presentations in the morning session with smaller and more focused group sessions in the afternoon. During the group work, participants began to draft of diagrams or maps for a cross-domain orientation and introduction to visualization. These will be disseminated as posters and flyers at workshops and conferences and in future may be used as the basis for the development of online visualization orientation materials.

Synthesizing Cross-Disciplinary Knowledge

The workshop report synthesizes the new knowledge and experience gained by bringing together the arts

The diagram draws a cross-domain path in which overlapping ideas or topics link each slide to the next. Diagrams created by Julie Tolmie, King's College London

and humanities and science and engineering groups. This report, together with materials from the group sessions such as papers and diagrams, is available online. An index of over 5,000 terms to help aid navigation and understanding has been created. It was used in the analysis of the event and is also intended as a prototype for a publishable resource. Subsequent analysis has identified areas of overlap in terminology: for example between different researchers' use of 'interpretation' and different researchers' use of 'interaction'.

Julie Tolmie, co-organizer of the workshop, concluded that differences between individuals in the arts and humanities and engineering and sciences are greater than between the disciplines. Approaches to collaboration at the workshop depended heavily on the individuals involved: for some there was opposition to the shift in disciplinary boundaries while others were very open to working across traditional divides. e-Science was identified as a strongly cross-disciplinary field in which participants have already moved beyond discussing their differences.

Further Information and Workshop Materials

http://www.viznet.ac.uk/intersecti

HISTORICAL TEXT MINING

Organized by Paul Rayson, Lancaster University and Dawn Archer, University of Central Lancashire. Held at Lancaster University, 20-21 July 2006.

The written word is one of the most important sources in historical research. With the increasing number of digitization projects, more and more digital text is available to researchers. This two day workshop focused on the tools and methods that help them to analyse texts in new ways.

Connecting Communities Through Research Methods

One of the central intentions of the workshop was to establish a network of scholars from the fields of text mining; e-Science; corpus development and annotation; languages; and linguistics. It was felt that a discussion between these disciplines relating to the effective text mining of historical data was long overdue, especially in view of the rapid growth in historical digital resources such as the Open Content Alliance, Google Print and Early English Books Online.

The workshop aimed to define the relationship between the text mining and e-Science community, who are often involved in applying basic techniques to large scale datasets, and the corpus linguistic community, who tend to apply linguistic analysis and annotation techniques to relatively small datasets.

The workshop's aims were:
- to raise awareness of the various techniques utilized and/or tools developed within the various fields;
- to make scholars who work with historical data aware of existing text mining techniques;
- to familiarize such scholars with the use of these techniques and tools, by means of a series of tutorial sessions (GATE, WordSmith, VARD, VIEW, Wmatrix);
- to investigate the problems of applying some 'modern' large-scale corpus annotation and analysis techniques to historical data;

- to enable a roundtable discussion, with the aim of determining what needs to be done to improve historical text mining and to identify possible future workshops and collaborative projects

One of the tools demonstrated, the VARD (Variant Detector) presently 'matches' spelling variants to their 'normalized' equivalents using a search and replace programme and a list of terms. This is being extended so that variants may be detected and 'normalized' automatically. The VARD will enable historical linguists to undertake an empirical exploration of variation across four centuries from 1600 - 1900, but it's usefulness is not limited to the (historical) lexicographer. Indeed, the VARD will facilitate annotation of, and text retrieval from pre-twentieth century corpora, and thus is of potential benefit to the historian, the English scholar, and researchers interested in (historical) dialectology.

The tutorial sessions made use of licensed and freely available material, including: the Lancaster Newsbook Corpus (1640-1661); Nameless Shakespeare; the Lampeter Corpus of English Tracts (1640-1760); Corpus del Español (1200s-1900s); and the EEBO-TCP collection, which contains a significant portion of the Short Title Catalogue of Early English books published between 1473 and 1700.

The Difficulty of Tools Development

The group established through the workshop has since been in contact. Several bids have been developed as a direct result of the event. Getting

> 'Recognizing tools as part of the research process is one the most unique things that the Methods Network did.' Dawn Archer,

The Wmatrix software tool is designed for corpus analysis and comparison.

funding for tools development, however, has proved to be some what difficult as funding bodies tend to focus more on research outputs than on the tools needed for research. A project on semantic annotation was developed by the organizers, working with participants from the workshop. Cooperation between participants has also led to publications, for instance a paper on VARD.

The Benefits of Interdisciplinarity

Another outcome of the workshop was the decision to strengthen contacts between linguists and developers and historians to learn more about their needs and test whether the tools developed could be improved for historical research. This led to the follow-up Methods Network workshop 'Text Mining for Historians', that broadened the group of interested participants. These contacts enabled the organizers to think about their tools in new ways and encouraged further development work at the University of Lancaster. Dawn Archer is now working with a Ph.D. student making use of techniques learned at the event.

A workshop report is available from the Methods Network website and training materials developed through the workshops can be downloaded from the UCREL website.

Further Information

http://ucrel.lancs.ac.uk/events/htm06/

http://www.methodsnetwork.ac.uk/activities/act6.html

IMMERSIVE VISION THEATRES AND STRATEGIES FOR KNOWLEDGE TRANSFER

Organized by Michael Punt, Trans-technology Research, University of Plymouth. Held at University of Plymouth, 13 December 2007.

This workshop considered content design for immersive vision theatres. These theatres are typically planetariums refurbished and modified to accept ±180 degree digital projection. Facilities such as these are increasingly common in the higher education and museum sectors in the UK. The event itself was held in the University of Plymouth's immersive theatre facility (see **www.plymouth.ac.uk/pages/view. asp?page=18227** for more information).

This event was designed to identify:

- Key topics, approaches and discourses that need to be co-ordinated to develop reliable practices and methods of evaluation in designing immersive audio-visual experiences in an educational and research context;
- Existing strategies for the effective use of immersive A/V environments for the transfer of knowledge;
- New areas of research that will contribute toward a deeper understanding of the experience for the participant;
- A rigorous methodology and pedagogical strategies for the efficient use of immersive learning spaces.

Discussions on the day examined tools such as immersive theatre technologies, the use of remote online control between immersive theatre environments, and the techniques of rendering digitally projected material on-the-fly.

Extremely Diverse Constituency

The workshop brought together immersive theatre designers, technical support teams, content providers, software engineers, evaluators, educationalists, and representatives from the following disciplines: library and information science, visual arts, technology, neuroscience, psychology, geology, computer game design, e-health, website content and design, animation, visual arts, photography, environmental and natural sciences, social activism, media studies, and film studies. The event aimed to pool research and discipline specific approaches from this broad spectrum of stakeholders. This led to some very useful interdisciplinary conversations.

Interdisciplinary and International Collaborations

There were a wide range of outcomes of the event: a report of the activities at the event is available on the *Methods Network* website and work is underway on a preliminary bibliography relevant to the specifics of audiovisual immersion.

Interactions between participants on the day led to the development of a viable network for future research collaboration. This has included interdisciplinary links with neuroscientists with a view to developing joint programmes and international links with colleagues from the University of Amsterdam. There are also plans for a future, international event to build upon discussions that took place at the workshop.

The Future

It emerged during the day that remote, on-the-fly rendering of immersive theatre environment-suitable digital projection was possible using low-level computing rather than requiring large expensive systems. This poses new research questions about how to place the ownership of content in the hands of academics to a greater extent without having to mediate material through design teams. There were also useful discussions about how this will enhance research possibilities.

Peter Carrs and Katrina Hazledon present **Uniview** in the immersive vision theatre at the University of Plymouth during the workshop.

INTERACTIVITY IN THE PERFORMANCE OF ELECTROACOUSTIC MUSIC

Organized by **Adrian Moore,** **Department of Music, University of Sheffield.** Held at the Humanities Research Institute, University of Sheffield, 13 December 2007.

Recent changes in both hardware and software have opened up unprecedented opportunities for the electroacoustic composer. On the one hand there is the fully fixed work, while on the other there is 'laptop generation/IRCAM school' work based around instruction sets triggered by intelligent computers or performers working with new interfaces. These developments have enabled the composer and performer of electroacoustic music to take a much more active role in live contexts.

This seminar highlighted this trend, focusing upon a number of issues relevant to electroacoustic music: the composer as performer; performance interfaces; notation; sound diffusion; logistics of performance and publication. The event offered a roundup of current activity in the field including a number of practical examples demonstrated by key practitioners. This lead to an open and highly speculative discussion featuring a real-time presentation of an improvisation and performance tool as part of a small and informal concert.

Tools and Approaches

The seminar looked at different tools and approaches to composing and performing electroacoustic music. The most important digital tools for the performer are the laptop computer and various input devices and controls such as graphic tablets and faders. MaxMSP featured prominently among the software used with other various software and services integrated into performances, for instance Google Earth. There was also discussion of the e-Score real-time score rendering software. During the day many participants tried to circumvent the use of specific tools to ensure that the process of composing and performance is open to those who do not have a deep understanding of programming.

Collaboration and Interactivity

Collaboration was at the heart of many presentations, for instance in real time collaboration between different performers via the internet, the interaction between performer and the now much more active 'audience'. Electroacoustic music encompasses a large field of hybrid art: combining motion tracking, live playback of sounds, video and images with the actual musical performance. The creation of electroacoustic music often requires composers not just to use tools but also to make tools, to explore the integration of other media such as video and to think about improving interfaces. The electroacoustic community in itself has a strongly cross-disciplinary nature.

National and International Networking

The event hosted a discussion that could not have taken place otherwise and brought together a large group of people only a small fraction of which had participated in Methods Network events before this one. The event was also an important chance to present electroacoustic work to an informed audience. The organizer plans to give an expanded version of his paper and performance at the Manhattan School of Music, and SUNY Stony Brook in the USA in April. A detailed report on presentations and discussions from the workshop is available online.

No Electroacoustics Without ICT

This event was an exploration of music creation and a discussion of ways that music can be performed. While ICT is crucial for music in general, without ICT electroacoustic music cannot be imagined. This event demonstrated how electroacoustic music blurs the boundaries between performance and composition and allows more flexibility in creating a live piece of art that otherwise may only have been made available on disc. It was clear from the work presented at the workshop that the best projects combine new approaches with an intimate understanding of past research in diverse areas including technology, music and the broader history of music.

Key Questions:

What does 'live' mean anymore? Who 'makes' the music, the computer or the performer? Where is the human element situated in music made by/through computers and how

Performances and Compositions

The Laptop Orchestra - Ambrose Field

PLOrk laptop orchestra - Dan Trueman

1906 - Ambrose Field

Swarms - Alex Harker

Leave no Trace - Michael Alcorn

Chaconnes - Neal Farwell

Shroud - Neal Farwell

Live performance by Adrian Moore

INTIMACY: ACROSS VISCERAL AND DIGITAL PERFORMANCE

Organized by Maria Chatzichristodoulou [aka Maria X], Goldsmiths College, University of London and Rachel Zerihan, School of Arts, Roehampton University. Held at Goldsmiths College and various locations in London as well as online, 7-9 December 2007. Co-sponsored by Knowledge East, with support from Goldsmiths, University of London.

INTIMACY was a series of events designed to address the notion of 'being intimate' in emergent and hybrid performance practices. The interdisciplinary three day programme was constructed to elicit connectivity, induce interaction and provoke debate between makers and witnesses of works that explicitly address proximity and hybridity in performance.

Instead of focusing on presentations, INTIMACY adopted a more collaborative strategy of workshops, seminars, roundtable discussions and performances. Digital and live art performance practices were used to explore intimate inter-actions and visceral relationships between artist and other. The events afforded contemporary practitioners, theorists and students the opportunity of practical and critical engagement with present coordinates that define these practices.

Hands-on Exploration of Digital Intimacy

INTIMACY allowed for a hands-on exploration of technologies that can enhance 'closeness' for example performances looked at motion capture technologies embedded within costumes and how these can alter, enhance and transform performance practice. Other technologies used in INTIMACY were wireless networks, Web 2.0 sensor technologies and virtual reality, and other digital multi-user environments such as Second Life.

Questions addressed by the events included:

How are bodies represented through technology? Are there similar elements between corporeal and digital performance and how can they be showcased? What is the relationship of the body to self-awareness? Can ICT enhance collaborative practices and intimacy within performance practice? How is desire constructed through representation? How is ICT used in contemporary performance practice? How do digital or networked performances relate to other performance practices? Is it possible to build bridges between corporeal, live art practices (being within the limits of the human body) and digital performance (the absence of the corporeal body, being through an avatar, performing with other people in a telematics context)?

The starting point of INTIMACY was to collapse the dichotomy between performance practice that uses the body and that which uses technology. This made INTIMACY ontologically interdisciplinary: almost every presentation crossed boundaries and disciplines. The board and advisory panel were cross-disciplinary as were the various departments within Goldsmiths who supported and interacted with the event. Audience members and participants also came from varied disciplines: artists, community workers, performers, cultural practitioners, researchers and students from several disciplines (digital art, media, cultural studies, drama, music).

Keeping INTIMACY Alive

INTIMACY led to a wealth of information and documents beyond the activity report that is available from the Methods Network website. Twenty-two hours of footage were recorded during the three days and the Live Art Development Agency has expressed interest in adding footage of the performances to its library collection. Edited sections will be made available on www.arts-humanities.net, Goldsmiths' INTIMACY website and the Knowledge East website. In addition to this, there are papers and reports from seminar leaders, rapporteurs

A performance at the INTIMACY launch: 'Suka Off'

and from the symposium, a substantial proportion of which will be made available online. Negotiations have begun with two publishers to produce a book capturing the experience of the events.

INTIMACY was also successful as a networking event and many participants plan to keep in touch and continue the discussions started at the event. A user group has been set up on www.arts-humanities.net to facilitate this. The website was also used prior to and during the event for online discussions that will continue now the event is finished.

Knowledge East offered two bursaries for student enterprise projects inspired by any of the workshops at the event. Bursaries were awarded in early 2008, and award winners have six months to present the work they have done. This work can be a performance or entrepreneurial project that is connected with the workshop they took part in during INTIMACY.

Maria X plans to reapply to the Arts Council with material generated from the first INTIMACY event and to apply to the AHRC through Goldsmiths and also to Knowledge East.

'The arts-humanities.net website is a very useful resource and a very useful strategy in order to keep discussions going and keep research communities active.'

LARGE SCALE MANUSCRIPT DIGITIZATION

Organized by **Peter Robinson** and **Marilyn Deegan**, **Centre for Computing in the Humanities, King's College London.** Held at King's College London, 5 June 2006.

Advances in digital photographic technology, mass data store and networking capacity have in the last years reached the point where it is now possible to contemplate large scale digital photography of manuscript materials. However, such projects must be rigorously examined, as any programme would need to ensure that it could deliver the quality required while protecting the originals from any degradation through the digitization process. This one-day symposium examined the current situation in the UK with regard to the digitization of historical and literary manuscripts. This seminar invited experts from digitization projects in Europe who have worked on large-scale manuscript digitization initiatives, representatives of UK manuscript holding institutions, interested academic experts and digital humanities specialists to discuss the possibilities and implications of large-scale manuscript digitization. Presentations and discussions examined different methods of how to best achieve a high volume of digitization in a timescale that makes conservation safe, financially viable, and academically useful.

Tools and Processes for Digitization

In terms of tools used for the digitization process, digital photography was the main focus of this workshop. The main issues for any large-scale digitization project are the standards and quality of the images and the speed at which they can be produced. Another issue examined was the cataloguing and metadata that is part of any large digitization project and which must be carried out in conjunction with the digital photography.

Methodologically, discussions were about library process and how this could work in the UK context of nationally-funded public libraries, university libraries, and a range of other types of public and private

A medieval manuscript from the Episcopal and Cathedral Library Cologne digitized as part of the Codices Electronici Ecclesiae Coloniensis (CEEC) project. Members of the CEEC project team participated in the workshop. www.ceec.uni-koeln.de

institutions which hold large collections of manuscripts.

The way forward?

The event aimed to tackle contentious questions head on by bringing together both those committed to digitization as well as skeptics. There are some significant debates and issues to be ironed out before moving forward with mass digitization projects in the UK, but this seminar helped to bring key issues to the fore.

Speakers

Simon Tanner, King's Digital Consultancy Service, King's College London

Julia Craig-McFeely, Digital Archive of Medieval Music Project, Royal Holloway and Oxford University Manfred Thaller, University of Cologne

Torsten Schassan, Herzog August Bibliothek Wolfenbüttel, Fotomarburg and the project CESG

Digitization Leads to Historical Discoveries

There are some very exciting developments in historical and literary studies as the result of digitization of manuscripts. One of the most significant medieval studies discoveries of recent years has been the identification of Chaucer's scribe – Adam Pinkhurst, about whom we now know a great deal – by Professor Linne Mooney. This discovery would have been impossible without access to high quality digital images, which allowed Mooney to identify individual hands that worked on different manuscripts. Mooney's project, presented at the event, is also an example of how digitization can lead to new forms of collaboration. Having the detailed high quality digital images allowed for collaboration with other experts through the sharing of images via e-mail and post, making the discoveries with which she is credited possible.

MAKING 3D VISUAL RESEARCH OUTCOMES TRANSPARENT

Organized by Richard Beacham and Hugh Denard of the King's Visualisation Lab, Kings College London. Held at the British Academy and the Centre for Computing in the Humanities, King's College London, 23-25 February 2006. Co-sponsored by EPOCH, and PIN (Prato, Italy).
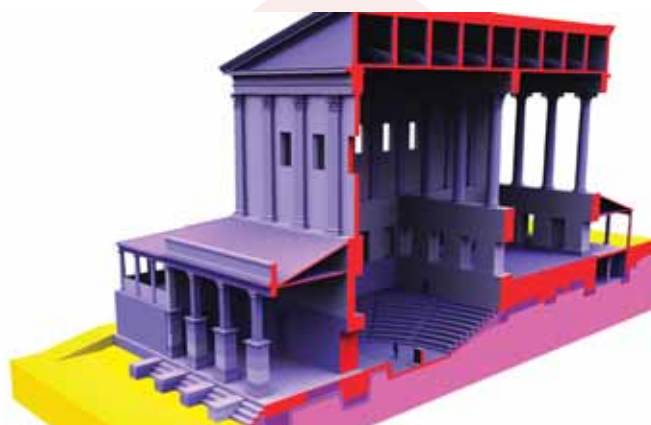
Transparency in 3D Methodologies

3D visualization has obvious applications for the cultural heritage industry, but has at times suffered from a lack of academic respect because of the essential intellectual opacity of the final product. While the visualizations are often intricate and highly evocative they say little about the intellectual work which underpins their creation. This symposium was focused on 3D visualization in the domains of arts, humanities and cultural heritage. It demonstrated the possibility of making previously intellectually opaque work on visualization transparent, allowing it to have greater academic relevance for a range of disciplines.

The papers demonstrated how this problem was being tackled by researchers working in a variety of fields on a range of visualization projects. Speakers included visualization experts, archaeologists, heritage professionals, and theatre historians. The primary focus of the seminar was the methodologies which underpin 3D visualization work.

Hypothetical 3D visualization of the Odeion of Agrippa created by Martin Blazeby, King's Visualization Lab. This 3D model was created from archaeological data including site reports, plans and existing artefacts. As part of emerging 'paradata' principles the methodology and modeling process were recorded as proof of scholarship.

The London Charter

Rather than merely listening to papers and debating the issue the participants at the symposium took action. They drafted a far-reaching document which lays out an international standard for documentation of 3D visualization based cultural heritage projects - The London Charter. This community authored document addresses the problem by setting out a general framework for how to document the decisions which underpin any visualization.

The Italian Ministry of Culture (the department responsible for overseeing all archaeological sites in Italy – half of all cultural heritage sites in Europe) has recently adopted the London Charter as a standard for projects under its auspices. The Charter has been translated into Italian and Japanese. Versions in Polish, Spanish and German are planned for the near future.

A follow-up symposium took place in November in Brighton on the fringes of VAST2007. The event demonstrated the growing awareness of the need for intellectual transparency in 3D visualization; this is in no small part due to the existence of the Charter.

What's next?

One presenter has recently written guidelines for how to implement the Charter – defining a tool which turns the general parameters of the Charter into a workable framework. More of these applications are needed to heighten the Charter's relevance. Grant applications for further development of the Charter are in the pipeline as are discussions with the EU and other cultural heritage bodies.

Broader impact

It has begun to transform the field of visualization, because enhanced intellectual transparency grants 3D visualizations a status as a kind of argument. This status allows it to speak to the core questions being asked within the fields of history, art history, and archaeology, and so gaining a wider audiences than just visualization and ICT specialists.

Speakers

Drew Baker, King's College London

Richard Beacham, King's College London

Kate Devlin, University of Bristol

Maurizio Forte, ITABC - Virtual Heritage Lab

Sorin Hermon, PIN, University of Florence

Franco Niccolucci, PIN, University of Florence

Daniel Pletinckx, Director, Visual Dimension bvba, Belgium

Donald Sanders, Institute for the Visualization of History, Williamstown, MA
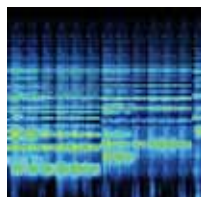
Martin Turner, Manchester Computing, University of Manchester

NEW PROTOCOLS IN ELECTROACOUSTIC MUSIC ANALYSIS

Organized by Leigh Landy, Music, Technology and Innovation Research Centre, De Montfort University. Held at De Montfort University as part of the EMS07 conference, 12 June 2007.

The field of electroacoustic music studies is evolving rapidly. New, highly dynamic approaches to analysis are being developed to aid in the greater understanding of musical content and intention. This event covered a range of ICT-based areas related to the analysis of electroacoustic music or music.

Documentation analysis of Wings of Fire: an electroacoustic music work by Barry Truax

New approaches to analysis include:

- interactive analytical tools;
- use of multimedia / hypermedia in analysis and presentation of analytical results;
- production documentation of non-prescriptive notated composition;
- the intention / reception approach - triangulation;
- computational approaches to electroacoustic music analysis.

Hands-On Access

The workshop was arranged as part of the Electroacoustic Music Studies EMS07 International Conference at De Montfort University. This gave the community an opportunity to be introduced to, and have hands-on access to, some of the protocols being developed. A round-table discussion with invited specialists in each field was held to investigate the state-of-the art and new directions in terms of electroacoustic music analytical methods.

Participants were teachers, higher education specialist students (of electroacoustic music and analysis in general), electroacoustic music specialists and musicologists. They shared tools and methods across their disciplines to develop new and radical ways of doing analytical work. It was felt that a significant part of the value of this kind of event was

to create a means of seeing analysis take place in an interactive manner.

'Impossible to Imagine Without ICT'

The nature of electroacoustic music means that it cannot be imagined without the use of ICT. Digital methods and tools also play a role in its analysis. An analyst may listen to a given recording of an electroacoustic work and manually transcribe what they hear. Nevertheless, a good deal of analysis of this repertoire is dependent on digital technology. For example, transcription can also be created through digital analysis of a work's sound and then having this sonic analytical information translated into readable form.

Digital Tools and Methods for Analysis

Participants discussed the range and scope of digital methods and tools applicable to the field of electroacoustic musical analysis, both in performing the analysis and disseminating results. This included interactive composition and the use of the Sybil software (Synthesis by Interactive Learning), a flexible, extensible software package for the teaching of Music Technology). The discussions ranged from production documentation; evocative transcription and Acousmographe software to the value and potential of perception-based analysis of electroacoustic music and the identification of future research needs. Acousmographe, a form of physics-based, subject-evocative transcription technology for music, can be used both for analysis and the dissemination of

research.

Discovering New Approaches

Participants at the event were computer-literate individuals whose work is rooted both in the body of music and in the digital applications that are related to that music. Even so, a significant amount of those who attended the event, and those whom they informed afterwards, were surprised by some of the digital approaches and methods that were shared. An awareness of new hypermedia forms of publication, for example, does not mean awareness of how composers are self-documenting their work, or vice versa. These discoveries stimulated discussion and seeing examples of good practice was very helpful to attendees.

The workshop led to increased activity on research discussion lists. In combination with the discussions of the day this activity provided input into attendees' strategic plans, research plans and grant applications. A compilation of participants' papers, statements and other documentation are available on the ElectroAcoustic Resource and the Electroacoustic Music Studies Network website. The event organizer is editing a special issue in Organised Sound on electroacoustic music analysis. A report on the workshop is available online that has informed at least one research proposal since it's publication.

Further Information

OPEN SOURCE CRITICAL EDITIONS

Organized by Gabriel Bodard, Centre for Computing in the Humanities, King's College London and **Juan Garcés,** British Library. Held at the Centre for Computing in the Humanities, King's College London, 22 September 2006.

This one-day workshop brought together classical scholars, medievalists and specialists from the digital humanities and the library sector to discuss the scholarly issues that relate to digital editions of classical texts. It explored the possibilities, requirements for and repercussions of a new generation of digital critical editions of Greek and Latin texts that will be made available under an open license.

The topic broached many technological, legal and administrative issues, and participants were selected for their interest and/or expertise in these areas. As an overall background consideration, the group kept in mind the question of how such editions advance classical philology as a whole, both in terms of the internal value to the subject itself, and in terms of outreach, interdisciplinarity and the value of philology to the wider world outside the academy.

During the day, delegates from Germany, the United States and Great Britain delivered eight positioning papers on pertinent topics organized in three sessions. All of the position papers were made available in advance through the Digital Classicist Wiki and were read by delegates; accordingly the presentations on the day were relatively brief summaries, leaving time for considered responses after each paper and then thorough and in-depth discussion from the group as a whole.

Technological, Legal and Administrative Issues

The technological questions discussed at this event included: the status of open critical editions within a repository; the need for and requirements of a registry to bind together and provide referencing mechanisms (Neel Smith presented the Canonical Texts Services

'What was interesting about the meeting was that even the classical scholars that were not experts in computing were able fully to engage with the concepts. To me that demonstrated again that this kind of work is not just of interest to digital humanists but is about advancing scholarship in general.' Gabriel Bodard,

protocols which can serve as a registry for such citations); the authoritative status of this class of edition, whether edited by a single philologist or in collaborative 'Wiki' fashion; the role of e-Science and grid applications in the creation and delivery of the editions.

Legal issues considered largely revolved around the question of copyright: what copyright status should the open source data behind open critical editions have? Attribution is clearly desirable, but the automatic granting of permission to modify and build upon scholarly work is also essential. There are also copyright questions regarding the classical texts upon which such editions are based.

The administrative questions posed included: issues of workflow and collaboration; protocols for publication and reuse of source data: for example, a genealogy of reuse and citation could be generated using ICT. Issues of peer review and both pre- and post-publication validation of scholarship were also addressed by the group.

New Tools for New Projects

The workshop addressed technologies such as versioning tools; registries; e-Science techniques; and XML for encoding editions, and stressed the importance of shared standards for referencing. Several relevant projects

were discussed during the day, for instance the Perseus project, the EpiDoc Guidelines, and the Thesaurus Linguae Graecae.

These and other projects demonstrated that, through the use of ICT, research questions can be broader, the scholarly process sped up and research can be made transparent in away that the sciences have always taken for granted. ICT allows classicists to execute and document research in new ways.

New Dialogues and New Research

An interesting dialogue developed during the event between those who focused upon standards that enabled more sophisticated editing and publishing, and those whose emphasis was upon the sheer scale of a massive collection of digital texts. It was argued that an economy of scale, data mining and other cyberinfrastructure processes would more than compensate for a lack of scholarship in the larger systems. It was universally agreed that scale would have outstanding and paradigm-shifting outcomes for research, but the importance of the ability to include detailed editorial work and critical apparatus within a subset of the larger collection was also stressed.

Although many of the individuals knew each other before they attended the workshop, the event allowed them to focus the nature of their collaborations. At least two refereed papers resulted from the day; the discussions also substantively influenced the application of two successful funding bids to the NEH-JISC trans-Atlantic collaborative research fund. A report on the workshop is available from the Methods Network website.

OPENING THE CREATIVE STUDIO
A series of hybrid activities including a combination of presentations and workshops
Organized by David Gorton, **Royal Academy of Music.** Held at the Royal Academy of Music on four separate days between 10 September and 30 November 2007.

This series of events spread throughout the Autumn 2007 term at the Royal Academy of Music brought together musicians (including composers, performers and improvisers); with musicologists, film scholars, art historians, computer scientists and microbiologists to take stock, explore and reflect on design and development and creative application of technology in musical practice.

Presentations and workshops explored and reflected upon the design, development, and creative application of new technology in the musical practices of performance and composition. The four-day events series took themes from the Royal Academy of Music's research network Modelling Creativity in Music and presented a number of current collaborative activities as case studies that acted as the focus for debate and critical reflection upon the relationships between musical and technological innovation.

Each of the four events had a different focus and the range of tools and methodologies varied with the themes which were under consideration. Tools examined at the events included software that would enable music to be synchronized with animation, 'SoundSpotter' – software developed by Michael Casey of Goldsmith's College that extends musical instruments but also operates autonomously, and 'RAMline', a 'multidimensional index of music and musicians, linked to local digitized archives of other online resources, such as manuscript sources, published editions, live performances, recordings, musical criticism and comments.'

Performances at the Opening the Creative Studio 2 © Royal Academy of Music.

Unexpected Collaborations: The Sounds of Bacteria

Cross-disciplinary collaborations were at the heart of these events with interactions between musicians and visual artists, and musicians and computer scientists. One event featured groundbreaking work in which composer Milton Mermikides, worked closely with microbiologist Simon Park (Surrey University) in the use of digital tools to create a soundscape based upon the growth of microbacteria. This was then placed with high definition images of the bacteria themselves as part of an art exhibition.

Original Performances

A detailed report on the events is available online. Programmes for each event are available on the Methods Network website. Audio recordings of performances and videos of the presentations will be available on the RAM website. Original compositions, improvisations, and performances were another tangible outcome of this series of groundbreaking events.

Events

12 October - **Opening the Creative Studio 1** - Simon Shaw-Miller (Academy Honorary Research Fellow and Birkbeck College) and Mike Allen (Birkbeck College) discussed the interactions between music and visual media and explored the creation of new audio-visual art forms. The day concluded with the screening of collaborative projects by students at the Academy, Bristol

School of Animation, and Leeds Metropolitan University, presented by Philip Cashian.

2 November - **Opening the Creative Studio 2** - brought together composers, performers, and electronics experts to question the relationships between performers and instruments. Contributors included Neil Heyde, David Gorton, Milton Mermikides, Michael Casey (Goldsmiths), and Paul Archbold (Kingston).

9 November - **Opening the Creative Studio 3** - focused on digital resources that allow musicians to create their own personal trace through sources and events including work by the Intelligent Sound and Music Systems Group (Goldsmiths College) and the RAM's innovative 'RAMline' online musical archive.

23 November - **Opening the Creative Studio 4** - Geraint Wiggins (Goldsmith's College), Milton Mermikides, and Simon Shaw-Miller (RAM) explored the questions raised from investigating creative translations between music and scientifically derived data. The day concluded with a roundtable discussion, hosted in association with the Institute of Musical Research, summarizing the issues raised throughout the series.

Further Information

http://www.ram.ac.uk/facilitiesandcollections/Research/Modelling+creativity

PERFORMING SPACE

Organized by Frank Abbott, School of Art and Design, Nottingham Trent University. Held at Nottingham Trent University, 22 February 2008.

New types of communication networks, based on wireless interactive ICT technology, are transforming our understanding of space. These networks are increasingly being explored in live media art projects as well as researched by academics of different disciplines.

This workshop brought together a cross-disciplinary group of artists and researchers to examine how the common ground between these disciplines can be developed through examining wireless network strategies borrowed from the work of artists; and conversely how the development of research, particularly in the areas of geography and architecture, can inform the artists' research and development.

Networking over Networks

The workshop was meant as a first step to building a cross-disciplinary network, reflecting different debates and approaches, that will then be able to develop concrete projects later on. The workshop was originally intended to have a stronger practical component, but this could not happen as the Radiator Festival it was meant to be a part of did not take place.

A cross-disciplinary approach was at the heart of this event and the agenda could not be imagined in any other way.

> **'The ICT Methods Network was one of the few places where we could see the event supported because of its interdisciplinary nature.' Frank Abbott, Workshop Organizer**

The largest proportion of participants came from visual arts and creative media, with a strong interest in theory. Also present were architects,

Frank Abbott **From Here To The End Of My Garden**, 2006 Photo: Karen Fraser, courtesy of Trampoline

geographers, performance artists and people with a background in tourism studies, heritage and urban studies. The discussions and presentation helped these communities to discover shared interests in how space is transformed through ICT.

Together, they looked at the ways a range of locative technologies change art in public space – among them wireless communication devices, including handheld devices, and GPS. The work of several artist groups and centres was presented and several festivals (future and past) were discussed. The event was framed by a poster session.

Participants commented on the usefulness of the cross-disciplinary approach taken by the organizer and felt the event was particularly useful for making new contacts. Although the event only took place a short while before this article was written, it has already encouraged specific ideas and/or potential collaborations to be discussed in relation to future events such as Urban Screens Melbourne 08; Lift Performance Space; the Radiator Festival; Dislocate 08 in Tokyo.

The whole event was recorded on digital video. These recordings will be made available via www.arts-humanities.net. They will form part of a user group set up on this community site to facilitate an ongoing discussion among participants and a wider audience.

Sarah Thom / Elyce Semenec. **Livestreamdream**, 2004. Photo: courtesy of Trampoline

Rethinking Data Gathering

Participants felt it was important to report back to subject disciplines on discussions that developed during the event so researchers might rethink the way they operate. The event also identified potential new approaches to collaborative work between artists and researchers. Some of the presentations looked at how 'invisible data' could be made visible by rethinking the knowledge gathering process (for example participatory observers, questionnaires) in relation to new networks that people inhabit. Steve Benford presented his work at the Mixed Reality Lab at Nottingham University which combines artistic performance and games with network technologies to create maps of GPS, wireless and satellite coverage of cities and to explore the different factors that influence this coverage and the effects on users of the networks.

An important conclusion of the event (which will be incorporated into the agenda of the new network) was that it would be fruitful to bring more academics in contact with artistic venues and festivals so that they can provide a theoretical perspective on practice-led research.

These and further reflections are covered in detail in the event report that is available on the Methods Network website.

PRODUCT DESIGNING NETWORK

Organized by Paul Rodgers, School of Creative Industries, Napier University.

The network comprised of the following events:

Workshop 1: Emerging Research Methods for Product Design, Napier University, 8 November 2007

Workshop 2: Digital Product Design, University of Dundee, 23 November 2007

Workshop 3: Domestic/Public Rapid Prototyping, Gray's School of Art, The Robert Gordon University, 6 December 2007

Workshop 4: Creativity, The

The Product Designing Network is open to product designers from both academic and industrial backgrounds

Technology is radically changing the landscape of product design. Mechanical parts are being replaced with digital electronics, and products are as likely to arrive from a rapid prototyping machine as they are from hand-tools.

The notion of product design is changing from a focus on the consumer object to include issues like services, interactions, media, sustainability, and embedded design. All of these are mediated through technology. This series of workshops established a network to advance product design research and industry by building a knowledge base of current thinking and future projections around this central issue of technology mediated product design. The events took participants through research methods for design practice in order to observe how people engage, exploit, adapt, react and interact with the designed world of products, spaces and services. This process was dependent on the use of various technologies for creating and sharing this knowledge.

Hands-on Activities

Processes and tools such as digital photography; audio recording; digital product design using electroluminescent film; 3D scanning; and 3D rapid prototyping

technologies were all discussed and utilized in hands-on exercises. The first workshop required participants to produce a forty page book of digital photographs with commentary. In the second workshop, participants produced a product prototype, while the third workshop focused on 3D scanning and 3D rapid prototyping technologies. For the final event the participants took part in a period of reflection and a discussion of creativity.

Who Took Part?

Contributors to the events included people with backgrounds in design, anthropology, product design, visual art, social science and engineering. In addition, the events were attended by educators, researchers, students and interested members of the public.

Ready for Manufacture

This series of events had a number of interesting outcomes. Some of the products produced by participants during workshop exercises are potentially ready ready for manufacture. The organizers plan to exhibit these and other materials at the London Design Festival.
Other outcomes include:
• A DVD recording of highlights of the first workshop;
• Manuscript of a book of the activities of all of four workshops;
• Networking and fostering of community;
• Enquiries from the Design Society and Design Research

Society regarding the establishment of a special interest group for ethnography / anthropology for each Society;
• Strong connection forged between design researchers and anthropologists which may lead to remote collaboration on research proposals;
• Application for Beyond Text funding from AHRC;
• Potential submission of a bid for funding to the EPSRC;
• Two papers accepted at an industry conference later in 2008.

Product Scotland is a collaborative venture between Higher Education Institutes involved in product design across Scotland. The collaborative network involves Napier University, Edinburgh, University of Dundee, Gray's School of Art, Aberdeen, Glasgow School of Art, Edinburgh College of Art, University of Strathclyde, and New Media Scotland, Edinburgh. The aim of Product Scotland is to create a network that is primarily, though not exclusively, open to Scottish based product designers drawn from academic and industrial backgrounds and to achieve research excellence through knowledge pooling.

Outputs, news and contacts from and for the network are available at www.productscotland.com. Product Scotland has established a working relationship with Dawnne McGeachy, Learning Manager at the Lighthouse (www.thelighthouse.co.uk). Other key participants include Robin Sayer (Wideblue); Roxana Meechan (TribesNETtribes); Paul Stallard (Leith Agency); Steven Birnie (NCR, Dundee); Allan Pert (Nord Architects); Ray Lucas (University of Strathclyde); Esmee MacLeod (Wearecurious); Matt McKindle (Feersum Enjin); Marissa Lippiatt (NESTA); Michelle

REAL-TIME COLLABORATIVE ART MAKING

Organized by Gregory Sporton, Visualisation Research Unit, University of Central England, Birmingham.
Held at the Visualisation Research Unit, University of Central England, Birmingham, 20 July 2007.

The performers in ditdahbit created and distributed 'artifacts' in the gallery and online spaces during the performance. Images by Mike Priddy

Collaborative artistic performances are increasingly using ICT: perhaps within a local performance context or to connect performers over networks in real-time. The Real-time Collaborative Art Making workshop investigated how the various aspects and techniques of a network can be used to create different models of collaboration. The workshop opened with a presentation on e-Science in the arts and included two performances, one with an Access Grid link up with the National e-Science Centre in Edinburgh. The audience in Birmingham and Edinburgh was interdisciplinary and consisted of artists, humanities researchers and technologists from various disciplines.

The overall theme of the day was how the various aspects and techniques of ICT can be used to create different models of collaboration. The core of the research presented was in the application of networked technologies in a creative arena where the technology had not been designed for that purpose. The aim was not to recreate analogue processes digitally but to instead create new techniques for performance in a real-time context.

From Private Art to Shared Activities

The two main projects presented were Gregory Sporton's collaborative drawing through movement (research done with Carla Wright), and collaborative work devised by Matt Gough, Jonathan Green, Keir Williams and Suzanne Grubham.

The experiments in collaborative drawing used a straightforward and inexpensive whiteboard technology named 'e-Beam'. The presentation showed that by turning the sensors through 90 degrees it was possible to create curves and shapes using choreographed movement. When combined with a second dancer, this created live action drawing in separate colours. By networking the computers and displaying the real-time results, a large audience can participate in the drawing experience. This simple technology is of significant interest because it challenges the assumptions about drawing as a private, personal activity, and turns it into a shared, collaborative activity.

ditdahbit

The afternoon was set aside for the presentation of the collaborative performance/installation 'ditdahbit', followed by a discussion with the artists and the audience. For ditdahbit, a mixture of technologies were used: from paper index cards to plasma screens, combining dance, audio and textual interaction with the worlds of blogging and photography.

Creating these performances required practical models of art-making that encourage experimentation and not a theoretical concept that predetermines how art should be performed in an ICT context. Two methods were employed to answer the primary research question 'Does a networked environment suggest a different model for creating work?' :
   1) by using the social dynamics of collaboration;
   2) by examining how the technical basis that enables collaboration can be transformed for other material, for example taking original material and developing it via a networked solution.

This kind of research could not have taken place without networked technologies as these were crucial in asserting a different model of art making. Ideas for the projects came out of previous work with e-Science understood more in the context of resource-sharing than applying large amounts of computing power to problems.

The event demonstrated to the performers how important the use of designated performance spaces, as opposed to lecture rooms with rows of seats, are for networked performance collaboration. Such dedicated spaces will also need good technical support as the technology can be risky and is even more error-prone when non-technologists are using it to push the boundaries of what we think the technology can do.

Materials and Ongoing Discussions

The event report is available from the Methods Network website. A user group on www.arts-humanities.net and a website at the VRU give access to additional materials such as photographs, videos of the performances and online discussions with performers. The team were asked to submit their work for an Ars Electronica award. The research presented at the workshop sparked ideas for new research projects; the organizer intends to develop several grants to explore issues raised during the day.

Workshop Resources

http://www.biad.uce.ac.uk/vru/collaborativeart/index.php
http://www.arts-humanities.net/real_time_collaborative_art_making

SERVICE-ORIENTED COMPUTING IN THE HUMANITIES 1 & 2

Jointly organized by the ESPRC Service-Oriented Software Research Network (SOSoRNet) and the Methods Network. Held at King's College London, 18-19 December 2006 and 17-18 December 2007.

Traditionally the relationship between the arts and humanities and computer scientists has been one of consumer and producer respectively, with software being developed by computing professionals for use by humanists and arts scholars. In recent years this relationship has begun to change, with the older model no longer working. More and more, development of software for arts and humanities applications is being driven from within the community. There is, however, as strong a need as ever for close working associations between software users and producers. These two jointly sponsored events, held a year apart, concentrated on the means of building these relationships and the development of service orientated software within the arts and humanities.

A key message to emerge from the first workshop was that communities of practice in the humanities are increasingly turning to service-oriented approaches as their data becomes ever more complex and dispersed. The second event provided those researchers with a forum for intensive discussion, framed by a highly focused group of international speakers from the cutting-edge of service-oriented research as applied to the humanities (with examples from music, archaeology and medieval history); as well as from academics working with tools and resources that have the potential to develop new research methodologies based around the service-oriented approach.

Who was the Event Aimed at?

Participants in this workshop included humanist researchers working with, or interested in, advanced network technologies, as well as computer scientists interested in learning more about a new and rapidly developing area.

Discussions and presentations at the event were focussed on the interactions between archaeologists, historians, computer scientists, music information retrieval specialists, library information scientists, and grid specialists (distributed computing).

Alerting Humanists to the Possibilities of Service-Based Computing

There are a wealth of resources available to enable humanists to manage the often voluminous and complex data which humanities research produces and requires. Web-based services, often freely available and highly flexible, are frequently overlooked by humanists when exploring the possibilities available for collecting, enhancing, and presenting their research. Web services such as Google Earth or Second Life can be utilized as ready-made platforms for these types of tasks for a wide-range of humanities applications and fields. These workshops looked at specific tools and methods being developed expressly for humanists, as well as services which are adaptable to their needs, both of which have the potential to transform the humanities and allow for new means of answering questions which are central to the disciplinary concerns of humanists. Much of the work involves orchestrating the use of already existing resources, rather than finding new means of doing what could be done with the potentially very powerful services which already exist, so this workshop addressed the problems of getting these resources to humanists.

Speakers demonstrated a range of cutting-edge tools and methods. Particularly there was the MyMethod work of David de Roure. Projects such as MyMethod are creating new forms of scholarly communication through collaboration. Stephen Downey spoke on his work on Music

information retrieval, Michael Meredith on Virtual Vellum, and mc schraefel, a human computer interaction specialist spoke about her well-known mspace project; a Virtual Research Environment (VRE) for music. Stewart Jeffrey described the larger strategies of the Archaeological Data Service (ADS).

Cross-disciplinary Collaborations

There were numerous cross-disciplinary collaborations, for instance between Lorna Hughes and Stuart Dunn of the Methods Network, and Nicolas Gold, (Network Director of SOSoRNet). Between them they proposed a system called CHIMERA: a service-oriented computing model for archaeological research that

integrates archaeological collections without having to build a huge ontology. A research student in the Department of Computer Science at Kings College London is now developing this project. It has resulted in collaborations with outside companies as well as a funding application to JISC.

About SOSoRNet

SOSoRNet is an EPSRC-funded (2005-2008) collaborative network to bring together communities involved in the design, development, and use of service-oriented software. The rationale for the network's creation was to share problems and solutions between communities to avoid re-inventing the wheel. The network has members drawn from industry and academia and holds variety of workshops on a range of topics including service-composition, geospatial service-oriented applications, services-science, dependability, source-code analysis for services, formal methods in services, and service-oriented humanities computing. It also runs broadly-based service-related workshops.

SPACE/TIME: METHODS IN GEOSPATIAL COMPUTING FOR MAPPING THE PAST

Organized by Stuart Dunn, AHESSC, King's College London, and **Leif Isaksen**, School of Archaeology, University of Oxford. Held at the e-Science Institute, Edinburgh, 23-24 July 2007. Co-sponsored by the e-Science Institute.

Traditionally space has been seen as a stable entity, mapped out in 2D, and imagined in a constant, linear flow of time. This perspective has been challenged before, and recent developments in ICT show how 'space' and 'time' can now be imagined in new ways. The workshop dealt with the application of geospatial technologies to research. Based on a domain-wide overview of the methodologies used, it facilitated a discussion on how they can inform and instigate research-led development.

Three Perspectives on Space/Time

Participants mainly came from 'time'-related disciplines such as archaeology, history and classics. To accommodate their different perspectives, the discussions were organized around three main areas that have seen a lot of recent advances: scale; heterogeneity; standards and metadata.
In the context of scale, questions were asked about the dangers and pitfalls of inter-scale analyses and the representation of interpolated data. Integrating data from heterogeneous sources was another important issue. This was discussed in the context of the ontological status of data derived from mixed sources and the methods used to provide overviews of similarity / disparity between multiple datasets. This led to a discussion about standards and metadata as a means to document decisions leading to the final analysis and the creation of seemingly objective results such as maps.

Truth, Audiences and Web 2.0

The event showcased new Web 2.0 technologies and discussed standards and metadata that are important for all disciplines using a geospatial approach. The use of RSS feeds, KML, GeoRSS, mash-ups and folksonomies were discussed and Google Earth featured prominently. Web 2.0 was understood as a way of creating, sharing and disseminating data, as well as formenting improvements in scholarly communication and opening that communication to the broader public. This was seen as a chance to reach people that previously would not have engaged with academic research. At the same time, it presents risks as archaeological and historical 'truth' is still used as a political argument. Making research data available online, where users can interact with it and set it in new contexts, raises numerous ethical, non-technological issues. However, it was felt that this was happening regardless of whether academics were involved, and several participants stressed the need to actively engage in this process. Interestingly, the event partly happened in a Web 2.0 environment, as the discussions also took place on arts-humanities.net.

> '*Using)arts-humanities.net was extremely useful both in preparing the event and during it.*' Stuart Dunn, Workshop Co-

Building on various other technologies and approaches such as GIS technology and Agent-based Modelling (ABM), the event demonstrated how ICT opens up different ways of organizing and managing data, especially large scale data that could not have been handled otherwise. The use of ABM, for instance, was evidenced through the MASS project that used this approach to create an extremely sophisticated model of early Mesopotamian tell sites, thus helping to challenge simpler 'decline

and fall' hypotheses.

Ongoing Research and Discussions

The main output of the event is a quite detailed report with general reflections, abstracts of presentations, a bibliography and summary reports for each session from the rapporteurs. The following four fields where identified as crucial for future research: large scale modelling; mash-ups and Web 2.0; folksonomies and ontologies; documentation. The user group set up on arts-humanities.net has well over 100 members - demonstrating the wide interest in these questions. Publication plans and further activities are currently being discussed. Participants have given several presentations including materials and conclusions from the event and a grant application directly resulting from it has been submitted to the AHRC.

> "**Having become part of the Methods Network I have been learning about the possibilities of computational methodological approaches for developing one's own research. As a direct result of attendance at an ICT workshop I have put together a research proposal, which draws upon some of the possibilities for digital processing, for submission to the AHRC Early Career Grant Scheme.**" Elton Barker, University of Oxford

Further Information

http://www.arts-humanities.net/mapping_past
http://www.ahessc.ac.uk/geospatial-resources

TALKING CGI

Organized by **Paul Wells**, the Animation Academy, Loughborough University. Held as part of the Art of British CGI conference, Animation Academy, Loughborough University, 15 February 2007.

This event was part of 'The Art of British CGI: Contemporary, Independent and Television Animation', a conference organized as a tribute to animator John Grace. The conference was an opportunity to discuss the history, technology and aesthetics of computer animation outside the feature sector and as a model of British art-making and film practice.

The day saw presentations by industry professionals and filmmakers and a number of screenings, including CGI shorts from 'Red Kite Animation', 'Studio AKA', 'Infinite Frameworks', 'Condor' and 'Red Vision'. The conference attracted educators and students in the animation field and brought them together with industry practitioners, visual artists and researchers from the fields of animation, illustration, typography, film, motion graphics and advertising.

Talking CGI was a ninety minute segment of the conference. The seminar engaged with new technologies and software applications for cutting edge animation in a variety of contexts including commercials, photo realistic documentary, works allied to graphic design, illustration and art.

Core Research Questions for CGI

Talking CGI addressed core research questions about computer generated animated applications in regard to technology, technique, aesthetics and cultural impact by leading contemporary practitioners. It investigated and interrogated the relationship between industry applications, art applications and the educational context of using industry-standard CGI animation software such as Maya. The panel also led a discussion about the state of computer generated animation now, particularly in Britain, as distinct from the history of the American

An image from the 'Red Legion' software developed by Dave Mousley and Red Vision.

animated cartoon and the large, high-profile American studios such as Pixar and Dreamworks. It engaged professional animators from the commercial sector, the auteur director sector, the documentary sector and the visual effects sector in a discussion about their different practices and approaches to their common tools in different constituencies.

Each speaker described the application of state-of-the-art, sometimes custom-created, digital technologies in their sector, making the panel a specific example of ICT being used to create new knowledge through developmental and progressive practice.

The speakers represented different perspectives in the use and application of computer generated animation, and these points of comparison were very important in the development of a discussion about 'definitions' of British CGI. The discussion itself represented a collaborative engagement with this issue, and prompted a number of suggestions for future group working and research enquiries.

Animation Beyond Old Divides

Crucially, the deliberately 'mixed register' of the day's deliveries, papers and panels sought to collapse traditional notions of theory and practice, and to call theorists, creative artists and students into the same areas of debate. As all these constituencies now use the same digital tools, it is crucial to develop a

A still from panelist Marc Craste's work 'JoJo in the Stars'

dialogue between them rather than recreate previous high and low, old and new, art and entertainment schisms and hierarchies. With an increase in postproduction processes in mainstream film making, films are now subject to more computer intervention and to a certain extent, animation. This arguably precipitates a collapse between the disciplines of film study and animation study.

The discussions between the panelists were captured in a report and a video recording that are both available from the Methods Network website. The event led to networking between practitioners, which culminated in some commercial collaborations, and allowed students to engage in discussions with these practitioners. It was a valuable reflection on progress in the field and on options for future directions and collaborations. Talking CGI also facilitated dissemination of knowledge throughout the field, particularly regarding innovations in software that allow independent production access to affordable packages with professional results. The event also helped to create links with regional production companies with a view to possible future collaboration on funding bids.

Talking CGI panelists

Marc Craste (Studio AKA)
Johnny Hardstaff (onedotzero)
Dave Mousley (Red Vision)
Andy McNamara (Condor Studios)

TECHNICAL INNOVATION IN ART HISTORICAL RESEARCH: OPPORTUNITIES AND PROBLEMS

Organized by Anna Bentkowska-Kafel, The Courtauld Institute of Art and King's Visualisation Lab, King's College, London; and Professor **Tim Benton,** Open University. Held at the Centre for Computing in the Humanities, King's College, London, 20 November 2006.

This event addressed the opportunities available to art historians, and the attendant problems, of the development and use of subject-specific digital methodologies. The seminar consisted of two presentations plus discussion. The aim of each presentation was to provide a case study, based on individual research, which raised questions of interest to the wider community.

Screenshots from Anna Bentkowska-Kafel's (seminar organizer) multimedia Ph.D. thesis, Anthropomorphic Landscapes in Western Art, c.1550-1650, completed in 1998.

Case Studies and Discussion

The seminar began with presentations of ongoing individual research projects by the organizers. Tim Benton's recent research has been concerned with Le Corbusier's diaries, and he addressed the problems associated with presenting this material in a robust and user-friendly way using database and web technologies. Anna Bentkowska-Kafel's presentation looked at the concept of digital iconology and its use for the classification of images which simultaneously represent nature in human forms and fantastical landscapes. In both case studies the use of imaging and other computing techniques has been crucial for all aspects and stages of the research. Following the presentations, participants were invited to discuss the broader issues surrounding the use of technical innovation in art historical research.

Topics included:

- What digital tools are required by art historians?
- What criteria should be used for assessing cultural innovation in art historical research?
- What are the problems associated with the preservation and dissemination of research involving technical methods?

ICT for Art Historical Research: Archives, Analysis and Interpretation

The event addressed a range of tools and methodological problems which related to the use of ICT in art historical research. It focused on issues relating to digitization of iconographic and textual documents; use of databases and multimedia applications for data gathering; and interface design. Questions were also asked about analytical concerns such as the use of digital imaging tools for formal and stylistic analyses, and for authentication of art; pattern recognition for the analysis of pictorial compositions; and 3D computer graphics for the analysis of spatial features of pictorial compositions.

Finally the participants considered the role played by ICT in questions of interpretation with regard to digital imaging tools for scaling, overlaying, comparing and contrasting images; digital imaging and database tools for enhancement and deciphering the artist's inscriptions, supporting dating, attribution and description of artefacts; content-based retrieval and other automated imaging processes for indexing and classification of visual material, particularly when conventional methods prove insufficient; and digital multimedia discourse and interactivity as alternatives to the traditional linear and static representation of information.

Outcomes and Ongoing Benefits of the Event

The seminar allowed the speakers to address and discuss some of the issues in the use of ICT in art historical research, which they believe are important for the wider recognition, acceptance and application of computer-based methodologies by mainstream art history. The seminar brought together an audience of representatives of various parties engaged in art studies, preservation and dissemination of e-research, and contributed to a better understanding of the often complex issues involved, and the need for enhanced collaboration. It was particularly satisfying to have the representative of the British Thesis Service present and to be able to advocate the need for preservation of PhD theses submitted in a multimedia format. The participation of picture librarians offered an opportunity to renew the call for easing current barriers in the use of images in art historical research. The importance of these differing perspectives is recognized in the organizers' activity report.

TEXT MINING FOR HISTORIANS

Organized by Zoe Bliss, AHDS History, University of Essex, and **Ian Anderson**, Humanities Advanced Technology and Information Institute, Glasgow. Held at the Humanities Advanced Technology and Information Institute, Glasgow, 17 - 18 July 2007.

Compared to traditional approaches, text mining allows scholars to analyse text in more sophisticated ways and to deal with larger amounts of text or to do more in-depth analysis of smaller corpora. Building upon a previous Methods Network workshop on Historical Text Mining, this event aimed to introduce historians to the methods and tools developed and currently employed by corpus linguists. It was organized by AHDS History and the Association for History and Computing UK (ACH-UK) as a training event, combining presentations and practical, hands-on sessions using and discussing various tools.

Christian Kay's presentation at the workshop looked at the survival of kinship terms in English, Scots and Gaelic.

Involving Historians in ICT

The workshop was intended as a taster to engage historians with text mining and to explore commonalities with linguists who are at the forefront of this kind of research. It was also intended to involve historians more strongly with ICT in general, using text as an incentive to demonstrate the value of ICT methods for historical research. Another intention was to get a better understanding of what text mining meant in relation to approaches such as corpus linguistics and data mining – methods that were also part of the event and are not often clearly distinguished.

> **'There is a huge gap in ICT training for historians.' Zoe Bliss**

The participants were linguists and, mostly, historians. It was felt that it was important that historians working with different methods and on different periods attended as the textual sources they are interested in are often very different – as are their research questions.

Together, this group explored tools such as VARD, VIEW, Wmatrix and WordSmith, and was introduced to resources such as the British National Corpus or the Historical Thesaurus of English; institutions such as NaCTem, the National Centre for Text Mining; and projects such as Armadillo.

Training the Trainers

The workshop provided training to researchers, some of whom are themselves facilitating training at their institutions and are passing that knowledge on. Participants commented on the usefulness of being exposed to tools such as Wmatrix and that they were keen to follow-up on what they had learned. They especially liked the practical session and requested more training events like this one. There was also a particular interest in data mining which was identified as a promising field for future research.

The workshop helped building links between historians and linguists. A user group has been set up on arts-humanities.net, attracting almost a hundred members and broadening the circle significantly beyond the participants of the day. The workshop also strengthened links between AHDS history and the AHC-UK, leading to plans to develop future events together. Unfortunately, these plans have been partly obstructed by the end of funding for the AHDS.

A report on the event and the presentations have been made available via the Methods Network website and arts-humanities.net.

Presenters

Ian Anderson, University of Glasgow
Paul Rayson, University of Lancaster
Clare Llewellyn and Rob Sanderson, University of Liverpool
Mark Greengrass, University of Sheffield
Christian Kay, University of Glasgow

50

THE FUTURE OF INFORMATION TECHNOLOGY IN MUSIC RESEARCH AND PRACTICE

Organized by **David Meredith**, **Goldsmiths College, University of London.** Held at Goldsmiths College, University of London, 8 September 2006.

This workshop was proposed as a follow-up to the Methods Network expert seminar on music, entitled **Modern Methods for Musicology: Prospects, Proposals and Realities**, held at Royal Holloway on 3 March 2006.

Several important issues and themes emerged from that expert seminar. The first of these was the need for a robust technological infrastructure for music-related ICT, including architectures, protocols and representations that support the development of flexible, extensible, affordable and interoperable music processing systems. Discussion also focused on the problems involved in designing music software systems that are both powerful and easy to use. One of the main conclusions reached was that there is an urgent need to raise cross-disciplinary awareness in the field: music specialists should be made more aware of the limitations and potentials of technology; and technologists should better understand the real needs of music practitioners. It was also generally agreed that considerable effort should be put into promoting a culture of inter-disciplinary collaboration.

Raising Awareness

This follow-up workshop provided an opportunity for these issues to be discussed in more depth. It made a significant contribution to raising cross-disciplinary awareness and promoting a culture of inter-disciplinary collaboration. The principal aims of the workshop were:

• To identify worthwhile goals for future inter-disciplinary projects involving collaboration between technologists and music researchers and practitioners.
• To raise awareness among leading music researchers and practitioners of the ways in which technology can (and cannot) be used to improve musical research and practice.
• To raise awareness of the needs of music researchers and practitioners among leading technologists interested in developing systems to be used by them.

ICT Enables New Musicology Research

The event showcased several new developments in computational musicology and demonstrated their usefulness for research and practice: large amounts of data can now be processed with statistically meaningful results while online manuscript systems allow comparison of manuscripts and new and easy ways of communicating results online.

ICT also enables new interdisciplinary work: for example, Alexandra Lamont's presentation considered the use of technology to build computational models of psychological processes. These models of musical performance, of listener behaviour and of musical elements and structure allow comparison of predicted behaviour with human behaviour. This leads to a better understanding of learning processes.

Amanda Glauert presented research from ICT workshops at the Royal Academy of Music that integrates sensor feedback into performances and teaching. An example of this is software developed in cooperation with a physiotherapist to give musicians feedback about their muscle recruitment patterns whilst they are playing. This heightens their awareness of individual strengths and weaknesses and can reduce unnecessary stress on their bodies. The EMG software can produce real-time playback, so that students are able to hear their performance at the same time as viewing their muscle activity graphically. This work has had direct influence on staff and students that were not involved with ICT before.

Interdisciplinarity at Work

A wide range of areas of expertise were represented including engineering fields such as audio signal processing and music information retrieval; humanities fields such as historical musicology and ethnomusicology; and creative fields such as composition (particularly electro-acoustic composition).

The discussions encouraged interdisciplinary ideas and some delegates, particularly from humanities departments, were surprised by how relevant some of the engineering material was to their work. Participants reported that they had made valuable contacts and learned about new tools and methods relevant for their research.

The computer science and music departments at Goldsmiths forged new links as result of the event. Other important connections were made during the day, for example, a cross-disciplinary collaboration was established between researchers applying audio processing tools to ethnomusicological research for tasks such as restoring records.

A report is available from the Methods Network website.

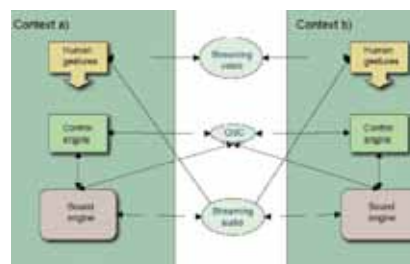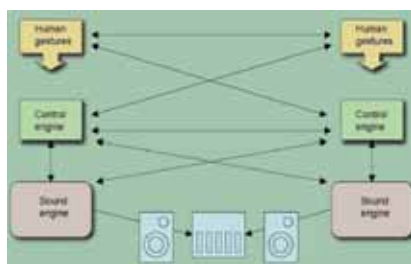# THE POTENTIAL OF HIGH SPEED NETWORKS AS A NEW SPACE FOR CULTURAL RESEARCH, INNOVATION AND PRODUCTION

Organized by Graziano Milano, in partnership with Methods Network and the MARCEL Network. Held at the Centre for Computing in the Humanities, King's College London, 19 March 2007.

The seminar explored the potential of the high speed UK Educational Internet Network 'SuperJanet' as a space for creative productions. To achieve this, participants looked at both the opportunities for new research and artistic practice using networks and at the infrastructure that enabled this. The event addressed the structural issues that small and medium arts organizations face for networked access to SuperJanet, and helped these organizations to start the process of applying for funding for networked access through the establishment of a MARCEL working group.

Examples of co-located and dislocated networked performance from Thor Magnusson's presentation on 'Musical Collaboration Over High Speed Networks.

From Passive Audiences to Networked Co-Producers

To discuss these issues, representatives from media arts organizations came together with independent artists and researchers. They looked at different ways of using network technology for artistic practice. An important issue was collaborations between artists and audience, actually transcending these two concepts in the process, Furtherfield's 'VisitorsStudio' was an exemplar for moving from passive audiences to networked co-producers. Paul Sermon presented his work on telematic approaches to art, for instance using H.323 internet video-conference connections. Real-time artistic practice over networks was also explored in Thor Magnusson's presentation about a networked concert between several continents. Kelly Dipple's presentation dealt with the practice of remote collaborations between different institutions as well as different types of institutions (producers of artistic content; curators; galleries; academic institutions and the public).

Abstracts and papers for all presentations are hosted on the Methods Network website and video recordings are hosted on arts-humanities.net. A report is also available online.

## Outcomes: Connecting Social and Physical Networks

The event helped strengthen links between media arts centres. Participants were interested in learning more about others' projects, recent developments in the field and development of contacts, especially with the academic sector – and they felt that the event achieved that.

A main focus was to explore ways to get access to the SuperJanet high speed network. This led to contacts with UKERNA to confirm that independent arts centres do qualify for access to SuperJanet. The group was also looking for sponsorship for physical connections to SuperJanet. However, this has not yet led to anything concrete. With the changing economic climate, the cost of physically connecting buildings to the network (often £25 000 or more) seems very high for potential sponsors, especially as the leases of many small arts centres are only short term. The group lacked resources to pursue this issue aggressively. It is hoped that connecting people instead of buildings, for instance through new wireless networks, will be a more realistic approach to this problem.

Problems of Funding

Funding is a general problem for small arts organizations and participants felt that it was important for funding bodies to understand the different circumstances under which artists work in comparison to humanities researchers. As the centres cannot guarantee long term planning, funding bodies were advised to use a medium- to long-term approach to the funding of ICT projects. This would enable the development of a cohesive programme instead of unrelated projects. Providing the infrastructure for this was seen as crucial as the independent media centres themselves could not do it.

Participants also discussed the usefulness of developing a high performance multicasting platform that is suitable for arts. The Access Grid platform was seen as a good way of hosting meetings and conferences, but as weak for artistic practice. It was argued that involving the arts in developing such a platform might also lead to better technology as artistic practice often explores new ways of using ICT that lead to a push for technological development.
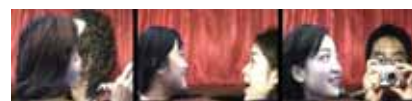
Still from seminar participant Paul Sermon's installation 'Headroom' produced at Taipei Artists Village April 2006.

THEORETICAL APPROACHES TO VISUAL REPRESENTATIONS OF PAST ENVIRONMENTS

Organized by Kate Devlin, Goldsmiths College, London. Held at Goldsmiths College, London, 7 March 2007.

Computer graphics have become a popular way of interpreting past environments, for educational and entertainment value, and especially as an aid to research. The use of three-dimensional computer modelling to create an image of a site or artefact has become an accepted means of communicating cultural heritage information.

Interpreting Computer Generated Images

Computer generated images are not subject to the same scrutiny that text invites, and the possibility of misinterpretation is likely to be high. A neutral virtual representation is unlikely, however, if not impossible. Without any indication of the underlying motivation, images are merely one subjective picture of the past.

Something that proves particularly difficult when creating representations of past environments is how to provide context of an intangible nature, such as a social, temporal or even emotional interaction with the representation. For example, many representations are sterile, empty spaces, devoid of the people who would have built and used them. New ways of representing information are needed to convey such information outside of the physical structure of a scene.

The Need for a Virtual Past

This seminar brought together a range of specialists to critically discuss the theoretical basis of virtual representations and visualizations for cultural heritage, and the issues surrounding communication of 'data' in this medium. Three fields of discussion informed the set-up of the day:

The Need for a Virtual Past - Why are virtual representations being created? How do virtual images aid understanding of past environments? How do we choose which aspects of a multifaceted site to represent?

Establishing Interdisciplinarity - How do we reconcile the work of computer scientists with the work of archaeologists? What are the goals of the participants in terms of their own subject areas?

Conveying the Intangible - How do we introduce non-visual and intangible elements to our representations? Is it desirable, or even possible, to recreate a 'true' sense of the past?

Participants were specialized in archaeological visualization and included other disciplines such as art history, product design and sound engineering. Speakers demonstrated their research and discussions proved useful for feedback and to get an overview of practice in the field. The whole field relies on such exchanges of information as it is cross-disciplinary in nature. The event built on this by including a 'researcher speed dating' section for making new contacts and exchanging information about current projects. Several grant applications were later built on this information.

Using Second Life

A variety of data capture tools and tools for creating 3D models were discussed and Second Life proved to be of particular interest. Participants considered how Second Life might be used to disseminate research outcomes to a wider audience, and how it might be enabled to explore visual representations of past environments. Dissemination of research was an important topic especially in the context of how to present visualization research in a way that makes it obvious that it is about representations of the past not a recreation of the past.

Carl Smith's presentation explored this virtual reconstruction of the Rievaulx Abbey, North Yorkshire

Several themes emerged over the day's discussions. First, that researchers from different disciplines face the same problems when determining what aspects of a site to portray. This includes establishing methods to deal with the potential of misrepresentation. Mathematical approaches and documentation of the processes involved can aid this. Second, that data preservation is a key concern, and that digital information must be preserved, especially if the data is to be reused. Finally, that it is crucial to establish a common language to share ideas and formulate research questions between the diverse disciplines of the arts and humanities and computer science.

A report on the seminar is available from the *Methods Network* website.

Introducing the London Charter

The seminar was also linked with a previous activity funded by the Methods Network - Making 3D Visual Research Outcomes Transparent, a symposium during which the London Charter was developed. The Charter is a document outlining internationally-recognised principles for the use of three-dimensional visualization. Participants of the seminar found these guidelines very helpful for their work and concluded that the Charter should be widely adopted. It suggests consistent ways in which representation creation can be approached and to record the decision making processes in representation creation.

THINKING THROUGH COMPUTING

Organized by Steve Russ, Department of Computer Science, University of Warwick. Held at the University of Warwick, 2-3 November 2007.

Computer science should not only be about number crunching and formal methods, but should instead focus more on modelling and problematization. Starting from this proposition, **Thinking Through Computing** was set up to create a dialogue between humanities and computer science to explore how far a problem-oriented humanities approach could be beneficial to computer science. Another objective was to find out whether the approach to computing, as developed in Warwick (and somewhat simplistically summarized above), could give better support to the arts and humanities than the more formalistic, conservative approach of computers as data processors.

Giving Interdisciplinarity a Voice

The event was designed to facilitate networking and community building. For the first time, it brought together an interdisciplinary group interested in the issues outlined above and it helped them find a common voice. Participants from computer science, information science and humanities, the latter having a particular focus on philosophy and history of science and philosophy, developed an agenda for follow-up activities and publications. For this, they could build upon previous discussions, for

'I have been enormously impressed with the adventure, amongst other things, that these Methods Network funded events represent. Humanities is giving a bit of a lead to funding bodies through this kind of initiative. Whether they will do it again, I don't know, but it seems to me that it has been a stimulus to a lot of inventive, original and innovative thought in relation to how ICT reaches into the broader community.' Meurig Beynon,

instance between the Warwick group and Willard McCarty at the Centre for Computing in the Humanities. Organizers as well as participants believe that such cross-disciplinary collaborations are crucial for further development.

During the two days, discussions and presentations explored the broadening of the fundamental framework of computing by incorporating perception and interpretation instead of sticking to formalistic abstractions. Much more than simply discussing specific tools or applications of ICT, the event was about problematizing the concept of ICT itself.

'The real sticking point here is that we are not accepting a given something called ICT. We want to deepen and transform the way people think about this thing ICT. It is not a term we often use.'

Talks by Annamaria Carusi, Oxford, and Petra Ilyes, Frankfurt, for instance, offered some form of implicit critique of the classical story of computing. Carusi expressed deep skepticism about the naive way in which topics such as realism in visualization are being addressed by conventional computer science. 'By what criteria' she asked, 'should we judge what is a good account of realism in visualization?' Ilyes likewise challenged the meaning of 'representation' that is taken for granted in computer science but used in different senses within the social sciences.

Outcomes and Taking the Agenda Forward

A concrete outcome of the event is a website set up at the University of Warwick with an article written by Steve Russ and Meurig Beynon, outlining ideas behind empirical modelling. A report summarizing the
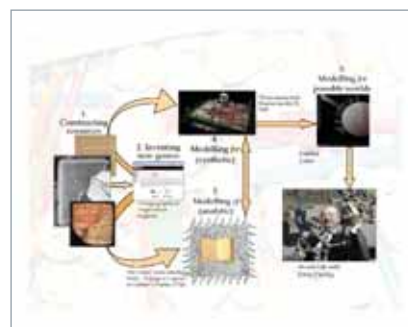
Willard McCarty **A Theory of Modelling for Humanities Research**

event and drawing conclusions from it is available from the Methods Network website.

The event was very successful in building and developing contacts. Organizers and participants felt that the group shared a strong agenda that they could not take forward as individuals in their respective disciplines. Several participants are considering a research visit to Warwick for collaboration and funding opportunities. A follow-up event is currently discussed and may take place as early as in April 2008. This event will also extend the group by inviting interested parties that could not make it to **Thinking Through Computing**.

Several journals have expressed interest in publishing articles on the event, for instance **Interdisciplinary Science Review**; **IEEE Computer**; **International Journal for Unconventional Computing** - the latter may also lead to a conference contribution.

Further Information

http://www2.warwick.ac.uk/fac/sci/dcs/research/em/thinkcomp07/

USING LARGE SCALE XML CORPORA IN LANGUAGE AND LITERATURE

Organized by Lou Burnard and Ylva Berglund Prytz, Oxford University Computing Services. Held at Oxford University Computing Services, 26 November 2007.

This one-day workshop introduced the technologies needed to unlock the potential uses of large scale XML-encoded language corpora, with a particular focus on the most recent version of the British National Corpus (BNC - see **http://www.natcorp.ox.ac.uk/XML edition/**). Participants learned how to explore this particular corpus using a variety of generic XML tools, especially XAIRA:, a general purpose software architecture for the linguistic analysis of large XML corpora. Sessions explored the kinds of language learning activities and linguistic analyses best supported by such tools, and participants discussed the usability of such tools for fundamental linguistic and literary research in large text bases. The course had a strong practical component, and participants were encouraged to provide samples of their own textual materials to experiment with corpus construction and analysis.

Two Main Audiences

The workshop was aimed at two distinct groups of researcher. The first comprised language or literature specialists who are aware of the potential for corpus-based methods in language pedagogy or literary research and want to apply them either to their own corpus material or to the BNC in its new format. The second group was made up of technical specialists aware of the demand for corpus resources who want to gain practical experience of using XML for corpus creation, development, and usage. The workshop organizers aimed to stimulate dialogue between the two groups and to promote a shared understanding of common goals.

Exercises and Presentations

One exercise at the workshop
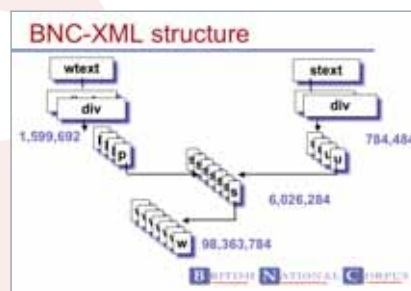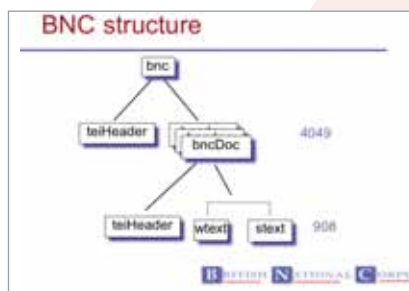
Organizer Lou Burnard's presentation provided an introduction to BNC-XML

required workshop participants to examine a popular nineteenth-century novel with various types of mark-up. This enabled the organizers to demonstrate the multiple possibilities of analysis that could be accomplished through these different ways of marking-up the text. Other aspects of the workshop included sessions on BNC Design, 'Visualising a BNC XML text', a lecture on 'BNC use in teaching', and a session on using XAIRA with the BNC.

Benefits of Corpus Linguistics

Corpus linguistics has given researchers the ability to answer new types of questions about language. This is an area in which it is possible to see some of the largest gains made from the application of ICT to the arts and humanities. The use of computing has allowed for the development of a significant new approach to research into the use of language in everyday life. For language teaching applications the use of corpora has progressed researchers' understanding of how language works and allowed the investigation of questions which were previously impossible to answer. Some of these questions include: What is it that identifies a non-native speaker? What regularities underlie the knowledge of what distinguishes a native from a non-native speaker?

Outcomes and Future Events

All of the exercises from the workshop are now freely available online at the workshop website **(http://www.natcorp.ox.ac.uk/workshop/)**. These enable participants and other users of the BNC to work through the exercises independently. Because of the high demand for the initial workshop, it was run a second time in January 2008. There is a proposal to hold the workshop again as a half-day event at the Teaching and Language Corpora conference (Lisbon, July 2008). This conference specifically attracts people who use corpora for language teaching.

In addition to providing hands-on practical experience of working with text corpora for workshop participants, this event aimed to disseminate and spread knowledge of the possibilities presented using the techniques of corpus analysis. Although most people use computers every day, many humanities scholars are unaware of the potential of computers to enhance their research in far more profound ways. Workshops such as these are central to expanding that understanding.

VISIONS AND IMAGINATION: ADVANCED ICT IN ARTS AND SCIENCE

Organized by Gordana Novakovic, Department of Computer Science, University College London. Held at University College, London, 24 November 2007.

The Tesla Group

This workshop was organized in partnership with the Tesla Group. Tesla is an informal art and science discussion forum dealing with visionary ideas beyond the existing remits of art and science. It aims to form and nurture cross-disciplinary teams, projects and networks, and to assist with applications for funding. Tesla also welcomes artists with or without academic affiliation, theorists and curators active in the field of art and science. Tesla was founded by Gordana

Stills from the video of the event filmed by Amanda Egbe

This one-day symposium centred around methodological questions and problems within the emerging field of art and science, particularly those involving the use of advanced ICTs.

The history of computer and media art now covers a period of almost half a century, so it is clear that the use of ICT in art practice has a long tradition. However, though the field of art and science applies ICT in a novel, challenging and often controversial manner, it still appears to be relatively overlooked. ICT is not only a major facilitator and catalyst in the process of amalgamating art with science; it is also capable of linking the two fields in a truly exploratory way. In addition, many contemporary art and science projects result from experiments using ICT methodologies in ways similar to those used in the latest scientific and technological research. The event provided many examples of ICTs making new research possible.

Bringing Artists and Scientists Together

The purpose of the event was to bring experts from art and science together as the field of art and science is by its nature cross-disciplinary. These experts included practising artists, scientists, curators, academics, and representatives of funding bodies who were all able to contribute their perspectives. The strength of the community gathered was significant, and participants were able to network in powerful and fruitful ways.

The proceedings of the symposium will be available through the symposium website along with a webcast of the symposium and video of the event. Other outcomes include the organizer's activity report, a draft statement on the implications of ICT for the future development of art and science and an exhibition of art and science outputs. A summary paper of findings will be also published in an online or print journal.

What's Next?

The symposium defined a new interface between the different stakeholders engaged in the further development of art and science through the use of advanced ICT. It was the first time the various members of this new community have been brought together, and one of the key drivers for the symposium was the identification and development of the new research themes that support and shape this development.

Further Information

www.cs.ucl.ac.uk/research/tesla/advanced_ict.html

VISUALIZATION AND REMOTE SENSING FOR THE ARTS AND HUMANITIES: AN ACCESS GRID SUPPORT NETWORK

Organized by **Vincent Gaffney,** Institute of Archaeology and Antiquity, University of Birmingham. Various events held at the HP Visual and Spatial Technology Centre, University of Birmingham, and on the Access Grid, October 2006 - October 2007.

Remote sensing and visualization is a strategic and vibrant area of research that informs many areas of the arts and humanities. Whether this data is derived from the surface modelling of structures, ground-based geophysics or the expanding array of sensor types it is clear that many disciplines have a requirement for access to remotely-sensed data. They also need the expertise to visualize and re-present this information through increasingly complex software and augmented or virtual environments.

However, the visualization and remote sensing community in the arts and humanities is dispersed. There are few professional meetings at which these groups gather as a community and the potential to share experience or disseminate best practice between groups is rarely achieved. This project sought to challenge this unsatisfactory situation through the creation of a distributed research network that brought together researchers with software and hardware developers to discuss research methodologies and solutions.

Collaborating Over Networks

Rather than answering specific research questions, the network aimed to create an Access Grid network for delivering resources dedicated to the dissemination of good practice and innovation in the field of visualization of remote-sensed data in the arts and humanities.

The Access Grid Support Network for Visualization and Remote Sensing has brought together arts and humanities researchers with software and hardware developers with an interest in visualization and with particular reference to GRID computing to discuss research

Helen Goodchild, University of Birmingham and Ken Kvamme, University of Arkansas lead Network sessions.

methodologies and solutions. The network was based around one initial network meeting and seven seminar meetings over a year in which critical issues were defined and developed.

The provision of Access Grid kits to support specific research groups or individuals was central to the network. Each kit comprised a web cam, echo cancelling microphone and AG toolkit software plus support for installation.

A Massive Integration of Scientists and Archaeologists

To give an example of these activities, one meeting that was attended primarily by archaeologists also covered various other communities of practice including ancient historians, scientists and visualization specialists. It focused on the North Sea Palaeolandscapes project, a massive integration of scientists, seismologists and archaeologists. This project is a prime example of cross-disciplinary work with large amounts of data that could not have been gathered, processed or analyzed without the use of ICT.

The events demonstrated how difficult it remains to set up remote collaboration over networks, even with access to the special facilities of the HP Visual and Spatial Technology Centre in Birmingham. It became obvious that it is important to

improve technologies for data capture on the Access Grid. Virtually every recording made by the team faced difficulties relating to network traffic and also video card compatibility issues. Finally the team resorted to a traditional video camera for the special event on North Sea Palaeolandscapes.

New Ways of Working

Nevertheless, the network activities demonstrated that it is now possible to bring together researchers from all over the globe to present and discuss their research and explore new ways of working together. Whether this will be achieved in the future with better versions of the Access Grid or by using simpler technology such as Skype, combined maybe with whiteboards and presentation tools, is not of great importance.

The activities led to various papers and reports, including a contribution to an Access Grid white paper published in the United States. The network contributed to the development of archaeology-specific GRID applications that simply did not exist beforehand. A report on the network is available from the Methods Network website and video recordings will be made available too. Increased levels of communication fostered during the events led to the successful JISC/EPSRC/AHRC e-Science GRID application 'Medieval Warfare on the GRID'.

WHOLE BODY INTERACTION: THE DIGITAL FUTURE OF THE HUMAN BODY

Organized by David England, School of Computing and Maths, Liverpool John Moores University. Held at Liverpool John Moores University, 22-23 November 2007.

Theorists who have considered the way people interface with their computers have argued that the means of interaction are very limited, and have suggested that we should have greater involvement between the whole person and their senses in human-computer interaction. Artists have responded to this challenge by exploiting the various technologies that fall under the general banner of virtual reality and that support whole body interaction.

This workshop promoted critical discussion of virtual, mixed and augmented reality and provide attendees with a critical framework for tackling the issues that surround these areas. Participants looked at questions of interaction between humans and computers, exploring the relation of the human body to the digital, and argued for a 'whole-body' approach. Science-based perspectives were supplemented with new media outlooks on these questions.

Wide-ranging Participation and Collaboration

Participants included artists, curators, performers, technicians, and researchers. The event brought together people from different disciplines across arts and sciences to discuss research issues from different perspectives. People from technology backgrounds talked to artists and curators and this diversity of participants gave added interest to the event.

Speakers looked at a wide range of issues related to the interaction between the human body and computers. Topics included motion capture technology, art installations, biocybernetics, the effects of sound on the human body, the body as a digital device and live digital art.
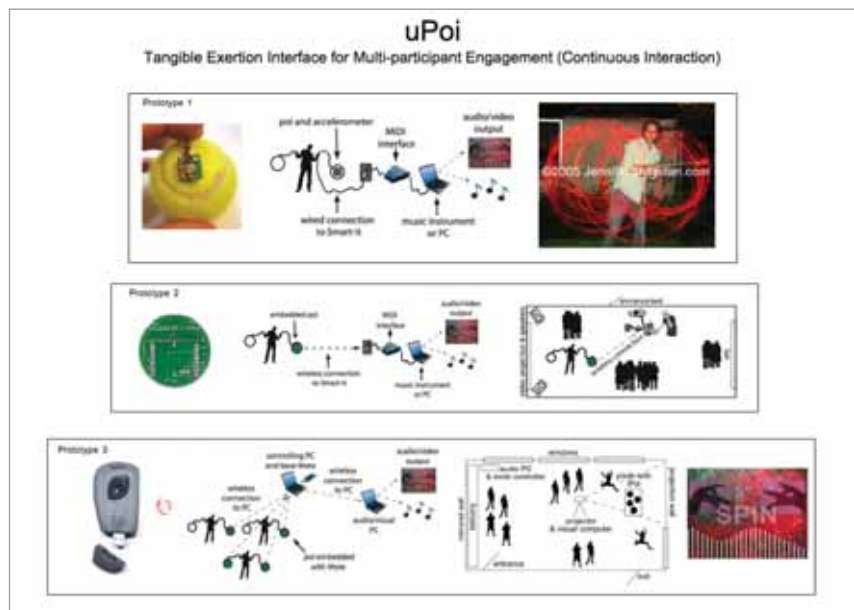
UPoi Tangible Exertion Interface for Multi-Participant Engagement from Jennifer Sheridan's presentation on 'Frameworks and Methods for Digital Live Art'

Workshop Website

The workshop occurred over two days: the first day was dedicated to papers and presentations and the second day continued discussions that arose during these sessions. Participants worked in groups to discuss the issues around setting agendas and critical frameworks for research into whole body interaction. The event website includes presentation papers, position papers, videos of the papers and demos, and a full report on the event. A number of new research and discussion networks came out of the event and there are plans for future events.

What's Next?

There are plans to extend these interactions at future events, and the organizer envisions the creation of a network of excellence holding similar meetings three to four times each year. It is hoped this collaboration will lead to the formulation of project proposals. There also was discussion about collaboration on activities including:

a survey; a journal paper; a future workshop proposal as part of a larger conference; and a networking proposal made to EPSRC or EPSRC and AHRC. The organizer plans to put together another workshop in September 2008 before developing any larger proposals.

Guest Speakers:

Peter Wright, Sheffield Hallam University
Jos Vanrenterghen, LJMU
Taleb-Bendiab Azzelarabe, LJMU
Jennifer Sheridan, BigDog Interactive

http://www.methodsnetwork.ac.uk/activities/act32.html

PART 4: CONCLUSION

by **Susan Hockey** and **Seamus Ross**

A. EXECUTIVE SUMMARY

Over the period of its existence from April 2005 to March 2008, the Arts and Humanities ICT Programme Methods Network (Methods Network) facilitated almost fifty seminars and workshops that brought together interdisciplinary groups of participants to address key issues in digital arts and humanities. The overall aim was to foster collaborations for new research methods and to identify strategic areas for further development. This report presents the findings of an initial qualitative assessment of the impact and outcomes of these events, drawing on interviews with the event organizers, detailed reports on each event, including the results of participant questionnaires, supplemented by information from the Methods Network website where appropriate. The overall impression is of a lively programme that has made enormous progress in articulating the requirements for a co-ordinated approach to providing the ICT methods and tools that will be the future of arts and humanities research. We are extremely impressed at the range of activities and outcomes that have arisen through the efforts of a small team over a short period. As many of those interviewed noted, it is a great shame that the Methods Network is ending and that there has been little thinking so far about how its role will be sustained.

Sections B and C introduce the report and our methods of work which were of necessity constrained by time limits. Section D examines the nature of the events which were very varied in format. Section E outlines the scope and benefits of collaboration and cross-disciplinary participation in the Methods Network events on a national and international basis, highlighting especially the links with computer science. Section F provides a summary review of arts and humanities digital applications as presented at the events. In Section G we discuss the role of the Methods Network in event organization, not just on a practical level but with a serious intellectual engagement with the academic questions. Section H concentrates on outputs and outcomes, both those that are tangible and the intangible benefits of cross-disciplinary networking. In Section I (Lessons Learned and Future Prospects) we discuss the wider implications of the event programme as a whole, drawing also on our knowledge and experience of ICT in arts and humanities. Section J (Conclusion) stresses the need for more investment in arts and humanities ICT, and the role that a co-ordinated network of centres of excellence could play in community building, strategy formulation, education provision and tool development and maintenance.

We highlight these major findings:

- Infrastructure was seen as the single most important issue by almost all those interviewed. There is a need for a co-ordinated strategy to provide ICT support, maintenance, technical development and education for advanced research across all arts and humanities disciplines over a long-term period. We detected a strong will in the digital humanities and arts community to collaborate in this way. What is needed now is a serious discussion with funders and other stakeholders on how this strategy might be developed.
- It is early days yet to assess the full impact of the Methods Network's event programme but we were very impressed by the outputs that have occurred so far and the progress that has been made.
- The Methods Network's cross-disciplinary approach is a major achievement that has fostered new partnerships for new research that otherwise would never have been possible.
- The Methods Network website is a remarkable resource for digital arts and humanities. Its breadth and depth are unprecedented. It should be maintained, and developed as the key source of information for experienced researchers and new researchers.
- More priority needs to be given to tool maintenance, development and support, and more recognition given to tool creation, the aim being to work towards a common technical infrastructure and toolset that would ultimately reduce costs for new projects.
- Awareness-raising is still a major issue. ICT research methods should be embedded further in the postgraduate curriculum and promoted as widely as possible. The library, as the institution's main repository of information, may have a role to play here.
- Organizations outside higher education have an important role in digital arts and humanities research. The links developed by the Methods Network with these organizations need to be maintained and enhanced in future strategy planning.

B. INTRODUCTION

The ICT Methods Network (henceforth Methods Network) was established following a successful bid to the Arts and Humanities Research Council ICT Programme in 2004. The Methods Network was managed by an Executive team based at King's College London, in collaboration with a networked group of Associate Directors representing partner institutions and specific areas of expertise. Since it began its three year period of work in April 2005, the Methods Network has developed and delivered a high profile, dynamic, and engaging programme of expert seminars and workshops. These initiatives have provided a framework for collaboration, innovative thinking, dissemination of methods, tools and approaches, and provided an impetus for new kinds of research, interactions, and methods. The team which

managed the Methods Network have done a tremendous job at catalysing the community and generating interest among a very broad constituency of users, and are to be congratulated on what they have achieved.

The Methods Network initiated and facilitated a variety of activities, but most effort has concentrated on a series of events that were intended to disseminate research tools, to discuss current issues, and to explore future needs and requirements for the development of ICT in the arts and humanities in the UK. The events were cross-disciplinary, focusing on methods and tools. A major objective was to foster collaboration between researchers from different disciplines who might not otherwise have the opportunity to meet. The Methods Network's three-year period of operation ended in March 2008. The aim of this report is to provide a qualitative assessment of the events and their impact, to draw out lessons that can be learned for the future, and to make suggestions for a framework for future developments.

From the interviews it is quite evident that the co-ordination, leadership, and vision provided by the core Methods Network team at King's College London was essential to ensuring the success of the Methods Network's programme of work. This was not merely because of the financial resources that the Methods Network made available. Such core services as advertising events through the contacts of the Methods Network team were essential, as was the availability of a high profile website for dissemination of workshop materials. A number of the interviewees noted that the quality of the contributors and the shape of the event were vastly improved by the suggestions that the Methods Network made to the event organizers about the shape of the programme. The role and importance of the Methods Network in ensuring the success of this programme of activity confirms the view that co-ordination, leadership, and promotion of a community vision is fundamental if as a community we are to ensure continued advances in the use of ICT in arts and humanities scholarship. This conclusion is not new; we saw it in the British Academy/British Library Review **Humanities Information Review Panel: Information Technology in Humanities Scholarship: British Achievements, Prospects, and Barriers,** (London: 1993) and we have seen it more recently as a conclusion of **Our Cultural Commonwealth: The report of the American Council of Learned Societies Commission on Cyberinfrastructure for the Humanities and Social Sciences** (ACLS: 2006), available at http://www.acls.org/uploadedFiles/Publications/Progra ms/Our_Cultural_Commonwealth.pdf.

C. METHOD OF WORK

Most of the information in this report is drawn from interviews of the organizers of the events sponsored by the Methods Network. The interview programme was co-ordinated by the Methods Network. The interviews were carried out by teams at the Centre for Computing in the Humanities (CCH) and Centre for e-Research (CeRCH), King's College London and the Humanities Advanced Technology and Information Institute (HATII) at the University of Glasgow, during January-February 2008. The King's team concentrated mainly on the humanities events and the HATII team worked on the arts events. The interviews took the form of a discussion, conducted according to a framework of questions that was developed by the Methods Network in consultation with us in December 2007. Most interviews were carried out by telephone with a few being held face-to-face. However, the interviews were intended to be fairly open-ended and the organizers were given plenty of opportunity to make more general comments. In some cases the organizers of the events were able to canvas information from the event participants before the interviews, but in the majority of cases, the views expressed were those of the organizers, most of whom had in fact been the initial proposers of the event. The interviewers prepared short reports of each interview which were used as source material for this report. Material from the events which is on the Methods Network website and other project websites was also consulted where appropriate.

The aim was to seek the views of each organizer on the impact of the Methods Network, its events and their outcomes and to make suggestions for future strategies for ICT in the arts and humanities within the UK. The interviews first clarified information about the research tools and methodologies discussed during the workshop. They outlined the range of disciplines represented at the workshop and collaborations between them and identified any tangible outcomes. The interviews looked at the impact and value of advanced ICT methods in arts and humanities research. They elicited information on the intangible outcomes of each event, such as interdisciplinary networking, particularly in the form of any new collaborations that arose as a result of the event or any new research directions that were fostered by the event and the Methods Network. Follow-up activities were noted. Opinions were sought about the role of the Methods Network and about future strategies for the development and support of ICT in arts and humanities research within the UK.

With one exception, the expert seminar on Linguistics: Word Frequency and Keyword Extraction, which was held in September 2005, all the events took place in the period February 2006 to March 2008. Approximately one-third of the events were held in the six-month period before the interviews took place. Several of the organizers noted that arts and humanities research is long-term and that there has not been much time since the event to plan and obtain funding for new collaborative projects. Several events did lead to successful grant applications, but these were in the early part of the two-year period. The organizer of a workshop noted that the event took place within sight of the RAE deadline of November 2007 which meant that there had not been time for systematic planning to follow up

discussion which had taken place at the workshop. Therefore it is still early days to make an overall assessment of the impact of the Methods Network's event programme, but nevertheless a number of lessons can be drawn and pointers made for future strategies.

Within the timescale it was not possible to canvas other participants in the events in detail. The material presented in this report is therefore drawn almost exclusively from what the organizers have been able to tell us, from detailed reports on each event, including the results of participant questionnaires, and from material on the Methods Network website, supplemented, where appropriate by our own knowledge of the field. It may be that since the event other partnerships have been formed and other projects begun about which we have no information. Also, at the time of writing not all the reports and other outputs from very recent events were available.

In the space available here it is not possible to present a comprehensive and in-depth analysis of all the research applications, and outcomes and impact of the Methods Network events. There is sufficient material for a much longer report. Therefore, we have concentrated on major issues. The mention of specific events is illustrative and may not include all that are relevant for the point we are making.

We would like to thank all the event organizers for their willingness to give up time for these interviews and to share their views, and also all the members of the teams who carried out and wrote up these interviews in a very short time scale.

D. THE NATURE OF THE METHODS NETWORK EVENTS

Three types of events were organized by the Methods Network: expert seminars, workshops and workgroups. Each of the expert seminars followed a similar pattern, as did the two workgroups, but, as is indicated below, there was considerable variety in the nature of the workshops.

(i) Expert Seminars

There were nine expert seminars. Most of the application-oriented seminars were held early on in the Methods Network's existence. The events were promoted by the Methods Network Executive in order to showcase the latest developments and to sow seeds for ideas for future workshops. The topics were selected to reflect the scope and depth of expertise represented on the Methods Network Executive and several seminars were organized by Methods Network Associate Directors. The seminars brought together groups of people with common methodological interests or related disciplinary approaches to review the state of the art and to work towards an agenda for the future. Participants were experts, individuals with significant experience and practical and theoretical expertise in their own area of

ICT applications in arts and humanities research. The series of volumes from Ashgate are a major output of the seminars, but the reports and presentations were also captured for the website for future reference. The level of interest in the seminar on **Literature: Text Editing in a Digital Environment** was such that it was reconvened for a second meeting three months after the first. The Methods Network's decision to begin with these seminars enabled the groundwork to be laid for future events. Some of the participants later proposed workshops relating their own methodological interests to other applications. The seminars were attended by Methods Network staff who were able to gain a good overview of current issues, and thus provide guidance to workshop organizers and suggest participants.

(ii) Workshops

Most of the workshops were organized locally in different host institutions in response to calls for proposals which the Methods Network issued from time to time. Overall, almost forty workshops averaging some twenty participants each were convened to address a very wide range of topics. The seeds for many of these workshops were sown at the expert seminars. For example, discussions at the seminar on **Linguistics: Word Frequency and Keyword Extraction** in September 2005 led to a workshop proposal for the applications of text mining to historical texts (Historical Text Mining) held in July 2006 and subsequently to another workshop on Text Mining for Historians in July 2007. Presentations on landscape and experiments with the Access Grid at the expert seminar Virtual History and Archaeology in April 2006 led to the proposal for the workshop **Visualization and Remote Sensing for the Arts and Humanities: Access Grid Support Network** which took place over the year October 2006 – October 2007. The workshop on **The Future of Information Technology in Music Research** in September 2006 was a direct consequence of the expert seminar **Music: Modern Methods for Musicology** held in March 2006.

Most workshops took the form of papers and discussion. The papers were selected to give different perspectives on the topic of the workshop and to highlight topics of current interest and future needs. An overarching theme was collaboration, especially between disciplines. Reports of all the workshops are on the Methods Network website or in preparation. These reports draw out the issues raised at the workshops, particularly those that were common across the disciplines represented. They also draw attention to future requirements and make suggestions for future strategies.

Six of the workshops concentrated on training and user education and were designed to introduce researchers from different disciplines to cross-disciplinary methods and tools. In the workshop **Corpus Approaches to the Language of Literature**, corpus analysis tools that were originally developed for language and linguistic research were applied to the study of literary style. The workshop **Digital Restoration for Damaged Documents** showed how tools used for the digital

restoration of damaged medieval music manuscripts could be applied to other damaged documents. A workshop on the interdisciplinary markup scheme, **Development of Skills in Advanced Text Encoding with TEI P5**, focused on how to provide education for the TEI in different environments and application areas. The TEI was developed as a major international effort in digital humanities text applications from 1988 onwards and is now used in many digital library and commercial publications. The Methods Network workshop was highlighted at the TEI annual international members meeting in 2006. It raised the profile of user education within the international TEI community which had previously concentrated more on technical development. There were also two educational workshops on **Historical Text Mining** and **Text Mining for Historians** and one on **Using Large-Scale XML Corpora in Language and Literature**.

The education workshops were notable in two respects. Firstly the Methods Network provided funding not only for travel of participants, but for the preparation of materials which were made available online. The workshops could easily be run again as indeed was the one on **Using Large-Scale XML Corpora**. Secondly these workshops were also seen as a means of higher level awareness-raising. The education workshops were not about which buttons to press; they were about gaining experience in how a particular methodology and tool implementation can help the intellectual goals of a research project. The Methods Network was seen initially as a forum for advancing interdisciplinary methods and tools, but workshop proposers were aware of the need to introduce new users to existing tools, of how an event that is initially planned as a training workshop can become a forum for methodological discussion across disciplines.

The workshop programme also helped to bring in a broader community of users by forging links with existing projects and leveraging funding from other organizations. Co-funding from the Arts Council for the expert seminar on **Evidence of Value: ICT in the Arts and Humanities** enabled a meaningful discussion on future strategies straddling digital research inside academia and the role of ICT in enhancing the relationship between academia, the creative industries, and the wider culture. A workshop called **Data Sans Frontières: Web Portals and the Historic Environment** was organized by the British Museum, recognizing that much core research material in disciplines such as archaeology is curated outside Higher Education but needs to be made available in the same way as material within HE. The workshop **The Potential of High Speed Networks as a New Space for Cultural Research, Innovation and Production** was a collaboration with UK Innovative Media Arts.

Digital Visibility: A Workshop on Neglected Digital Resources was held as part of the general research agenda of the LAIRAH (Log analysis of Internet Resources in the Arts and Humanities) project which was funded as one of the AHRC ICT knowledge-gathering Strategy Projects. LAIRAH investigated the use of existing arts and humanities digital resources. The Methods Network LAIRAH workshop helped the project by running a focus group where participants were introduced to a range of resources and asked to comment on their usability. It was just one instance of the links between the Methods Network and the rest of the AHRC ICT Programme activities.

Most workshops were one-off events held in a traditional face-to-face environment and lasting one, two or three days, but some organizers were able to experiment with new forms of communication. **Visualization and Remote Sensing for the Arts and Humanities: An Access Grid Support Network** was a series of virtual seminars using the Access Grid. Although not without some technical issues, it brought together participants from as far away as New Jersey and Hong Kong, enabling them to join in the discussion from their own offices. It was a useful experiment in what the future of collaborative networked discussion may be like and was found to work well for set events, for example the North Sea Palaeolandscapes Conference. The workshop **Opening the Creative Studio** was also novel in nature, consisting of four one-day hybrid events spread over one term at The Royal Academy of Music.

Operating in responsive mode has the advantage of facilitating new topics that a particular part of the community deems important. However it can perhaps lead to a rather patchy coverage. We feel that the Methods Network events covered most of the bases, but perhaps a more strategic approach towards the end of the funding period might have enabled a few gaps to be plugged. Notably absent was any event where the main focus was metadata and ontologies. These topics were included in some of the other events, but we think it would have been beneficial to address them specifically as they are central to the discovery and to the maintenance of digital resources. An event on this topic would include Library and Information Science researchers who maintain and use the vocabulary and classification schemes found in libraries, and computer scientists who work on new kinds of multidimensional structures for ontologies. It would also bring the developers and users of existing tools such as the CIDOC CRM, which contains an ontology for cultural heritage information. CIDOC was mentioned by several of the interviewees.

(iii) Workgroups

The Methods Network convened two workgroups on **Digital Tools for the Arts and Humanities**. The workgroups were international, recognizing the need for wide-ranging co-operation and collaboration in both identifying and specifying requirements, and managing, promoting and supporting the introduction of new software tools. The first of these workgroups aimed to provide background material for a submission on tools to the EPSRC which helped elicit an EPSRC grant of £800,000 to the arts and humanities e-Science Initiative.

Participants came from various backgrounds, but all had experience of tool development, and most had been involved at a management as well as a technical level. The group looked at how collaborations are fostered and supported, how partnerships are brokered in the first instance, and how this work is rewarded and evaluated by the different communities. Geoffrey Rockwell, Project Director of what is almost certainly the largest collaborative humanities software development project in the world, the TAPoR (http://portal.tapor.ca/portal/portal) project in Canada, shared his experiences of how the development of a collaborative and inter-institutional set of tools for text analysis was managed within the project. TAPoR was funded by the Canada Foundation for Innovation and succeeded in its overall goals in providing general purpose text analysis tools. The TAPoR site reports that its tools were run over 5000 times in November 2007. TAPoR provides strong evidence that networked collaborative tool development can succeed.

The second workgroup included presentations of tools developed with support from the resource development strand of the ICT Programme Strategy Projects Scheme. These ranged from information mining across distributed research data sets, to methods of linking e-archives and e-publications, to the creation of a flexibly searchable streaming media archive of contemporary and modern art theory and practice. This event highlighted the real need to maintain investment in tools by long-term support and dissemination. Tools are discussed further in Section I.

E. PARTICIPATION AND COLLABORATION

The Methods Network's mode of operation was built on the firmly-held belief that methods and tools are cross-disciplinary, but that within current practice in the arts and humanities there is very little opportunity to share methodological experiences and developments across disciplines. As far as we are aware, the range and scope of these events, taken as a series overall, is unparalleled anywhere. The events drew on a very large number of communities of practice, ranging from art history to literary criticism, to computer game design, to film-making, to psychology, to computer science. Over forty different communities of practice are mentioned more than once in the interview reports. One of the greatest impacts of the Methods Network was the ability to bring together groups of people who otherwise would have little opportunity to meet, and to create an environment where they could bounce ideas around, and begin to form new partnerships to explore the use of existing tools in new application areas and to work towards developing tools that would meet the needs of several disciplines. Most events were invitational and the Methods Network staff drew on their overarching view of the series of events to suggest participants and to bring in new approaches.

(i) Interdisciplinary Collaborations

Some of the events show-cased work that had already been done as a result of interdisciplinary collaboration, but in most cases the event brought together researchers, who would not otherwise have had an opportunity to meet, and fostered new collaborations. The expert seminar **Virtual History and Archaeology** looked at issues in representing the past from the point of view of historians and archaeologists. The interests of archaeologists and historians converge in the area of digital representations, and discussions concentrated on how in some cases more can be done with the digital representation rather than the original: for historians this applied to manuscripts, while for archaeologists it was landscapes which could be represented in this way. The representation of light was also discussed, drawing the attention of historians to the scientific literature about this in archaeology.

At the workshop on **Large Scale Manuscript Digitization** discussions between librarians, archivists and researchers helped each group to understand each other's perspectives, and to work towards procedures and methods that would better serve each other's needs. Librarians also participated in the workshop on **Open Source Critical Editions**, highlighting their role as intermediaries in the scholarly process. The participants at the workshop on **Space/Time: Methods in Geospatial Computing for Mapping the Past** came mostly from a range of time-related disciplines. The relationship with space was highlighted and the group concluded that their next step would be to have more dialogue with those working in performance-related disciplines.

(ii) Engagement with Computer Science

A notable, and in our view very welcome, feature of several workshops was the presence of and engagement with researchers from computer science. Two workshops were convened jointly with the EPSRC-funded SOSoRNet network; SOSoRNet focuses on digital infrastructure and in particular service-oriented software. Prior to these workshops, SOSoRNet had little contact with the arts and humanities communities, but participants at the workshops felt it gave them 'better understanding of some of the issues involved in uptake within the arts and humanities'. It would thus help them ensure that future service-oriented developments can cater for the arts and humanities as well as the sciences. As a result of this workshop members of SOSoRNet will participate in a pre-conference workshop at the annual international Digital Humanities conference in Finland in June 2008.

Computer scientists and technology developers also participated in the workshop on **Epistemic Networks**, which looked at the technological infrastructure, this time from the perspective of how the Grid and Web 2.0 could be integrated to into a wider research infrastructure for the arts and humanities. Discussions focused on interoperability protocols and infrastructure to build services that will allow for the exploration, data mining, semantic integration and experimentation of arts and

humanities resources on a large scale.

There was a different approach to collaboration with computer scientists in **Thinking Through Computing**. This event was organized by the Empirical Modelling group of computer scientists at Warwick University, who wanted to explore whether their approach of problematization and modelling rather than the more conventional algorithmic procedures might be better suited to research methods in the humanities. The workshop included researchers in philosophy and the history of science and information science, and emphasized the value of thinking at fundamental and philosophical levels about computing, and seeking to establish models of humanities research methods rather than providing algorithmic procedures.

The computer scientists who participated in these events were impressed at the level of engagement within the humanities. They commented on the complexities involved and also on the sophistication of applications and methodologies:

'It is quite hard to explain, but if you go to a graphics conference or you go to something on concurrent systems modelling workshop, by comparison with the events you have organized under this umbrella, it seems to me [that here] there is a great deal more of brain engagement at a level other than somehow narrowly within the discipline.'

'At the first workshop I didn't know that much about what was happening in the arts and humanities but now I have understanding of the disciplines in the arts and humanities and the complexities involved and the ways of thinking across disciplines.'

(iii) The International Dimension

The Methods Network Co-Directors, Associate Directors, and Manager are all very well known figures in the international digital humanities community. They were able to leverage their position to invite key international researchers to present their work at events. This added an extra dimension to the discussions and fostered some international collaborations. We provide a few examples to illustrate the scope. David Hoover of New York University, USA gave a presentation 'Word Frequency, Statistical Stylistics, and Authorship Attribution' as an application of word frequency analysis of contemporary American poetry and Victorian novels at the expert seminar **Linguistics: Word Frequency and Keyword Extraction**. At the expert seminar on **Literature: Text Editing in a Digital Environment**, Julia Flanders of Brown University, Providence, USA, discussed 'Digital Editing, Text Markup, and the Construction of Textual Reality', and at the expert seminar on **Music: Modern Methods for Musicology** Frans Wiering of the University of Utrecht, Netherlands discussed 'Digital Critical Editions of Music: A Multidimensional Model'. Gregory Crane, Editor-in-Chief of the Perseus Project, presented his views on depth of encoding vs scale in terms of corpus size at the workshop **Open Source**

Critical Editions and Suzanne Lodato from the Mellon Foundation, based in New York, provided a valuable summary of their approach to supporting digital projects at the expert seminar on **Sustainability**.

The UK's international pre-eminence in digital arts and humanities was noted in several interviews, especially in the context of the end of funding for the Methods Network and the AHDS. There was major concern that the UK would lose this position:

'I fear that we're likely to be giving away a world lead unless we're careful.'

'We are the envy of the world in this respect and if it's all going to be closed down this is very bad news.'

And another view:

'There are research opportunities that are simply flying by us because we're … haemorrhaging expertise.'

In the age of instant communication, we feel that it important to reach out beyond the UK, and be able to build on the momentum already established by the Methods Network in sharing expertise across international boundaries.

F. SUMMARY REVIEW OF ICT IN ARTS AND HUMANITIES RESEARCH

A review of the programmes, abstracts and, where available, the reports of the Methods Network expert seminars and workshops shows just how diverse and rich the kinds of research that can benefit from the application of ICT methods, technology and theory can be. The papers and discussions at these events demonstrate how important cross-disciplinary collaboration has become to facilitating new scholarship, especially where new techniques are needed. It is evident that much of the new generation of humanities scholarship will only be adequately innovative and developmental if it is aided by the emerging methods and processes and if it is cross-disciplinary. As we have seen, the activities of the Methods Network hit the broad breadth of arts and humanities scholarship. What is really evident, as was apparent in the expert seminar on **Human Enhancement Technologies: The Role of Art and Design**, was that the models of scholarship in the humanities must consider how other disciplines are fostering '"upstream" public participation in scientific and technological advance', as Professor Sandra Kemp described it in the introduction to the workshop.

Within this report we cannot begin to provide a comprehensive overview of the diversity of software. But what we can say is that it is increasingly difficult to conduct humanities scholarship without access to ICT-based tools and that the tools come from a variety of sources. Some are created especially by arts and

humanities researchers, others are borrowed from ancillary disciplines, and still other software is adapted from commercial applications. Fundamentally, however, this is not software for software's sake, but a matter of addressing research questions which can only be investigated with new kinds of tools. The use of ICT is not confined to software, but is also linked to new kinds of dissemination, to the construction of large-scale data sets, and to the theoretical issues that surround their construction.

Applied linguistics, for example, can support humanities scholarship in a wide range of ways, and these were evident in the expert seminar on **Linguistics: Word Frequency and Keyword Extraction**, which drew attention to how corpus analysis methods can enable scholars to investigate language and literary sources. The nature of corpora are changing as well, while some of the early corpora constructed along corpus linguistic principles were relatively small, more recent ones are vastly larger. These include the British National Corpus and the Corpus del Español, each containing more than 100m words, the 40m-word Corpus of Historical English, and the 2m-word corpus of contemporary American poetry. At the same time the tools used in frequency studies have been improved in ways that allow us to see overall the core concepts in texts and to drill down into the data. Moreover, word frequency studies have made contributions to linguistic theory itself. The enhancing of tools and especially newer understandings of style variation have revolutionized authorship attribution and statistical stylistics, so that now as well as identifying authors it is possible to see particular authors' working patterns.

The shift from 100 most frequent words up to 6000 in some studies changes the granularity at which we can study style. For example, John Burrows' recently developed Delta technique can be used to measure the difference between texts based on the mean of the entire corpus. Other recent techniques focused on n-gram frequencies and enhanced ways of representing and storing corpora (e.g. relational databases). The Historical Thesaurus of English and A Thesaurus of Old English, the Scottish Corpus of Texts and Speech (SCOTS) and the Dictionary of the Scots Language (DSL) for instance expose problems with variability in spelling, which plague not only literary scholars but also those working in the historical sciences. The problems associated with the complexity of corpora have led to research designed to predict the number of keywords likely to be produced by a particular text and reference corpus – an approach which enables researchers to predict what would be a poor scale corpus. This increase in the number and range of corpora has also benefited from new generations of software designed to work with corpora including Wmatrix, a software tool for corpus analysis and comparison, VARD, which matches spelling variants to their normalized equivalents, and XAIRA, a general purpose software architecture for the linguistic analysis of large XML corpora.

The significance of large scale corpora (e.g. OCVE and

CFEO) and internet audio-databases to musicology is similar to that in literary scholarship. The seminar on **Music: Modern Methods of Musicology**, which explored music theory, analysis and performance analysis, traditional historical musicology, and composition, showed how ICT could change the kinds of resources with which researchers could work, although it is certainly the case that we are still developing an appreciation of the needs of users. Organizations such as IRCAM (France) (Institut de Recherche et Coordination Acoustique/Musique) have worked to provide the rich array of tools to support musicological study. Tools of value range from those that enable structural analysis and information retrieval in musical audio, to those that support novel modes of computational representation of musical information (e.g. graphemic, acoustic and auditory) and knowledge, and to those that enable the visualization of musical information. Just as in such disciplines as history of art and archaeology, presentation of research in musicology requires multidimensional digital representations. Tools have emerged which support voice analysis (e.g. electrolaryngography and electroglottography which have been used to track fundamental frequency in vocal groups and show that singers adjust their intonation so as to stay close to just tuning), voice training, and enhancing vocal performances.

The diversity of tools used by musicologists now, stretches from WinSingad (http://www.winsingad.org) to enable performers to improve, to Sybil for composition, to ML-Annotation to support score/audio synchronization, comparison and summarization, to ML-Maquette to support the validation of analytical models of a musical work. The Open Archives Initiative has itself become a key mechanism for musicological exchange of metadata. The demands that scholars put on the new tools are quite substantial. For instance MusicXML was seen as inadequate by some scholars because it does not handle 'parallel, intertwined and independent hierarchical structures that occur in music'. Indeed what is evident is that music requires technologies that support multiple representation models including the 'different musical surfaces' (e.g. intent, score, and sound). It is the case that many of the tools that have been developed in the arts and humanities are not accessible to scholars without significant technological backgrounds (e.g. the HUMDRUM toolkit), and this has an impact on takeup and usage.

Some disciplines have not fared as well either in corpus development or in the development of new software tools. History of Art is a good example where the promised research opportunities that are inherent in the new technologies has not been matched by tools that enable historical scholarship. Even the image databases themselves that are available to art historians are limited in scale, detail, fidelity, resolution, and flexibility – indeed in the process of creating art historical corpora we are probably in the same stage that text was in the 1980s. Corpus tools for supporting content analysis, such as the UCREL Semantic Annotation Scheme, and annotation mechanisms that can be applied to different disciplines

and different resources, are areas rich for development and application to other disciplines. The complexity of analyses seen as essential to scholarship indicates that Grid technologies probably will provide a framework for future corpus based research, and certainly will be required to support the use of distributed corpora. The use of Semantic Web technologies in the area of annotation of archaeological data is taking off and will facilitate the presentation of archaeological knowledge. Digitization and representation of texts (e.g. typography, concept mapping, text mining) and the ability to link OCR text with the images of page components is made possible by tools such as Olive Software. Here tools for extracting metadata and indexing are urgently needed. In contrast there has been much progress in the area of documentary editing with the development of tools such as just-in-time-markup (JITM), which help to ensure the accuracy and authenticity of the electronic text. The Edition Production and Presentation Technology and Collaborative Literary Research Electronic Environment, and the continued development of methodologies in the form of the Text Encoding Initiative, reflect the change in the scholarly approach to textual editing which has made it 'now more of a collaborative enterprise', shifting the humanities towards a 'more scientific paradigm'. This evolution of conceptual approaches and representation technologies can also be seen in other disciplines. In archaeology, for instance, CIDOC CRM has become the internationally recognised ontology for the description of artefacts.

As well as adopting innovative conceptual models for representing information, archaeologists, and now historians, are using approaches such as those provided by geographical information systems (GIS) to enable them to represent, handle, and analyse new classes of information in different ways. In addition there are three-dimensional applications such as 3D Studio for analytical purposes in the field of visibility analysis, providing the potential for back-end database structures and middleware which facilitate temporal reasoning about spatial objects in all of our cultural heritage systems. This, combined with virtual reality reconstructions, enables archaeologists, classicists, historians, and those doing theatre studies to ask questions of the data that would otherwise be impossible, and to demonstrate through visualizations the process by which they came to novel conclusions. In some instances the ability to use 'predictive lighting' to change the visual presentation and perception of models gives scholars the capability to see into the context and settings of these virtual reconstructions. Just as archaeologists have begun to take on archaeological reconstructions, so manuscript scholars have adopted technologies to enable them to recover damaged and obscured readings from manuscript sources which have been captured by high-resolution digital imaging.

A comprehensive software survey is really out of the scope of this review, but here we have attempted to provide readers with a flavour for how dependent upon ICT scholars have become, and an indication of the richness of the diversity of existing tools for research.

What we have is a picture of many different applications, but one of the aspects we feel needs to be investigated more is the potential for using essentially the same tool for different purposes in different disciplines.

G. THE ROLE OF THE METHODS NETWORK IN EVENT ORGANIZATION

Methods Network staff and resources were at the heart of the organization of the events. Some events were promoted from within the Methods Network and organized by the Manager or one of the Executive Directors, but most events were supported by the Methods Network in response to calls for proposals. Almost all events were invitational. The Methods Network provided funding for participants' travel and subsistence. This was much appreciated by event organizers who felt that they were able to select the right people for the event rather than those with generous institutional support. Funding meant that participants could attend without giving a paper, but could contribute to the discussion. It also meant that early career scholars and postgraduates were able to participate. After deliberation we concluded that the latter is a very significant achievement. Researchers in this age range grew up with computers and have more confidence in their computing expertise and their ability to ask searching methodological questions. Computing is more firmly embedded in their generation. It is their needs that must be met for the future and they must have a say on what these needs are.

Methods Network funding covered more than travel for the participants. It supported the preparation of training materials for the education workshops and provided a means for this material to be disseminated. The funding also supported a rapporteur, ensuring that a timely account of the event's discussions and outcomes was preserved and made available. Some event organizers had run similar activities in the past and needed less advice on logistics, but where event organizers had less experience in these kinds of activities, the Methods Network gave logistical support and generally helped to ensure the smooth running of the event. This was much appreciated by organizers who felt able to concentrate on the academic content whilst being confident that the event would proceed smoothly:

> 'Part of facilitating research is to have help in organizing these kinds of things.'

Several organizers noted that they had already planned to organize some kind of event on their topic of interest but, before the Methods Network, the only real option for holding it was to attach it to an existing conference. They felt that this was not as satisfactory as a standalone activity because the participants would be restricted to those who could get funding to attend the conference, probably because they were giving a paper, and also because they were likely to be distracted by other activities at the conference. Younger scholars in particular found it difficult to get support to attend

conferences. Also, most existing conferences are discipline-based and would be less appropriate for interdisciplinary work:

> 'It would have been difficult to bring the people together without the funding support of the Methods Network. We could have attached the event to an existing conference, but none of the major conferences could have attracted the sort of people for this event.'

But it was the intellectual input from the Methods Network that had the greatest value. Many of the organizers commented on the benefits of discussions with the Methods Network on shaping the programme and establishing the intellectual structure for the event, also on the advice the Methods Network gave on the optimum number of participants at an event which was primarily discussion:

> 'I had a valuable conversation with Lorna Hughes who suggested ways in which the event could be focused and also in suggesting people who may wish to attend.'

Methods Network staff were actively involved with each workshop. One or more members of staff attended every workshop and engaged with the discussions. They were able to report back to the Methods Network Executive on the event and to identify possible speakers and participants for future events. Over the period of the events, the Methods Network was thus able to build up a large group of interested researchers and to draw on this to suggest participants for workshops based on their methodological rather than disciplinary interests. The Methods Network was also able to identify gaps in the range of topics proposed for workshops and to promote some activities to fill these gaps.

The Methods Network provided publicity and, with the stamp of the AHRC ICT Programme, was able to raise the profile of the event and to give it more credibility within the host institution and elsewhere. Throughout the interview reports there is a great sense of mutual trust and respect between event organizers and Methods Network staff. The Methods Network was viewed as a partner in the intellectual content of the event, not merely as a funder and website host. The Methods Network's co-ordination and engagement with the entire programme ensured a level of intellectual coherence that could not otherwise have been achieved. Moreover it facilitated a progression through the various topics rather than a set of one-off events with little linkage between them.

We feel that the benefits of this co-ordinating role cannot be overstressed. On the logistical side, apart from the very welcome provision of funding, the Methods Network support greatly smoothed the process of organizing the workshop. One organizer described it as 'very professional'. Practical matters were dealt with very efficiently and in the best way possible to facilitate the outcomes of the workshop. Even advice on room layout and catering can be a big help to people who have not run many similar events. The Methods Network could draw on their experience of earlier workshops to guide organizers later on in the series. But it was on the intellectual side where the Methods Network effort was most successful and most appreciated. Their knowledge of the field and their direct engagement with the topic of the event enabled them to help shape the programme, and ensure that the proceedings and outcomes were captured in the most effective way.

H. OUTPUTS AND OUTCOMES

(i) Tangible Outputs

Many of the tangible outcomes are very evident via the Methods Network website which is the main source of information and for the moment the main tangible output. We found the site to be well-designed and easy to navigate. The reports of the meetings appear to capture the essence of the discussions and, where available, the abstracts, papers and Powerpoint presentations provide detailed information from the meeting. The availability of audio and video material on an academic website is still relatively novel, although it is widely used on many other sites. It is less easy to skim audio material, and we will be interested to see how much use is made of this material. Inevitably some material from the later workshops is not yet available. The Methods Network team are to be complimented most highly on the site. We are not aware of any similar resource in the arts and humanities which covers so many topics in such depth. It is already a key resource for practitioners in digital arts and humanities, and has the potential to be a major tool for all those working in arts and humanities disciplines. We understand that the website will be frozen, but not taken down, at the end of March 2008. In our view, it is imperative that a way is found to maintain and develop this site for the foreseeable future, and propose that stopgap funds are provided to create and mount the missing material.

The volumes in the Ashgate series Digital Research in the Arts and Humanities, will form an overview of current practice, and should provide a foundation for future practitioners and serve as textbooks for advanced courses. These volumes are still in preparation, but it is our understanding that they will be available later in 2008. Some of the interviewees commented that the volumes will appear rather a long time after the event. We understand that they are being edited to a high standard. It is debatable whether the effort spent on them was worthwhile, especially as they did not appear in time for the RAE deadline, but their presence in library catalogues and on library shelves will provide an enduring record of current ICT-related research.

Other tangibles included the London Charter, a set of principles for the making the work done using 3-D visualization more transparent, which was created in association with the EPOCH Network of Excellence funded by the European Commission. This charter was

formulated at the workshop on **Making 3D Visual Research Outcomes Transparent** and has now been adopted internationally, most notably by the Italian Ministry of Culture. Teaching materials were prepared for the education workshops and made available via the websites of local organizers, as well as that of the Methods Network. Some of the participants at these events were able to use these materials to teach workshops in their own institutions or associated with other conferences. Follow-up events were also noted as tangible outcomes. Several of these were held with further support from the Methods Network, and some organizers of the workshops held later in the cycle indicated that they would like to organize a follow-up event. A number of organizers also noted that a lively e-mail discussion list had begun as a result of the event.

(ii) Grant Proposals

The Methods Network events fostered new partnerships and led to collaborative grant proposals that would not have been possible before. Fabio Ciravegna of the Department of Computer Science at Sheffield University and Julian Richards of the Archaeology Data Service (ADS) at the University of York, who met at the expert seminar on **Virtual History and Archaeology**, were awarded £370,000 to develop and apply text and data mining techniques across datasets and legacy publications in the ADS archive. Edward Vanhoutte of the Centre for Scholarly Editing and Document Studies, a research institute of the Royal Academy of Dutch Language and Literature in Ghent, used both expert seminars on Literature to strengthen links between participants to facilitate a successful EU grant application proposal 'An interoperable supranational infrastructure for digital editions (Interedition)'. Participants at the seminar now play a leading role in this European COST network. The interviewee commented:

> 'Saying that this COST project is a direct result of the Methods Network is probably exaggerated, but the meetings certainly helped towards defining research questions and bringing parties who knew each other from before, together again.'

Members of the research team for the project 'Interdisciplinary Innovation: strategic creation or self organising success' met at the expert seminar on **Evidence of Value** and were successful in obtaining funding from NESTA for this project, which is hosted at the Cambridge-based Centre for Research in the Arts, Social Sciences, and Humanities (CRASSH), the hosts of the original seminar. It was noted again that members of the team might have met eventually anyway, but that they did so then was a consequence of Methods Network funding, and the event was catalytic in this way. The workshop on **Visualization and Remote Sensing** fostered increased levels of communication, leading to the successful JISC/EPSRC/AHRC E-science GRID application 'Medieval Warfare on the Grid', and the workshop on **Web Portals and the Historic Environment (Data Sans Frontières)** led directly into the EU funded project 'Archaeology in Contemporary

Europe', which aims to construct a universal data description discovery and integration registry for the archaeological community.

Grant applications arose out of partnerships formed at several other workshops or were facilitated and advanced by discussions at the workshop. These include two successful bids to the current NEH-JISC Initiative, which built on discussions at the workshop on **Open Source Critical Editions**. We stress that it is still very early days for there to be more successful grant awards for projects that arose as a direct result of partnerships forged at Methods Network events. Time is needed to articulate the research questions and to plan and organize a collaborative interdisciplinary project. Most funding initiatives have few deadlines in a year and often a proposal is under consideration for months before the result is announced. EU funding calls often have specific lines of activity and missing the deadline can mean missing the chance completely. At least one interviewee noted that a proposal arising directly from a workshop had been unsuccessful, but that the applicants had received encouraging feedback and would submit a revised application.

(iii) Intangible Outcomes

Intangible outcomes are just as important for the long-term. For many of the interviewees, interdisciplinary networking was seen to be the major outcome of the events. Simply being able to meet researchers from other disciplines with similar needs was a revelation to many of them. It sparked ideas for future projects and encouraged participants to gain confidence that there is overlap between disciplines and that they could forge new partnerships:

> 'If you were to push me and say name one thing that the Methods Network provided that's absolutely essential….it provided the basis for engagements and collaborations that it's impossible to assess the value of in the short term…and that's why it's important to have continued funding, for a framework like the Methods Network.'

The interaction with computer scientists was thought to be very important. The organizer of the workshop on **Annotating Image Archives to Support Literary Research** noted that this interaction was central to the event, and pointed to an important way forward for cutting edge research in using ICT for the arts and humanities. A computer scientist who organized a workshop encapsulated what the Methods Network was aiming to achieve:

> 'The intangible outcomes were better as it put me in contact with people that I wouldn't normally have contact with.'

I. LESSONS LEARNED AND FUTURE PROSPECTS

As we have seen, the Methods Network has been remarkably successful in generating a community of action that brings together a diversity of communities both within the A&H and outside. Through Methods Network events it is evident that a substantial new array of methods and tools have enabled research that could not have happened without them. The cross-disciplinary collaborations that have underpinned the creation of these methods and tools have become central to the future shape of scholarship in the humanities. In our view, taking forward the agenda of the Methods Network and building on the impetus it has created is a matter of urgency. As one of the interviewees commented:

'The AHRC needs to get its act together, and realise that it cannot turn the clock back. We are already perilously close to becoming uncompetitive both internationally but also in relation to the other research councils simply because our research infrastructure and methods are nowhere near as highly developed.'

(i) The Long-term Impact of the Methods Network

While we have noted that the outputs from the Methods Network have been substantial during the past three years, the outcomes of the work of the network will take much longer to bear fruit and should be measured much further downstream. Some of the benefits will come from wider awareness of methods and tools that have been made possible by the Network, and others will arise from the collaborations which were created through new kinds of cross-disciplinary interactions enabled by the network. The downside of the process of knowledge development and community building, as done by altruistic engagements such as that inherent in the Methods Network, is that it is very difficult to assess the impact of the activity over time, because the place of the activity in the process by which outcomes are realized is not necessarily transparent. Some effort should be put in to decide how the relationship between Methods Network outputs and outcomes will be benchmarked. This is especially important if the longer-term benefits of activities of this kind are to be justified.

The expert seminars and workshops produced a panoply of valuable materials, and often the results were made immediately accessible in summary reports. These made the outputs accessible to a broader audience. Those workshops that provided detailed abstracts gave users of the Methods Network Information Infrastructure a quick window on the methods, processes, and technologies that could enable new research, as well as quick snapshots of the kinds of new research that had been made possible. The website is, as we have noted earlier, a wondrous

resource, which will continue to gain value as more of the workshop reports are added. One additional feature that would make it even more valuable to the community would be if it were possible for users in the future to add annotations as methods improve, as newer practices, processes and tools emerge, and as papers employing the tools described in the workshops are published. It would be beneficial if, as more and more researchers employ the methods presented in these events, the resulting research could be linked to the underlying methods and processes described on the Methods Network website. Given the scale of the Methods Network and the richness of its outputs, its long-term impact will be quite transforming, and the technology will become part of the normal landscape of our lives, but in the short-term there is a challenge in getting researchers to think outside 'traditional' processes and methodologies.

The time has also come for a new and innovative overall study of digital applications in the arts and humanities, or Humanities Informatics as it is sometimes referred to now. The results of these seminars and workshops would provide an excellent foundation for such a study, which would not merely be synthetic, but would have the potential to provide the theoretical framework for Humanities Informatics. In the past Humanities Informatics has been defined primarily by the practical application of new information processing technologies to scholarly research in the arts and humanities. It has in the past eluded a theoretical framework which is so essential for new disciplines to survive the neo-natal phase. What is evident from the overall perspective of the seminars is that, within disciplines that have embraced new technologies, new kinds of research have been possible. In some instances this new research has produced fundamental changes in the ways of thinking with disciplines. For instance, the seminars found that musicologists using these new technologies for study concluded that the traditional print publication did not provide an adequate outlet for the new kinds of scholarly knowledge that was now being produced. The interviews and event reports show that researchers in archaeology have reached similar conclusions. Curiously, though, there are few digital multidimensional journals currently being produced.

(ii) Infrastructure and Investment

The new research that has been enabled by ICT has not been merely been based upon the application of ICT to humanities and arts scholarship, but has depended upon the development of new kinds of resources, such as large corpora in literary, linguistic, musicological, and television and film studies domains, the digitization and digital-encoded representation of materials in classics, history, literature and history of art, and the creation of databases in archaeology and the performing arts. This recognition that the future generations of scholarship in the arts and humanities will depend upon the accessibility of a vast array of digital resources in digital form is becoming more widespread. Indeed the advances in medical and biological science which are

led by the analysis of high quality data sources have generated the conceptual informatics push which is providing the framework for cultural change in scholarship more generally.

Twenty-first century arts and humanities researchers increasingly require access to these kinds of services and infrastructures. We will need laboratory settings where researchers can experiment with emerging technologies that are not widely accessible, create networks, and engage in discussions. There are numerous barriers to environments of this kind becoming pervasive within the space inhabited by the arts and humanities scholar. Some relate to costs, some relate to exposure to opportunity, some relate to knowhow availability, and still others relate to research culture. Universities have unequal access to both the data resources, and to the skills that would help them to become more proficient researchers. Some institutions have a large enough investment in digital humanities to provide at least partial support for these kinds of activities in terms of staff and technical resources. However, in the context of overall development, one interviewee who is based at such an institution felt strongly that the needs and perspectives of the local institution would inevitably begin to dominate the agenda. A co-ordinated distributed effort would provide a broader perspective.

A study done by the AHDS Performing Arts (http://www.hatii.arts.gla.ac.uk/ahds-pa/AHDS-PA-scopingstudy.pdf) demonstrated that in the performing arts the focus of research interest was not primarily on the final performance, but on the process by which the performance arose. This focus on process can also be seen in other areas of arts and humanities scholarship as well as in the sciences. The Methods Network events provided ample demonstration that the process of scholarship was changing. While the Methods Network events indicated how scholarship will be done and how it will be presented in the future, they also demonstrated that there is a need for ICT methods to be more integrated into the assumptions about humanities research and the infrastructure needed to support that research.

The problem is that key funding agencies and many academic institutions have not responded with the necessary investment in the arts and humanities to make this happen. There has been a pervasive point of view that the use of ICT will reduce the costs of scholarship. ICT is not cheap. Quite the contrary, ICT is expensive and it requires continuous investment. What we have seen over the past twenty years in the arts and humanities has been a variety of serendipitous one-off investments, and expectations within institutions that technology can be turned on for particular arts and humanities projects. This despite studies such as the British Academy's 2004 investigation: "That full complement of riches': the contributions of the arts, humanities and social sciences to the nation's wealth" (http://www.britac.ac.uk/reports/contribution/index.html), which regularly show that the arts and humanities

make fundamental economic as well as social contributions to the wealth of nations. A co-ordinated effort across arts and humanities disciplines would build on existing and future investment, rather than duplicating it, and ensure a more stable base for future developments.

(iii) Education and Training

The seminars and workshops provided a foundation for developing expertise and new collaborations. Some of them offered many of the participants an educational framework for knowledge enhancement and development and others provided training opportunities. The community should acknowledge that it needs to balance training and education in ICT. Training provides researchers and postgraduates with skills to apply tools to conduct research, and in contrast education develops an understanding of how to respond to the previously unknown – how ICT methods and processes can be constructed, deployed, and utilized to re-shape scholarship. In the past there has been a focus on training in teaching related to humanities computing, but the Methods Network events showed that we have reached the point where the community can provide educational opportunities. The shift from training to education is evidence that the discipline is beginning to emerge. At the same time, as is shown by several of the workshops, training remains in many ways central to increasing the penetration of the ICT within research activities. One workshop organizer has suggested that innovative uses of ICTs should be taught at universities within the context of humanities disciplines, so that they reach students earlier than at postgraduate levels, and build expertise earlier in their intellectual development; this should be more broadly adopted.

The Methods Network provided funds for participants from the UK to attend the education workshops. A small fee was charged to international participants. We think it is important to maintain a policy of no-cost or very low-cost training to ensure that researchers who would benefit most from the training can attend. If charges were made for training workshops, the workshops would be less likely to be attended by those who would benefit most, namely young scholars who are less able to get support for their research. Cost-recovery was not thought to be effective. Recovering the true cost would make the workshop too expensive for most likely participants. Recovering a small portion of the cost is barely cost-effective because of the extra amount of administrative work.

(iv) Raising Awareness

Alongside education and training, evidence from the events indicates how essential it is that researchers are provided with the opportunity to see demonstrations of new tools and techniques so they can keep pace with developments. Demonstrations accompanied by scholarly publications provide continuing evidence of the value of the application of ICT to humanities scholarship, but more must be done to increase awareness within

the wider humanities community. Researchers would also benefit from access to exemplars showing them how to use these tools in their research. These approaches to dissemination could be supplemented by the broader production of 'application white papers' designed to make accessible methods and techniques for different humanities communities.

The pace of change in this field often results in researchers reinventing what has already been done. Exchange of knowledge could be achieved by sensible aggregations of existing work, and consolidating existing experience needs to be promoted. Here again, just as we needed repositories of applications, we need a roadmap showing where ICT tools, methods, and theory expertise can be found within the UK. As well as assisting scholars to avoid duplication of effort it will also enable researchers to gain access to expertise not to be found at their current institution. This was the kind of guidance that the AHDS centres provided. Awareness-raising was mentioned by many interviewees. The library website, Google and disciplinary activities appear to be the main initial sources of information for arts and humanities researchers, and the activities of funding agencies, particularly the AHRC, are watched closely. Methodological approaches that cross disciplines do not fit well into this scenario. The JISC does an excellent job of co-ordinating the development of information services within the UK, but anecdotal evidence suggests that many humanities researchers have never heard of JISC or its activities. We see the library as a key player here. Humanities researchers naturally go to the library's information services, and we think that libraries could be encouraged to disseminate more information about software and methods via their websites. We also feel that the funding agencies could take a more pro-active role. Several of the interviewees felt that the stamp of the AHRC-funded ICT Programme helped to raise awareness of their workshop and to gain the support of their institutions

(v) Digital Arts and Humanities Specialists

The application of new technologies requires access to specialist support. In the first Elvetham Hall Conference on Scholarship and Technology in the Humanities in 1990, the eminent philosopher Sir Antony Kenny noted six obstacles to the widespread adoption of ICT methodologies within the arts and humanities; one of these was 'diversion of effort'. In this scenario humanities researchers become programmers and technologists and are deflected from doing the research that they set out to do. After nearly two decades the community has not effectively addressed this obstacle. There are still too few experts available to support the take-up of ICT methods and tools within the arts and humanities research arena. At least three challenges must be addressed. There is a demand for support professionals with a knowledge base that reflects humanities disciplines and a solid educational background in computing science and engineering. The community needs to collaborate with computing science and

engineering to produce PhDs in the humanities with the requisite capabilities to shape the way technology tools, methods and concepts are deployed to enable original research. Finally the arts and humanities community needs to develop a career path that demands PhD-level information professionals who continue to renew their knowledge base to provide education and training for the newer generations of humanities researchers, and whose expertise and contributions are given appropriate recognition. If we look at what is happening in the sciences, and in particular in bioinformatics and space science, these three classes of researchers are emerging in response to an increasingly rigorous research environment. The arts and humanities are no less significant or rigorous. We must cultivate a new generation of intellectual leadership with knowledge, drive, and opportunities for career progression.

(vi) Tools

Many of the events showcased existing projects and the tools that they use. Many of these specialist tools were developed within disciplines, such as those created by IRCAM (France) to support the work of musicologists, or within archaeology, history of art, or linguistics. In some cases researchers have borrowed more general methods and techniques, as in the case of relational databases, or they have found novel ways to employ applications intended for more generic uses. However, it is notable that very few tools were included in more than one workshop, except in those that followed up previous events. It is not that there is a lack of tools. A list compiled from all those given by workshop organizers is very long. A picture of many different tools emerges and most are mentioned only by name with little indication of what they actually do. It is not at all clear how many of these tools are used widely, but the evidence seems to be that it is very few. Many of the tools appear to have been developed for one specific research project and tailored to the needs of that project.

Digital projects would not exist without technology and tools, but because the technology in the arts and humanities is not seen as the end goal, but as a means to an end, it often remains invisible, and it is difficult to obtain information about it. This makes it difficult to advance it. There is almost no recognition given to the tools within these projects or to the digital arts and humanities specialists who play such a substantial role in the translation of the intellectual goals of the project into a working system. Assessment of the projects tends to concentrate on the scholarly content, with little discussion of the functionality of the tools and almost none on the technical aspects of the tools. For those outside of the arts and humanities, making the computational methods used within the disciplines more visible would be a valuable spin-off for arts and humanities research. One of the computer scientists interviewed observed that

> 'Coming from the computer science perspective, there are highly technical advanced methods being produced in the arts and humanities that in software

engineering would count as an end in themselves.'

Many arts and humanities tools would get recognition in their own right in a scientific environment, but at present they are essentially lost, with little return on the effort and investment in creating them.

Awareness-raising was seen as one key issue in relation to tools. The AHDS's ICTGuides (http://ahds.ac.uk/ictguides/) includes a registry of tools, but with little additional information about each one. As far as can be ascertained, there are few other sources of information about arts and humanities tools. The directors of new projects often do not know where to start to look for tools and inevitably begin to write new ones. Taken overall, funding agencies appear to have little knowledge as well. A comment in one interview report notes that

> *'The funding bodies are continually giving money to projects which are doing things that have already been done. This is an incredible waste of money.'*

With a little extra effort, tools can be generalized so that they can be applied to different projects with similar requirements.

A first step in tool provision would be to compile a list of what there is. This step would survey the range of functionality, and make what is available more widely known in a readily accessible tools information database. Simply providing the tool name and technical specification is not enough. It is important to include some descriptive text that captures how the tool can support the intellectual rationale of research applications and methods. The Text Encoding Initiative (TEI) maintains a list of tools that can be used with the TEI XML markup scheme, with descriptions and links to projects that use the tool. The fuller entries in the TEI list at http://www.tei-c.org/wiki/index.php/Category:Tools could perhaps be used as a starting point for tool descriptions. It would also be possible to build on the taxonomy of computational methods (http://www.ahds.ac.uk/about/projects/pmdb-extension/index.htm) compiled by the AHDS for their prototype projects database. Although it can be expected that members of the community will contribute information, compiling and maintaining a tools database needs effort to manage the database, to ensure consistency, and to identify gaps and omissions.

Simply writing the software may suffice for one specific project, but for more general use tools need to be accompanied by good user documentation and by user education. Promotion and marketing are also important for the long-term usability and stability of tools. This means tool development and support is an on-going activity, and funding should provide for much more than merely writing the software. Promotion is often best done early in a project by canvassing the potential users for suggestions for functionality before any software is written. Promotion then needs to continue through demonstrations at workshops and conferences. Once a

tool comes into widespread use, there will be more people with expertise to support it from within the community. User training can also now be provided by video demonstrations over the Internet as well as through documentation and face-to-face workshops.

The evidence from the Methods Network workshops and from presentations at other digital arts and humanities events is of a research environment that does not have resources to support the longer-term use of specific tools. All too often when a project ends, the tools and, more importantly, the intellectual and technical investment in them are lost. The long-term life of tools is also important for the humanities where research projects can take several years. This implies the need for a stable infrastructure and support environment where new users can find the tools they need and begin to use them without major time investment. A stable tool infrastructure would reduce the start-up time for projects. It would also facilitate continuity in an environment where the staff turnover among computing specialists can be high.

The provision of off-the-shelf flexible tools would eliminate much duplication of effort and enable researchers to concentrate more on the research questions that are being addressed by the project, rather than on technical development. The initial investment could easily be recouped by savings within individual projects provided that the tool development is based on an infrastructure developed and managed from within the community. The interview reports indicate strongly that the will to do this exists within the digital humanities community. Taken overall there are many years experience of tool development within this community. It is fully aware of the management issues in collaborative software development and maintenance, and of the need to keep potential developers and users engaged with the issues, and it understands the requirements for setting up a distributed project with a common technical base and an interdisciplinary development team. What is needed is the provision of an infrastructure and funding environment to make this happen.

Recognizing the need to bring tools to the fore, the Methods Network organized two workgroups, focusing not on the technical aspects, but on the larger issues surrounding management, collaborative development and sustainability. The first workgroup brought in the Project Director of a major arts and humanities software project in Canada to share his experiences in the management of a large inter-institutional collaborative tool development that succeeded in its aims. The second workgroup examined the long-term prospects of five of the AHRC ICT Strategy Projects that had developed transferable digital resources, informed by real methodological research needs within the humanities, but had now reached the end of their funding period. When initial development funds cease, there is still a need to disseminate information about the tools over a substantial period of time, to maintain and support them, and to adapt them to work with new datasets. If

support for these essential stages of the life-cycle of a tool is not provided, the tool is likely to go into disuse and the initial investment to be lost.

The sustainability of tools over the long term is of critical importance, and must be considered at the outset of a project. This involves not just migrating and upgrading of tools over a period of time and to new operating systems, but also maintaining some kind of support for the end user. If tools development is successful, there will be a community of users, and this community needs to be nurtured so that it might become more self-sustaining over the long term. Commercial relationships may also be important for tool development, but there is a need to explore how such partnerships may be approached and managed, and to investigate whether there is sufficient market for specialized commercial tools within the arts and humanities, before launching into an arrangement with an organization that may go out of business. An open source community approach might be better, but to become self-sustaining it would need initial support for the promotion, marketing and user education activities that are currently not provided for in the funding of tools.

(vii) Collaboration

The seminars and workshops demonstrated the power of collaboration. They also provide a picture of where collaboration is happening within disciplines. However, there is a need to push towards promoting a culture of collaboration in the humanities. The very processes of collaboration within the arts and humanities need to be the focus of investigation. This could look at what technologies can be used to facilitate distributed collaboration and how they work most effectively, also what kinds of cross-disciplinary research collaborations that are not already happening might prove effective in the future. Collaborations depend upon people and one of the challenges facing communities of practice is identifying the right kinds of people to take part in collaborations. A number of the interviewees commented on the important role that the Methods Network played in ensuring the right kinds of contacts were made. There is a continuing need for this kind of support. Collaboration is a process and it is itself an outcome rather than an output of scholarship.

(viii) Funding

The interviews showed that the researchers were uncertain as to where funds for similar kinds of events and for the development of new technologies might come from. A significant number thought that the resources were most likely to come from the Research Councils (AHRC, EPSRC) or other governmental bodies such as the JISC, or the Arts Council. But an equal number conceded that they had no idea what organization(s) was (were) going to take up funding this area once AHRC monies for ICT had come to a close. Among the suggestions made by interviewees were that we might look to industry, to other bodies such as the European Union, foundations, or even their own

institution. A number of interviewees suggested that sponsorship from industry could be beneficial, but others raised a note of caution for the enthusiasm that exists at the moment for public-private partnerships. While there was no consensus among the interviewees on where future funding might come from, there was a recognition that it was essential if the UK is to maintain its world leadership in the application of information technology to the arts and humanities.

(ix) Keeping up the Momentum

The Methods Network events demonstrated how central ICT has become to the production of humanities scholarship. It is essential that the production of scholarship using ICT is not jeopardized through lack of expertise, lack of awareness of possibilities, or organizational obstacles. While education, training and demonstrations provide vehicles to facilitate the incorporation of ICT methods in the research process, networking opportunities that bring together researchers from different disciplines are fundamental. The work of the Methods Network has shown that there is a continuing and growing need for activities such as these.

There is a widespread recognition that funding is necessary to develop new kinds of technology to facilitate scholarship, and that many of these technological developments will not result in commercializable software applications that will be financially sustainable in and of themselves. The interviewees consistently stressed the need for a long-term and more regular stream of events similar to those that were run under the auspices of the Methods Network, to facilitate ongoing communication and collaboration, as well as to create an environment that would enable new kinds of research. In many instances the events themselves showed that what was needed was support for mechanisms that would create cross-disciplinary networks of researchers, both within the arts and humanities as well to ensure links with other disciplines.

The events and the interviews press home the point that the community requires real ambassadors pushing forward the frontiers of debate in the use of ICT in the arts and humanities. The need for the Methods Network activities is evident from the demand for such activities. Indeed the ways in which these types of events, and this kind of research, are funded need to be developed. These ways need to be conscious of the work that has been done and allow collaboration between those with experience with digital methods and tools and those who need access to that expertise.

The interviewees consistently felt that the investment in the Methods Network had really brought benefits to the community and that the longer term impact was still to be realized. In investing in the Methods Network the AHRC had invested in the future and there would be a longer term return. But there were many that shared the view that three-year support for the Methods Network as well as for other research activities was not sufficiently

long. It can take five or six years to develop structures, knowledge and expertise to facilitate good practice, interoperability and standards, and this is the horizon that should be the focus of future activities. The interviews show that community really does need support with the use of ICT, and a sustained activity such as that led by the Methods Network provided a suitable platform.

As one interviewee reported:

'It's very frustrating that the Methods Network will not be continuing, and it's very frustrating that the AHDS will not be there any more. So at the moment I'm really not clear how people working in this field, artists, academics, will be able to generate funding for this type of event. ... Please express my regret and my sadness that the Methods Network won't be there any more, and there doesn't seem to be much thinking about how the Methods Network and the AHDS will be replaced, and how the work they have been doing will be sustained.'

J. CONCLUSION

In conclusion, the activities of the Methods Network demonstrated not only that ICT methods and tools are central to humanities scholarship, but also that there was 'a very long way to go before ICT in humanities and arts research finds its rightful and needed places'. The investment in ICT in the arts and humanities needs to be much greater and it needs to reflect better the particularities and needs of individual communities. Researchers who do not have access to the most current technological methods and tools will not be able to keep pace with the trends in scholarship. There is a real need for support and infrastructure for distributed research.

The Methods Network has fostered the creation of a remarkable resource and this should be brought to completion and then maintained in ways that will enable the community to contribute to its continued development. One argument might be that research needs to be funded in more responsive mode, if ICT in the arts and humanities is to be adequately supported; funding should respond better to the needs of the community. In our view, as a matter of urgency, a dialogue should begin with funders and other stakeholders about the needs and requirements of the next generation of scholars who will operate in a digital world. Unless this happens soon, all the momentum and expertise that has been built up over the last three years will be lost and the UK will forfeit its pre-eminent position in digital humanities. The digital arts and humanities community of specialists are best placed to take this dialogue forward, and to work out an agenda to build on the work of the Methods Network and to take forward the AHRC ICT Initiative on a long-term basis. We see a flexible co-ordinated network of centres of excellence as the best way forwards: a network of centres similar to the Methods Network, that can operate in a co-ordinated way to allocate resources on a more

responsive basis and remain close to the researchers with whom the Methods Network has created such momentum, would ensure a more stable and sustainable foundation for the development of a lasting intellectual and technological infrastructure for digital arts and humanities in the years to come.

METHODS NETWORK STRUCTURE AND PERSONNEL

Co-directors and Associate Directors

The Methods Network was co-directed by Harold Short (Director, Centre for Computing in the Humanities (CCH)) and Marilyn Deegan (Director of Research Development, CCH), King's College London.

It is a collaboration between several institutions with senior academics from each as Associate Directors: Mark Greengrass, Humanities Research Institute, University of Sheffield; Sandra Kemp, Royal College of Art; Tony McEnery, Computational Linguistics, Lancaster University (until September 2005); Andrew Wathey, Music, Royal Holloway, University of London; and Sheila Anderson, Director, AHDS (from 2006).

Network Administrative Centre

All Methods Network activities were supported by the Network Administration Centre (NAC), based in the centre for Computing in the Humanities at King's College London. This Centre supported the activities and publications run by the Methods Network, including core activities and distributed activities, and promoted and co-ordinated community involvement.

NAC Staff

Lorna Hughes, Manager; Lydia Horstman, Publications and Administrative Co-ordinator; Hazel Gardiner, Project Officer; Torsten Reimer, Research Projects Co-ordinator; Neil Grindley, Project Officer (2005-7); Lorna Gibson, Publications and Administrative Co-ordinator (2005-2006).

Academic Advisory Committee

The Methods Network Academic Advisory Committee ensured broadest coverage of all aspects of ICT in the arts and humanities.

Barry Ife (Chair), Guildhall School of Music; Kathryn Sutherland, University of Oxford; Don Spaeth, University of Glasgow; Alan Bowman, University of Oxford; Simon Keynes, University of Cambridge; Tim Crawford, Goldsmiths College, University of London; Charlotte Roueché, King's College London; Tom Corns, University of Wales Bangor; Julian Richards, ADS and University of York; Charlie Gere, Lancaster University; Bruce Brown, University of Brighton; Alan Marsden, Lancaster University; Chris Bailey, Leeds Metropolitan University; Richard Ovenden, Bodleian Library, University of Oxford; Rowena Loverance; Barry Smith, University of Bristol; Jemima Rellie, Tate; Jon Wozencroft, Royal College of Art; Paul Ell, Queen's University, Belfast; Seamus Ross, University of Glasgow; Chris Banks, University of Aberdeen; Aidan Lawes, The National Archives.

AHRC Steering Committee

David Robey, Reading University/AHRC ICT Programme (Chair); Sheila Anderson, AHDS; Bruce Brown, University of Brighton; Marilyn Deegan, King's College London; Celia Duffy, Royal Scottish Academy of Music and Drama; Susan Hockey, University College London; Harold Short, King's College London; Michael Jubb, UK Research Information Network (RIN); Alison Allden, University of Bristol; Tony McEnery, AHRC; Ian Broadbridge, AHRC.