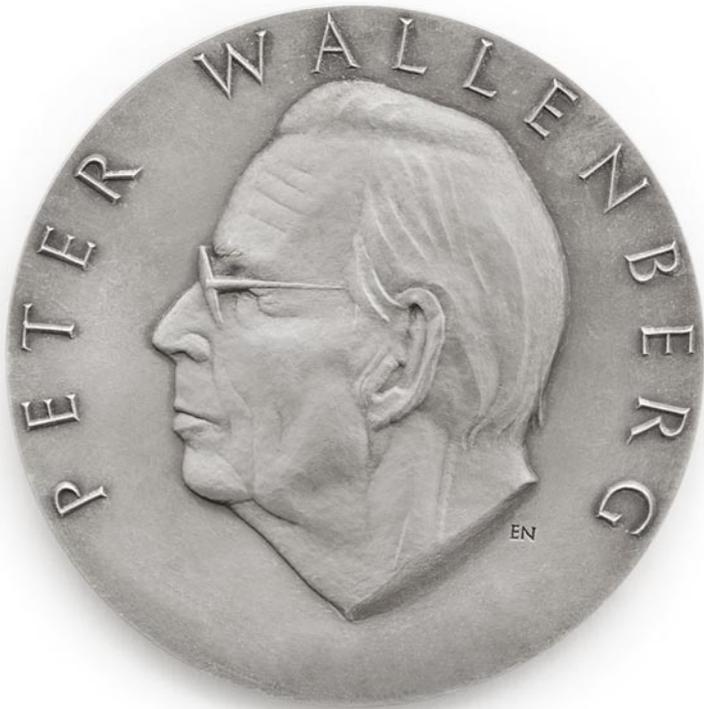


Infrastructure, Space and Media

A BOOK FROM THE
MEDIA PLACES SYMPOSIUM
IN UMEÅ

DECEMBER 5-7, 2012





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Portrait of Dr. Peter Wallenberg (page one)
Medal struck on the occasion of Dr. Wallenberg's
75th birthday May 29, 2001. Designed by
sculptor Ernst Nordin (b. 1934).

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The Humanities and the Digital World

Our world is in the process of changing as a result of the digital revolution and Information and Communications Technology (ICT), which has developed mainly instrumentally and from an engineering perspective. Computers and ICT help people to solve problems more efficiently and the technical solutions are increasingly advanced and accessible. Soon most people in the world will possess a mobile phone and have access to a computer, while it will be possible for a clinic to analyze an individual's DNA sequence in order to provide doctors with a better basis for diagnosis and treatment. Illustrations like these were unthinkable only twenty-five years ago. 7

But the digital revolution is not only instrumental. It is also existential. It has created a world, the digital world, which engages with our physical and social world and changes our identity and our opportunities as individuals. Development has occurred so fast that sometimes we speak of the “digital divide” separating the generations which grew up with computers and ICT as a natural, integrated part of everyday life from those which grew up without these technologies. How are we to understand the digital world and explore and develop it? In an academic context, this is an interdisciplinary issue; it is not only an issue for engineering and science, but also for social sciences, humanities, economics, law, medicine and the arts.

In its early stages, the digital world was more exclusive and one-sided. It was all about machines that were to communicate with other machines. To a large extent, it was applied to problems in science, and science explores a world that is assumed to be more or less independent of the way in which humans perceive it. It is about mechanical connections, cause and effect, and regularity – at any rate in a more traditional approach. The earth rotates around the sun whether or not people believe that it does.

Humanities and social sciences explore a different world, a world that is entirely dependent on how human beings perceive and inter-

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pret it. In a certain sense, this world is created using social norms and values and is maintained and changed through human behavior. We behave *as though* the world was a particular way and we can change our behavior and our approach so that the world appears to be different to what it was before. A classic example of this is money. A one hundred crown note is worth one hundred crowns because we collectively behave as though it is worth one hundred crowns. It has no intrinsic value other than within this so-called social institution or cultural practice. And the cultural variations in the world are considerable; people learn partly different behaviors and approaches to phenomena such as money, democracy and education.

In effect, these phenomena acquire a special epistemological status. What we know about them, that is, what we believe about them on justified grounds, is to a considerable extent dependent on cultural practices and the various forms and expressions and technologies which are available to us for shaping and communicating our experiences and perspectives.

How are our world and our world view, our behaviors and our attitudes affected by the emergence of digital technology and our way of using it? How can we change and develop ICT so as to develop our world and ourselves? These are questions in which the humanities and social sciences can play an important role with their traditional focus on people as thinking, interpreting and communicating beings.

The design of the computer as a tool for analysis needs to take the user's requirements and situation into account. This became an issue early on for the field known as human-machine interaction. And the major public breakthrough for computers and ICT is based to a very large extent on an analysis of users and on well thought-out, user-friendly design of both software and screens, keyboards and various associated devices. As the digital world has grown, the place of information technology in public space has become a central issue for fields like design, architecture and urban development.

The digital world is not just a question of more effective analysis or smarter communication, it is also a medium for creation, not least artistic. What new opportunities for expression does the digital world offer and what in turn are the consequences of this on our thinking, our learning and our way of building social relations? Many users point out the digital world's superior capacity to store and manage very large amounts of information. Others highlight

the digital medium's possibilities of following a process, such as a student's search path from an authoritative reference article in a web-based encyclopedia to the original scholarly article and thence to a virtual lab environment where the student can carry out the experiment on which the article is based. This emphasizes the process, whereas in the past the product and the end result dominated. The student can do things instead of merely reading about a result. And the student's search activity provides a wealth of information on his/her conditions, strategies and requirements. Another example is when a number of individuals supported by a web-based process collectively create a story about an event. The individuals simultaneously follow the genesis of the story and find out about each other's perspectives on what happened, thereby shaping each other's angles on memory and the future. And what they do shapes their identity. To do is to be.

What people believe and hold to be true or essential is not just a question of right and wrong, true or false. The world is ambiguous and access to different angles and perspectives plays a crucial role for knowledge and values. Cultural diversity is an asset, not the least in situations where non-resolved problems are addressed and there is a demand for creativity and multiple vantage points.

Experiences, attitudes and approaches are formed and communicated in the digital world, which is increasingly blending together and becoming one with our physical and cultural world. It is important to be able to read and write. Literacy has become a central concept for education and democracy in recent decades. ICT literacy, that is the ability to use the digital world, is probably equally important, but not yet as strongly supported.

Within studies in the humanities, the digital world has lagged behind. The usefulness of computers for scholarly analysis or for cooperation through networking has not been felt to be as essential as within science and medicine. And the Internet has been considered a rather grotty place which did not constitute an object of study as legitimate as Shakespeare or even soap operas.

It is therefore extremely gratifying that this situation is changing. The Media Places Symposium allows a number of internationally outstanding scholars to talk about their projects or discuss problems and opportunities connected to the presence of the digital world in public spheres and in public spaces.

Media Places is the first of a series of three symposia which the Peter Wallenberg Foundation is arranging in cooperation with Umeå University, the University of Helsinki and Lund University. The second symposium is about ICT and learning and the third will address how the use of digital methods of measurement and analysis led researchers in the humanities to ask new questions on humans as interpreting and learning beings.

None of the three symposia represents any established scholarly field in the sense that there is a paradigm, i.e. a set of issues and methods that the scholarly community sees as the most central to the development of the field. Instead, the fields have been chosen because they deal with real challenges for our future, where an increased commitment from humanists and social scientists provides important impetus to future development.



The Symposium

The symposium “Media Places: Infrastructure | Space | Media,” was held in Umeå December 5–7, 2012. Some 70 persons were able to participate in the symposium despite the severe weather conditions. Due to the digital possibilities some key persons could attend via Skype and other digital media.

The symposium was organized to bring together some of the very best researchers and practitioners at the intersection of infrastructure, space and media to move scholarship about media places significantly forward together with presenting to this scholarly community an example of the considerable potential of the emerging field of digital humanities, if it is given the very best conditions. Responsible for the scholarly program were H. Craig Heller, Sven Strömqvist and Patrik Svensson. The symposium was financed by the Peter Wallenberg Foundation, successfully hosted by Umeå University and moderated by Andreas Ekström.

The symposium addressed two main questions: What are the relationships between knowledge production and infrastructure? And, how does digital materiality change architectural theory and practice, ideas and feelings about space, and the use of space itself? The symposium brought together world-class scholars in architecture, English, media studies, design, information studies, history, physics, biology, linguistics, comparative literature, cinema studies, philosophy, and library science.

The symposium suggested fruitful directions for so-called “digital humanities,” an emerging cover-term for the many growing usages, adaptations and developments of information and communication technologies in the context of the humanities.

Infrastructure, Space and Media

Infrastructure, space, and media are crucial factors for shaping the roles that information technologies play in our daily lives, in creative endeavors, and in digital humanities scholarship. This fact is repre-

sented in the title of the symposium – Media Places – and it was richly demonstrated in the venue of the symposium. The opening sessions were held in HUMlab on the main campus of Umeå University where the participants were surrounded by digital screens of many sizes that are used in a vast diversity of projects. The second day the symposium had the venue at the new HUMlab on the Umeå Arts Campus, where presentations were given in state of the art large teaching spaces and in informal spaces in the midst of design school activities. Performances were staged in the new HUMlab itself where cutting edge electronic technologies produced music and demonstrated creative artistic activities involving human movement. The large, yet to be finished floor screen stimulated much discussion about its potential applications. Issues of infrastructure, space, and media were not only discussed throughout the symposium; they were experienced.

The Program

The symposium was organized to allow for multiple threads of conversation, long dialogue, productive tension and participation both by selected senior scholars, junior scholars and practitioners. The presentations were held together thematically, and there was a discussion at the end of each session. There was ongoing dialogue, discussion and sometimes heated arguments. Apart from these sessions, there were also panel discussions, demo sessions, musical performances and a final discussion convened by commentator **David Theo Goldberg**.

The symposium gave a broad overview of how digital humanities started out from a strong engagement with technology as a tool, and has since moved in the direction of technology as an object of study and as an expressive medium. With increasing interest, funding and broader engagement the digital humanities has been established as a field. The future of that field, however, is very much open for discussion. The symposium played an important role in showcasing diverse, intellectually rigorous, open, inclusive, and technologically-rich views of the challenges, progress, and future of the digital humanities.

This book illustrates the various talks and discussions and are presented in the same thematic order as at the symposium.

Knowledge Production

As our learning and knowledge production are now intimately linked to technology and media, this also influences traditional humanist subjects such as archaeology, history and literary history. Digital possibilities entail new forms of expression for humanist scholars than the traditional forms in books and articles. Digital tools facilitate for instance collaborative writing, that is to say scholars writing non-linear texts together; a collective content with links and sources that the reader can follow. It also allows multiple points of view about the same subject.

Another possibility instead of a printed product in the shape of a book is to create a digital artifact, which, as well as text, may contain moving pictures, sound, etc., and can also be altered and revised. This entails a shifting of the term knowledge production; the product is not always the most important thing, the actual process is just as important. This in its turn gives rise to several questions that are now being researched. How can alternative kinds of production be assessed, not just like presentations, but as part of the research or learning process? What are the possibilities of publishing a research report with multi-media elements like, for example, dynamic visualizations?

Keynote speaker **Tara McPherson**, Associate Professor of Gender Studies and Critical Studies at University of Southern California's School of Cinematic Arts, led off the symposium with the theme *Scholarly Publishing across Scales – Research in a Networked World*, her talk and abstract are presented in the following text.

She said humanities scholars are particularly well-suited to help us think through such topics as the status of the archive as it mutates into the database, the possibilities for less hierarchical computing, and the cultural contexts of code. She argued that neither theorizing media nor building new technologies is sufficient in itself; we must necessarily do both.



TARA MCPHERSON

How did a feminist film scholar trained in poststructuralist theory end up running a software lab? In answering that question, her talk engaged various histories in the development of computational systems in order to argue that we need more humanities scholars to take seriously issues in the design and implementation of software systems. As a film scholar her role was to produce finely grained close readings of texts. The purpose of the infrastructures she now helps create is to aid us in rethinking how knowledge might be produced and circulated in a digital age when we co-exist with our machines. Put simply, she said, our infrastructures are us. Their materiality matters. Their design is deeply relevant to the future of humanities inquiry, to an ethics of living in and through the machine.

Ten years ago she founded *Vectors*, a digital journal, or rather “a space of experimentation meant to explore how various digital practices and screen aesthetics might shape and stretch humanities scholarship.” *Vectors*’ projects might best be understood to be aligned with the historical avant-garde or experimental cinema. The aim of the journal was to explore new forms of screen language and foster new models of collaboration, by bringing very diverse skill sets together: technologists, designers, artists and scholars in the humanities. The experiments the team undertook with *Vectors* allowed them to begin to understand how scholars in the humanities might use technology differently, she continued. This led her and the team towards building tools and thinking about infrastructure. They found that the collaborative space of *Vectors* shifted the way in which scholars think about their work and the evidence they use: there was heightened attention to process over product and to the shifting practice of writing.

Increasingly the team realized that they needed to think about scaling the work and about new ways to approach the infrastructure for scholarly publishing. This realization came as conversations about the status of linked data, large datasets, new scholarly practices such as amateur knowledge and open peer review in publishing came to dominate in the sciences. With support from the Mellon Foundation and the National Endowment for the Humanities (NEH) and colleagues from four other universities, the team is in the prototyping phase of the Alliance for Networking Visual Culture. Dr. McPherson and her research team have created the publishing platform Scalar, developed for addressing these challenges. Their projects are often collaborative, non-linear, media-rich and “book like.” Collaborative writing challenges conceptions of what research is and can be, how do you evaluate and reward such collaborations, how do scholars get credit for their work? The Alliance is meant to build both human and technological infrastructure, and the technological center of the efforts is the platform Scalar. It is built to author digital humanities projects using all of the forms afforded by contemporary digital media, including video, audio, animation, graphic and interactive design, and the database. It models new work flow practices from the digitized archive all the way through to the university press.

Her talk also explored how vast archives can impact on research. In the future, she sees how analysis and interpretations live side-by-side with evidence in the same document. This means that the reader

of a book would be able to follow the writer on a searchable pathway through a digital archive to understand the author's interpretation in a new way.

Strategic partnerships with four archives (the Shoah Foundation, Critical Commons, the Hemispheric Institute's Digital Video Library [HIDVL], and the Internet Archive) and three university presses (MIT, the University of California, and Duke) provide the testing ground for the investigation of new publishing templates. While some projects might take the user along a scholar's carefully pruned and relatively fixed pathway within an archive, other projects can set the stage for users to begin navigating their own pathways, adding new layers to the scholarly interpretation of the archive.

"Scalar allows you to see data across multiple scales, it connects to our partner archives so that scholars who work with this material digitally can interoperate with the archive itself," Dr. McPherson explained. "Archives can be pulled together for new scholarly approaches; it also provides a kind of seamless workflow that brings the metadata from the archive into the project. One of the research questions is how the scholar's new work is then reflected in the archive. If you have a data set of material, would, for example, seven scholars be able to cut their own pathway through that archive? Then the reader could follow those pathways to the archive and understand the scientific or humanistic interpretation of those materials in a new way. When the evidence can live side-by-side with the interpretations and analyses, some of them could be vigorously peer reviewed and warranted via relationships to established presses; others might encourage more open and bottom-up networks – new, livelier modes of collaboration and curation."

The goal is to build a system that reflects more the mode of thinking of the humanities scholars with whom the team works: a system that takes critical race theory and feminist poststructuralist thought as its core operating principles – it resists the modularity and compartmentalized knowledge of dominant computation design. As such, it mediates a whole set of binaries: between close and distant reading, user/author, interface/database, archive/interpretation and between self and machine.

"While the methodologies of the humanities such as textual analysis or close and slow reading may seem ill-suited to the study of infrastructures, I want to argue that the humanities have much to offer



us as we engage with and even help build new forms of infrastructure,” Dr. McPherson concluded.

Dr. McPherson’s talk was followed by a presentation by **Cecilia Lindhé**, Researcher at HUMlab at Umeå University, who is working in a cross-disciplinary project, *Imitatio Mariae. Virgin Mary as a Virtuous Model in Medieval Sweden*, which aims to study the multimodal representation of the Virgin Mary as a role model for lay people in Sweden during the Middle Ages. By developing new methods and tools, the project investigates how research results can be presented in a novel way – but also how digital technology can help provide a critical perspective on medieval materiality and, more generally, on the humanities as such, Dr. Lindhé explained.

She says classicists and medievalists were early adopters of digital technology and scholars within the field have consequently been at the forefront of digital methods in the humanities. But when this material has been presented, crucial aspects of its original function have been lost. The potential that lies within the digital medium, such as

taking all the senses – bodily movements, touch, voice – into account, have not been used. Texts and images are displayed as art objects in a museum, not to be touched, in contrast to how these items – such as Madonnas – were meant to be touched, carried around, and used in processions etc. during the Middle Ages.

“I’ve been trying to invert this power relation by using humanities tools to challenge the conceptual foundations of existing websites and digital archives of medieval texts and images. I describe this challenge as an aesthetic provocation vis-à-vis computational technology, inspired by Drucker’s book ‘SpecLab’,” said Dr. Lindhé.

Four interactive installations of medieval spaces have been developed so far, and rhetorical concepts have been used as a conceptual basis. The installations’ interfaces allow users to compare and zoom into images, incorporating references to smell and sounds, such as bells, singing and the movements of bodies and footsteps.

Some installations emphasize to a greater extent the necessity of bodily movement and the active participation of the user. *The Sensorium*, for example, registers the movement of a body that approaches the screen and triggers new images accompanied by *Ave Maria* sung in one of the churches. The installation uses *ductus*, which Dr. Lindhé described as the way by which a work leads someone through itself; a quality in a work’s formal patterns that engages an audience and then sets a viewer in motion within its structures.

“We have used *ductus* to analyze and represent the experience of artistic form as an ongoing, dynamic process rather than as the examination of a static or completed object,” she explained.

Instead of thinking traditionally in terms of exhibit collections of medieval Mary, the project aims at developing a model of humanistic research infrastructure that goes beyond databases, 3D modeling, maps etc. and aims at orchestrating the Swedish medieval church as a multimodal space that encourages spatial, bodily, tactical and multi-sensuous involvement.

“Or, in other words, to move from the medieval church as text to the medieval church as experience,” Dr. Lindhé concluded.

In addition to Dr. Lindhé’s talk, **Shannon Mattern**, Associate Professor at the School of Media Studies in New York, who works with media spaces – spaces that *house* media and function *as* media – from the interior to architectural and urban scales, gave her view on the subject.



“I’ll focus on spaces, both physical and conceptual, where we can inhabit knowledge – where we can access knowledge’s raw materials, fashion them into knowledge in any of a variety of forms,” she said.

In her talk she examined three architectural types – each constituting a distinctive physical-intellectual infrastructure for knowledge production. The first was the library, an institution deeply engaged in considerations of its contemporary relevance and its future purpose. Debates surrounding these issues require that the library reconsider its intellectual mission, which must be supported by an informational and physical infrastructure. In her book *The New Downtown Library: Designing with Communities* (2007) Dr. Mattern explores several urban American public libraries constructed since the early 1990s when tensions and potential synergies between the digital and the analogue became more pronounced. She draws on a diverse range of sources to investigate how libraries serve as multiuse public spaces and anchors in urban redevelopment. She also describes how the libraries manifest changing demographics and new ways of organizing collections and delivering media.

When visiting the libraries of the turn of the 21st century she found patterns in design decisions that tacitly communicated what these institutions regarded as the components of knowledge, and how they saw knowledge being made. The standard model implies of a hierarchy of formats – typically with the “popular” DVDs and bestsellers right inside the front door, and the special collections on the top floor – which suggested which media “counted most” in the production of knowledge. But even then, several libraries expressed a rather progressive epistemological vision. Some had integrated media production facilities, suggesting that media “consumption” and “creation” lie on a gradient of knowledge production. And today, there’s much talk about integrating into libraries more spaces for *making* – hacker spaces, maker labs, etc.

This variety of activities, and the variety of media formats that libraries have long accommodated, require that library buildings incorporate a wide variety of furniture arrangements, lighting designs and acoustical conditions to accommodate a wide variety of sensory registers, modes of working, postures, etc. Some designers came to this realization earlier than others: Alvar Aalto, the Finnish designer of Harvard’s Woodberry Poetry Room, which opened in the Lamont Library in 1949, was one of them, Dr. Mattern noted. Looking into the history of this room, she said, she uncovered a design that was very progressively, and dynamically, multi-mediated – a design that allowed for multiple forms of engaging poetry, that made space for performance and making; a design that regarded poetry as something plural: something dynamic, something static and living.

“This physical space created an intellectual architecture for reading, hearing, touching, performing, and making knowledge,” she said.

The second space addressed was the archive, related to the library, but a rather different institution, reflecting a different epistemology, and embodying a different kind of physical space. Creating digital counterparts to physical archives opens up many new possibilities to transform both the intellectual and physical infrastructures defining these institutions. And even some place-bound physical archives have experimented with new spatial configurations that embody a rethinking of what the archive, as a knowledge institution, can be, Dr. Mattern pointed out. She brought up the Neutelings Riedijk Architects’ Institute for Sound and Vision in the Netherlands, a private audio-visual archive serving national and international media producers

and researchers, combined with a museum of Dutch media history. In its form and program the building strives, yet doesn't always succeed, to bridge the analogue and digital worlds, the old archive and the new, she said.

In her talk she also presented an analysis of the museum or gallery, which contains embodiments of knowledge in forms other than those we find in our traditional educational institutions and which, at the same time, can create opportunities for knowledge production through aesthetic experience.

She spoke of chairing a panel discussion on "multi-sensorial exhibitions" at a conference at the Metropolitan Museum of Art. The curators on the panel had created exhibitions on sound, touch and smell.

"Curators and designers can reorganize the physical spaces of their galleries, in order to create exhibitions that engage the whole body, that allow all the senses to be engaged in the process of knowing," she added.

Installations in particular have the potential to envelop us in an experience, to create a space where we can inhabit knowledge, she said. The gallery, with its ever-changing installations, allows its designers to continually reconfigure the relationship between spatial frameworks and intellectual missions.

"Perhaps what we see, hear, touch, and walk through and around in the gallery can inspire a more dynamic understanding of how knowledge is produced in other spaces of experience."



Making

Discussions of knowledge production and digital media often bring up questions of producing, making and creating; not least because digital technology changes the conditions for production and distribution. Making has also become an important point of discussion in the digital humanities and the design community. If making is seen as critical to digital humanities, what kind of making are we concerned with: Computer code, digital projects or traditional academic production? And what is the status of the products made?

Throughout the symposium there was an awareness of how knowledge production is affected and constrained by our infrastructure. For instance, geographical information systems impose a Cartesian model of space, and 3D visualization toolsets tend to conventionally be used for creating photo-realistic renderings, as opposed to abstract depictions. Digitally inflected making also increasingly takes place outside the computer and there is a range of toolsets available to create products with digital functionality.

“One of my convictions within the digital humanities environment is that we have an insidious kind of creeping new positivism. Trying to respond to that involves revisiting some fundamentals – such as the basic fact that every object we work with within the digital environment is a surrogate.” 25

Thus began Professor **Johanna Drucker**, one of the pioneers in digital humanities, her talk *Making Space into Place: Probabilistic Materiality and Experiential Metadata*. She argued that space is constructed according to experience, that it does not exist *a priori* as a bucket into which objects or activities are placed.

In her talk she focused on the connection between the infrastructure environments in which we work and the assumptions they reinforce, and sketched out theoretical frameworks for shifting away from



positivist approaches, reasserting the validity of humanistic methods. She also took up some project-based experiments making experiential metadata to demonstrate alternatives.

Professor Drucker began by talking about the making of space and referred to the work of the archaeologist Stuart Dunn, involved in a number of research projects using digital methods. One example is the “Motion in Place Project,” in which motion capture is used to better understand the ways Bronze Age spaces were used. In his writing, Dunn makes clear that space is an “artifact,” she said, effectively created by human activity, not merely a container for it. Not an *a priori* given, but an experiential environment whose qualia and character are produced through behavior, ritual, and human activity, space becomes place in a non-mystical but inflected manner that does not map directly onto standard metrics.

Sigfried Giedion, the influential architectural historian, made a claim for the role of built form in the making of space that was even more fundamental, she noted. Space is made by architecture, said Giedion.

“Make an arch of any dimensions and place it on a site – the spatial world is redefined dramatically by enclosure, framing, point of view, orientation, scale,” Professor Drucker stressed. In effect, the space is *made* as an intervention into the pre-existing potentiality, as a structuring act.

Going further into the realm of the symbolic, she said, Sheila Bonde’s research into the spaces of medieval monasteries takes up questions of boundaries and gatekeeping, gendered occupation and regulation with regard to use and access. The project exposes the ways that our understanding of spatial experience is anachronistic – we make space according to contemporary concepts, to what we imagine the past to be.

While presenting the Rome Reborn Project, Professor Drucker emphasized that one of the hazards of virtual 3D modeling is the instant repleteness of the imagery. The buildings with their synthetic surfaces are without temporal markers, signs of age or wear. There can be many assumptions and errors built into something like a reconstruction of Ancient Rome. Similarly, a database structure used to classify research data shapes our understanding of those data. She pointed out the importance of more clearly bringing experience to areas such as database classification, stressing that humanistic work is generative and provocative, not empirical. She argued that the humanistic method has to insist on its own place and logic, and that we need to design infrastructure and tools that support such notions.

“We have a number of lies incorporated in an image like the Rome Reborn Project, and it’s not available for proof-testing. It’s linked to certain conceptions to what we think a space is, we make space according to our own conventions of which we are familiar, but we are conveniently blind to these reifications and breaking that is not easy.”

She then shifted to a discussion about probabilistic materiality as, as she expressed it, a “push-back against positivism.”

“Probabilistic approaches to knowledge are not grounded in partial knowledge as an error condition but in partial knowledge as an acknowledged condition,” she said. “A recognition that knowledge is embodied, situated, partial, historical.”

As an example she talked about the work of the anthropologist Eric Michaels, who in the early 1990s, doing fieldwork for his dissertation at the University of California, went to study the impact of

video among the Warlpiri in Australia. Armed with post-colonial theory and sophisticated training, Michaels was prepared to find the indigenous groups exploited by their exposure to mainstream Western media. To his surprise, he found the people in the group had appropriated video equipment for their own purposes and were making long recordings of the landscape. They played these long takes of what, to Michaels, were empty scenes, but the Warlpiri saw the song-lines, the trails and traces of ancestors. Michaels' concept of a photographic image, as a straightforward record of *what is*, of what is present in the visible world, was challenged by what he observed. His expectations about representation changed.

"Michaels had to rethink his understanding of the relationship of site to sight and rethink his concept of a mediated image whose ontological existence is fundamentally overturned by the realization that the recorded image was embedded in a system of meaning production on which it depended. This shift in understanding from an ontological representation to one of experience is crucial for our thinking of how we make space, and think about representation in a digital environment," she noted.

Professor Drucker then turned to a project, involving herself and a group of students at UCLA. It was carried out in Baltimore, but was developed in Los Angeles, and the thesis was that signs make space, they do not simply inhabit it.

The suitably prepared students set out to capture signage in its affective and effective dimensions for metadata records that would attach to the digital images. But they returned with the observation that experiential dimensions were utterly absent from the metadata scheme, she said. The experiential traces could not be inscribed in their images any more than the ancestors of the Warlpiri could be made evident to Michaels.

"The students said: We can describe the materials of the signs, but there is no metadata for experiencing the signs, how they feel etc." They then came up with an experimental metadata scheme to include categories that recorded the "tone" of the sign's language. Words like *shrill*, *strident*, *calm*, *seductive*, and others that were highly descriptive, but without a stable or verifiable reference, came into play.

"This is the kind of thing that makes professional cataloguers nervous: 'Who am I to say that the sign is shrill?' But that's the whole point!" she said. "You cannot guarantee knowledge through a stable

representational system, you must be willing to embrace the fact that it's contingent, it's experimental and never repeatable unless you stay within a positivist or empiristic framework. For me it's a huge shift, to try to model a phenomenological approach to knowledge within the digital humanities."

Humanistic methods can be rooted in interpretation and the tenets of belief that insist on observer-dependent and experiential knowledge can be built within digital environments. The obstacle to such work is a conceptual one, not a technological one, she said. New knowledge models lie ahead so long as we attend to the assumptions on which we construct them rather than taking our cues from domains whose infrastructural methods are at odds with the humanistic endeavor. Interpretation is probabilistic, not positivistic, and our methods are generative and provocative, not empirical.

"We may augment, supplement, make use of all and any approaches to knowledge models as infrastructure in our projects, from quantitative and statistical to laboratory tests, but ultimately, the humanistic method has to insist on its own authority as well," she said.

Professor Drucker summarized some of the issues she had taken up in her talk: the making of place out of the sense of space, the shifts from the literal into the virtual.

"The virtual is the world of symbolic, the symbolic is the world of experience, the world of culture and of exchange," she said.

In conclusion she also took up the project-based experiments with making "experiential" metadata:

"The demonstration was to say that experiential metadata was not ever going to stabilize observation, or the observed entity as a thing in a representational record, any more than a video could stabilize in a representation any particular singular identity of a space or place. These are always things that are produced experimentally according to the imaginary notion that we have, of what that technological infrastructure is as a knowledge producing system."

Making also obviously takes place outside the computer, with the topics of physical fabrication, electronics and do-it-yourself (DIY) practices increasingly intersecting with the field of digital humanities. **Garnet Hertz**, Artist in Residence and Research Scientist in Informatics at UC Irvine, talked about his handmade book series *Critical Making* which offers a critical reflection on how physical objects and critical thinking can intersect.



Dr. Hertz began his lecture by giving a background to his design approach, which is “inspired by doing things the wrong way” – culminating in a large body of contemporary artworks over the past fifteen years that critique the technologically futuristic – including projects that ironically explore virtual reality, telepresence, the cyborg, biorobotics, and augmented reality. This critical approach is inspired by his growing up in a remote and rural part of Canada. Like much of the world, a lack of resources and infrastructure demands a creative “hacking” and working with technologies that frequently break, malfunction, are misappropriated and exist in the real world as a seamful and messy conglomeration of the old and the new.

Critical Making explores how hands-on productive work – making – can supplement and extend critical reflection on technology and society. Using Matt Ratto’s term “critical making” as a starting point, the project is an appeal to the electronic DIY maker movement to be critically engaged with culture, history and society: after learning to use a 3D printer, making an LED blink or using an Arduino, then what?

The maker movement can be described as a DIY subculture interested in the creative exploration of electronics, robotics, 3D printing, and microcontrollers that has been popularized over the last half decade through the publication *Make* (O'Reilly Media), open source hardware like the Arduino, and collaborative hackerspace studios.

From an editorial standpoint, Dr. Hertz's *Critical Making* takes the maker movement and collides it with critical theory, contemporary art, politics and academia. The project started as a Facebook post and evolved into a ten volume publication with 70 contributors. The project takes the topic of DIY production literally by printing an edition of 300 copies on a hacked photocopier with booklets that were manually folded, stapled and cut. In a zine-like distribution, the finished copies were primarily given away for free to project contributors, individuals and institutions important to them.

The production process of printing and binding over 100,000 pages in this project also provides a clear example of how DIY practices can be useful in revealing and unpacking infrastructures that normally exist as invisible blackboxed systems. *Critical Making* explores the black box of academic publishing and distribution, and proposes that a handcrafted book can serve an important role in an academic market that is increasingly digitized.

Chris Speed, Professor in Design Informatics, Edinburgh College of Art at the University of Edinburgh, presented the digital project Comob in his talk *Comobing and other Post-Cartesian Tactics*. Comob explores the potential for collaborative mapping with GPS technology and was developed as a research tool to explore social and spatial relationships between people in motion. The iPhone app allows groups of people to see each other's movements represented on screen as circular nodes with lines linking their individual positions, he explained, asking at the beginning of his talk that listeners download the app to their cellphones. The data is also sent live to visualization software that allows observers to see their movement at a distance. Professor Speed stressed social networks and alternative modes of visualization, which is much in line with Professor Drucker's work.

Previous projects have mapped and tracked individuals, however Comob proposes that those individual tracks are only part of how we move through space. Use of public space is a social activity, one that we perform in relation to other people, he said. Comob allows for ob-



CHRIS SPEED

servation of how movement through space is a social activity, and proposes that those movements can be used to map relationships to space.

“By now you are all moving through the streets with your GPSs,” he pointed out, “Your iPhones are measuring and calibrating a whole bunch of networks, whether you like it or not.”

This makes “Wandersmänner” worth revisiting, he continued, referring to Michel de Certeau, and quoting from his *The Practice of Everyday Life*: “. . . it is below – ‘down’ – on the threshold where visibility ends that the city’s common practitioners dwell. The raw material of this experiment is the walkers, Wandersmänner, whose bodies follow the cursives and strokes of an urban text they write without reading.”

Comob has been used in workshops since 2009 and as an example; Professor Speed showed documentation from the research workshop on co-mapping applications that he ran in Belfast in 2010 together with Jen Southern who is the co-developer of the art/work. Comob allows users to be attached together with a “string” and the researchers wanted to underline what it would mean if movements in a space in a street were contingent on others.

“We asked the users to go into the street and reflect on the subject pollution. They started to move around Belfast in ‘comobs’ and then we brought them back into the workshop where their observations were drawn onto maps. The participants could then talk about this context in which they were in the street negotiating a Cartesian map with a social networking affordance with a highly conversational activity – pollution.”

The use of Comob to support social negotiations of place shifts the emphasis away from recording spaces in time, to concentrating upon mapping social connections. Over the past two years people across the globe have been downloading the apps, Professor Speed said, showing several examples of what he termed portraits of people who have been using the Comob Net. The portraits, he said, are capturing the lines of connection that bind users together, over time and space. The favorite, he went on, remains the “Truckers in Laredo,” two truck drivers called Eduardo and Norma who occupy the Mexican/American border and connect to each other while in truck stops. Professor Speed pointed out that he doesn’t know why the couple is connected, it could be for safety.

“We are of course curious of what they are doing, for all we know it could be a love affair – we like to think it is a love affair. They have been logging in every day for the last two years, constituting a relationship just by keeping in touch with each other.” He concluded by showing a fascinating clip from a BBC movie, where spatial imagery is used. The image, which is much like fireworks, shows taxis pouring into the center of London during the early morning hours.

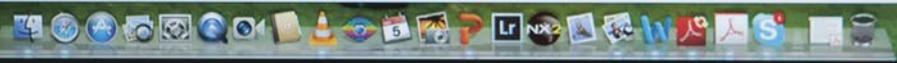
“It infers a great deal of activity but the trails are not correlated, the individuals are wholly independent. When I compare this to the truckers and look at all their connections with each other, whether it’s based on love or logistics, the taxis seem to be incredibly lonely traces,” said Professor Speed, who concluded with a reference to Latour. “He talks about ‘termite spaces’, and at what point the affordances of network and a non-representational move might offer some kind of connection.”

The session on making was followed by several project presentations and case studies that demonstrated making in the realm of digital media, place and infrastructure.

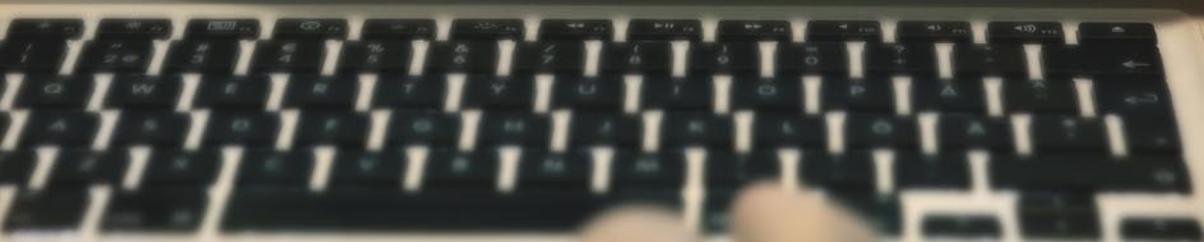


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MacBook Pro



Moving the Field Forward/Shaping

The symposium brought together several of the best researchers in their respective fields as well as a group of junior and upcoming scholars, some of whom were renowned researchers in their own right. They discussed the future of digital humanities under the headline “Moving the Field Forward/Shaping.” In several cases the speakers only had a few moments available, which led the moderator to call this session “scientific speed-dating.”

Emphasis was put on the importance of continued development of the fields associated with the theme of the conference in general, digital humanities in particular. This is a growing field as well as a broad concept, which alludes to how humanists can use information technology as a powerful tool to facilitate new types of research, and the importance of the information society as a vital study object for humanist researchers. In many ways, the topic of media places is close to the digital humanities as a field. An international dialogue is currently taking place on the role and boundaries of digital humanities, so it was natural to bring up that topic at the symposium. Not least in relation to the necessity for interdisciplinary work in digital humanities, the newness of some of this research, the need for technological engagement and the energy among this junior group of scholars.

During the symposium there was a productive and unpretentious discussion across the board, in which the junior scholars also played an important part. This hopefully served as a model for carrying out the work in this emerging area.

One of the conveners, **Christer Nordlund**, Professor in History of Science and Ideas at Umeå University as well as a scholar in Science and Technology Studies, started with a quote from Steve Woolgar, “It can always be otherwise/things can always be otherwise” in order to ask questions about the conditions and prerequisites which best



CHRISTER NORDLUND



KIM KNIGHT

fit young researchers within the area of digital humanities, and what best suits the development of that area.

Professor Nordlund wondered if, for the sake of quality, it would be best to be institutionally established in a traditional discipline/institution with “guest appearances” in the digital humanities, that is, to apply the traditional questions, theories, and quality criteria of the discipline to the digital humanities. Or would it be better to create a new interdisciplinary field, called digital humanities, which finds its own questions, theories, and quality criteria?

He also asked himself if in that case the university ought to be better at creating special environments, like HUMLab, and creating special forms of employment within digital humanities. Or would that risk losing some of the dynamism within the field? In order to clarify what he meant, he compared the development of the history of science, which had to fight to be accepted as a sub-discipline of history, with Science and Technology Studies (STS), where different approaches have been chosen at different schools, but which has as a rule sought interdisciplinarity and openness.

The next speaker **Kim Knight**, Assistant Professor at the University of Texas at Dallas, talked about her experience in Emerging Media and Communication, a program aimed at applying humanistic modes of inquiry to digital objects. She joined the program in 2010 and immediately found herself doing quite a bit of supervision for her students' capstone projects.

"Students were coming to me who wanted to work on issues of identity and social justice, but they had never had any coursework in this area. I saw a gap in our curriculum and this semester I am teaching new classes to help fill in," she said.

Dr. Knight started with readings on the concept of privilege. In thinking about connecting her field with the conference theme, she said, it seemed like that would be a good place to start, with the idea of privileged places and open and inclusive spaces. Digital humanities itself has its own registers of privilege and dis-privilege, she pointed out.

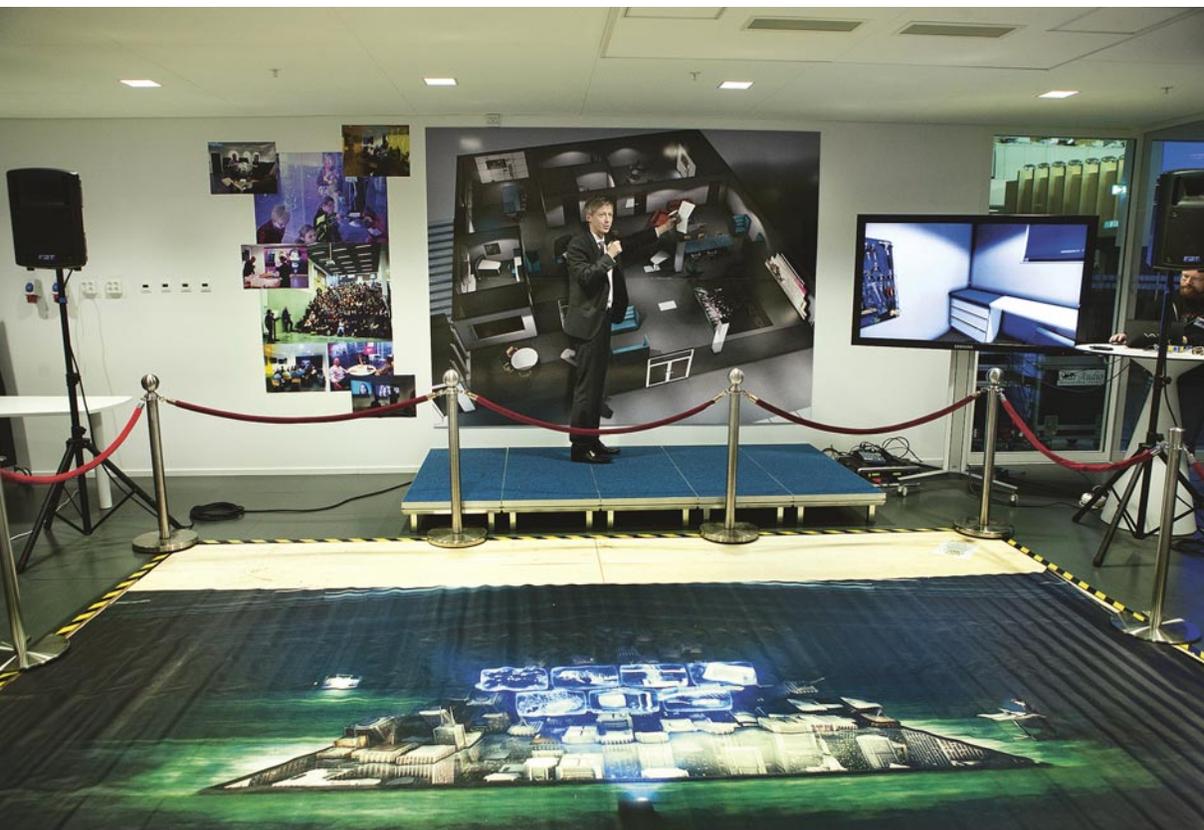
She referred to a short piece by the American damali ayo, writer and performance artist, called *You Can Fix Racism!* which describes different steps to address this issue. ayo's first step is the call to take notice and as people of privilege, you have to train yourself walk into a room and notice who is there and how people are being treated. In academia as well, we have to notice who is there, but also what kind of work they are doing, Dr. Knight stressed.

"And indeed, there are people who are already noticing," she said and mentioned Tara McPherson's work on race and UNIX, and Alan Liu's essay in *Debates in the Digital Humanities, Where is Cultural Criticism in the Digital Humanities?* and others. "But I think we can do better," she added.

She brought up the Emerging Media and Communication Program, which she said looks good on paper with a diverse student body, but which she said has some room for improvement.

"We have creative coder genius type positions held by men almost across the board while teaching and lab management positions are held by women, which reveals a pretty standard gender dichotomy. To some extent this is reflective of larger cultural patterns, but in EMAC we consider it our problem for us to solve with the students," she said. "So how can we create more open and inclusive spaces for them?"

Among several proposals, Dr. Knight mentioned something she currently calls the Open Creativity Lab or Studio, which will start



next semester. The idea is to create a space in which people feel free to experiment and fail, without over-privileging coding.

“Obviously I think it would be great if more people wanted to learn to code, but I do think that it is key that we not over-privilege it within this space,” she said. One of the reasons, she continued, is that she already knows that the students do not think of themselves as coders. There is a Ph.D. program with a coding requirement and many students express hesitation about applying to it because of this requirement.

“So the idea is to open up a space that is safe and inclusive; one in which all kinds of making and a diversity of experience are valued. Maybe in this space, students will learn to see coding as making and open up to the idea of themselves as coders,” she said and added:

“I hope that to move the field forward we will all commit to looking around at our privileged places, considering it our problem to solve.”



“Trying to understand what the future holds, I will go to the students to see: ‘How do they perceive the digital humanities,’” said **Thomas Nygren**, Doctor of History and Education, at HUMlab at Umeå University and working in schools and within the framework of a collaborative project with Stanford University financed by the Knut and Alice Wallenberg Foundation.

In two still unpublished studies, he has closely examined the transformation in infrastructure which digitization has meant for the creation of knowledge within history and the humanities.

“What we believe we are seeing, in practice-based research, is how digitization means great opportunities to collect large amounts of data, new empiricism, new visualizations, and with them a better social science approach to the description of history,” he said.

When students go to traditional archives their knowledge construction is more interpretive, contextualized, and hermeneutic. Dig-



ital archives instead stimulate quantitative, empirical “positivism,” Dr. Nygren said. It is also clear that the younger generation lacks particularly good skills in using scientific digital tools. You could say that today’s students are “Facebook natives” rather than “digital natives,” who can easily go astray among the abundance of digital information, he continued.

Working with **Zephyr Frank** at the Stanford Spatial History Lab and others, over the next few years Dr. Nygren will investigate how maps, visualizations, crowd-sourcing, and relationships between experts and the public can direct knowledge construction, within the



ZEPHYR FRANK

project Media Places, aimed at increasing understanding of how the new technology influences knowledge.

The challenge for the future, he asserted, is to better understand how new media and infrastructure for knowledge affect the science within different disciplines. To take advantage of the opportunity to use “big data” but to also stop and take a close look.

“We must realize that critical interpretive inspection is needed more than ever when the illusion of realism, for example visualizations, increases,” he pointed out.

We also need to be better at communicating and visualizing uncertainties, with enough patience to create many layers of perspective in the same place, so-called multi-layered deep-maps. It is a global challenge in the common field within the big tent called digital humanities Dr. Nygren underlined, and went on:

“But we need to have time, and we need to be slow – in this science that is really speeding us up.”



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Neural Connections

There is a rich and productive relationship between the humanities on the one hand, and neuroscience and the “neural” on the other hand, and we are starting to see more work exploring this intersection. This is of course not a new connection, as methodologies such as neural networks were used 15 years ago to enable a better understanding of how language and cognition work. That there is more research in this area now, is partly related to advances in neural and cognitive sciences, but also to the increasing number of humanists engaging with the neural, connective and algorithmic.

In her most recent book *How We Think: Digital Media and Contemporary Technogenesis*, Professor **Katherine Hayles** suggests that there is a co-evolution between humans and “technics.” Her symposium talk was a rich analysis of global trade systems and high-frequency trading, which have dramatically changed our financial systems. The trade floors are not where most of the action takes place any more, it has moved from human traders to automated trading algorithms. She pointed at how such trading systems rely on artificial intelligence systems operating at ultrafast speeds, partly taking the human out of the equation. Professor Hayles focused on the interface between the artificial intelligence in such systems and their human counterparts. 43

In her talk about economic infrastructures, she explored the complex interconnections between memory, speed, and capitalism in the context of the American stock markets. She described the rapid transformation of the US stock market over 5–7 years from the mixed human-machine ecology to the machine-machine ecology that is the norm today. As algorithms increasingly took control of financial transactions, not only did the relationship of humans to the global economic system change, but also the dynamics of the system itself.



“It has transformed the relation between capital, time and space,” she said. “The result has been a dramatic increase in the fragility of markets and the rise of uncontrollable instabilities that threaten to explode at any millisecond.”

Instant electronic stock transactions, and automated trading programs, rely on computer programs that automatically buy and sell stocks using sophisticated mathematical formulas, algorithms. The system is also called robot trading, once created and set in motion no human hand is involved in the transactions. In her talk, Professor Hayles described how American stock exchanges have moved the action from human traders to automated trading algorithms, a development which has gone extremely quickly. In the United States so-called high frequency trading, where computers buy and sell stocks in a few milliseconds, accounted for 75 percent of stock transactions in 2009. But dissatisfaction with high frequency trading has also increased, and the critics say that other participants are disadvantaged because they are slower in accessing the system.

The most disastrous effects, however, are the instabilities that high frequency trading introduces into the marketplace, she pointed out. These instabilities became shockingly evident on May 6, 2010, known as the Flash Crash. In the middle of the Greek financial crisis, with markets around the world nervous, a sell order, worth about 4 billion dollars, was placed by Waddell & Reed Financial in an automated trading system on one of the American exchanges. The problem was the order was placed using an algorithm that lacked certain critical restrictions on price-setting. Other automated order systems reacted instantly to the erroneous price-setting, and began massive sales of stocks to each other.

The situation snowballed, which led the entire American stock market to collapse. Within five minutes the value of stocks on the exchanges fell by more than 862 billion dollars. The Dow Jones Index dropped by 1,000 points in just an hour, and then bounced back again as if nothing had happened. Fortunes had changed hands in just a few minutes.

The Securities and Exchange Commission (SEC), in coordination with the Commodity Futures Trading Commission (CFTC), launched an investigation into the “Flash Crash,” issuing a report in September 2010.

“While the Flash Crash took only five minutes to unravel and recover, it took a full four months to figure out what happened,” said Professor Hayles. “The report focused on liquidity, blaming Waddell & Reed’s sell order.”

She mentioned that Mark Buchanan, a theoretical physicist who blogs on financial matters, refers to research by Eric Scott Hunsader, founder of Nanex. Hunsader followed the trades that Waddell & Reed made that fateful day, and his analysis suggests this plunge was caused by high frequency traders. That day’s volatility prompted them to dump their holdings to avoid losses. Hunsader concludes it was this selling, not Waddell & Reed’s passive orders, that caused the liquidity to disappear, Mark Buchanan writes.

The comments on Buchanan’s blog post are revealing, Professor Hayles went on, including one posted under the name “H_H_Holmes” noting: “The façade that the industry has anything to do with ‘people’ investing in ‘businesses’ is gone. All algorithms, all the time.”

“The anxieties such a situation can unleash are palpable, especially when we realize that almost everyone on the planet is likely to be af-



NATALIE M. PHILLIPS

fectured by these systemic risks to the global financial system posed by ultrafast machine ecology of dueling algorithms. There is, in a nutshell, no way out of the global interconnected system,” she said.

Automated trading systems embody evolutionary dynamics that can lead to unpredictable consequences and emergent behaviors, she continued. Humans may set up these systems, but they are not in control of how they operate, evolve, and mutate. The issue is not memory alone, but a transformation of global economic systems

that increasingly drive us toward, what she called, “vampiric capitalism” and away from social responsibility. While capitalism may be argued to have positive benefits e.g., job creation, innovation etc. along with the profit motive, in vampiric capitalism, these broader social goods are largely stripped away so that all that remains is the profit motive.

“How might humanists contribute to the increasingly precarious position into which these developments are leading us?” Professor Hayles asked. “While humanists are unlikely to be able to contribute to the debate about the regulatory reform of the stock markets, they can contribute, however, to discussions about the larger social purposes that finance capital is intended to serve. They can also help to put finance capital in an historical perspective and connect it with values such as social responsibility, fairness and economic justice.”

There is already a growing body of research that undertakes this task, she said, mentioning Ian Baucom’s *Specters of the Atlantic* on the connection between finance capital and slavery, and Karen Ho’s ethnography of Wall Street. She proposed that this emerging field, which at present lacks a name, might be called “Critical Studies in Finance Capital and Global Stability.”

But to be taken seriously in this endeavor, she pointed out, humanists will need to learn the vocabulary, mechanisms, and histories of finance capital.

“If there is no way out of the global financial system, then the way forward may require going more deeply into it. ‘Critical Studies in Finance Capital and Global Stability’ should be a project in which humanists claim their stakes and make their arguments, transforming it even as we are also transformed by it,” Professor Hayles concluded.

Natalie M. Phillips, Assistant Professor at Michigan State University, focused on a study of literary reading that uses brain-imaging technologies from neuroscience – fMRI, or functional magnetic resonance imaging. The aim of the project is to explore the cognitive dynamics involved when you are reading a work of literature with different levels of attention.

“Since I’m an English professor, who specializes in 18th-century literature, but who now runs MRI machines, it should be no surprise to learn that the project took shape in a unique set of interdisciplinary spaces and institutions,” she said, and mentioned the Stanford Humanities Center, international grant initiatives such as Duke’s



new Neurohumanities program and “Culture, Brain and Learning,” a collaboration project between Lund University and Stanford University, financed by the Knut and Alice Wallenberg Foundation.

The project has also led to the creation of a new lab at the English Department at Michigan State University, the *Digital Humanities and Literary Cognition* (DHLC) lab, which Dr. Phillips has co-founded. In terms of Literary Cognition, the DHLC is a space framed around a radically interdisciplinary model of cross-field engagement – one that seeks not to apply previous cognitive studies *to* literature, but instead to integrate humanist questions at the level of the experiment itself, she explained. This kind of work opens up new ground for concrete intersections among literature, neuroscience, and digital humanities, she maintained. Digital tools – particularly those used to map patterns in and across literary and artistic texts – may provide the key

lynchpin for bringing literature and neuroscience together in their full complexity.

“Simultaneously, tools from literary neuroscience have the potential to radically extend the impact and reach of digital humanities by reconnecting the field to the physicality of reading and the mind.”

The aim of the study is to investigate neural differences between two types of literary attention: pleasure reading and close reading. Pleasure reading allows a person to become immersed in a novel – “lost in a good book,” as Dr. Phillips expressed it. Close reading, by contrast, asks the readers to look at a novel’s structure, analyzing and deconstructing it as they go on.

The experiment used two neuroscientific tools in particular. The first technology, fMRI, gives a dynamic picture of blood flow in the brain – basically, where neurons, which need oxygenation, are firing, and when. This experiment also uses fMRI compatible eye tracking, which means you can see how people’s eyes are moving as they read. It helps track eye movements, including patterns of literary attention, and re-reading, Dr. Phillips said.

The experiment itself begins when the subject, a literary Ph.D. candidate, comes into the lab and begins reading Jane Austen’s *Mansfield Park*. The student then goes into the MRI scanner and moves through the entire second chapter sequentially.

“Throughout, we track blood flow in their brain as well as getting eye tracking and measures of heart rate and respiration. In each block they are instructed either to read normally, as in pleasure reading, or to read analytically, as in close reading,” she explained. “At the end, they get out, and we ask them to write a short literary essay in response to the sections they read closely for literary analysis.”

When the project began, Dr. Phillips explained, they expected subtle differences in brain activity in very specific regions. Close reading would probably activate regions associated with “work”, such as selective attention, cognitive control and memory. Pleasure reading would instead be expected to activate regions associated with “play”: i.e. enjoyment, emotional engagement and narrative transport. But what the researchers found was something else entirely: each style of reading can create distinct patterns in the brain that are far more complex than just work and play.

“What’s caught our attention is how much the whole brain seems to be transforming in moving between close reading and pleasure



reading, with close reading demonstrating an almost global activation across brain regions – to areas reaching far beyond those associated with attention and executive functions.”

One of the controversies raging right now, she continued, is a debate over the value of studying literature and majoring in the humanities.

“But for those who are interested, what this research suggests is that core skills in the liberal arts have immense cognitive complexity. Moreover, it’s not only the books we read, but also the act of thinking

rigorously about them that's of value, exercising the brain in critical ways across a wide range of brain regions."

The project using fMRI to explore literary attention has inspired a series of new projects in the DHLC lab, for example an experiment on empathy and trauma narratives and an emerging fMRI study on poetry and cognitive rhythm.

"In these cases, I believe that bringing together new tools and technologies from literature and neuroscience can energize both fields, adding a crucial piece to the larger puzzle we know as literary reading," Dr. Phillips concluded.

The last speaker **Molly Steenson**, Assistant Professor in the School of Journalism & Mass Communication at the University of Wisconsin-Madison, talked about artificial intelligence, which represented an important aspect of her analysis of the Architecture Machine Group that was founded by Nicholas Negroponte in 1967, which later led to the MIT Media Lab, the research laboratory at the Massachusetts Institute of Technology. She emphasized the strong connection between architectural thinking and the development of artificial intelligence.



Pre/post-digital Architectures

*Architecture is about form, both about the texturing and texturing of the form. It is not only about making buildings but also environments. Architecture turns spaces into places. The impact of digital technology and media is discussed in this session which was introduced with these words by **David Theo Goldberg**.*

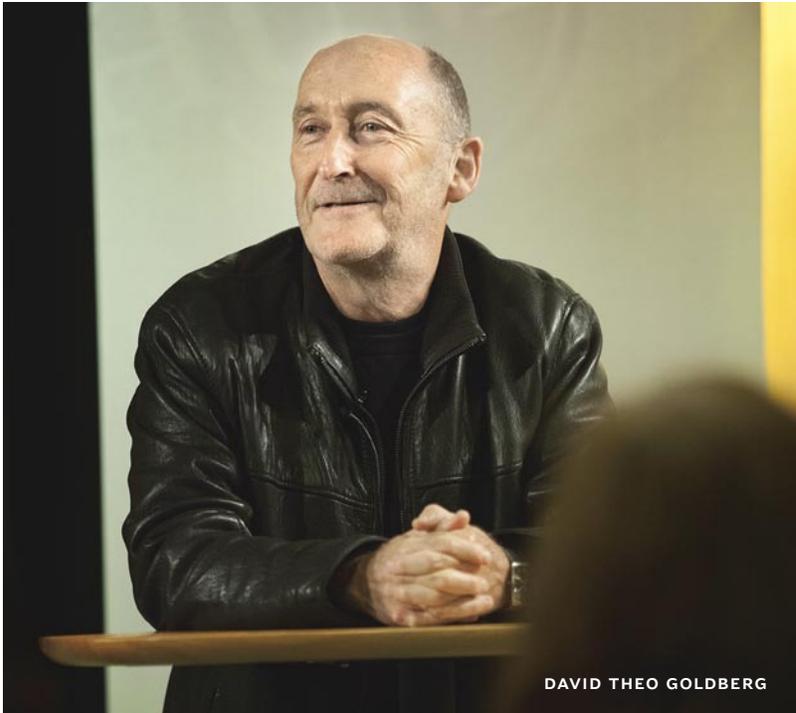
Finn Arne Jørgensen, Associate Senior Lecturer at Umeå University, gave a talk entitled *Cabin Porn for Digital Humanists*. The title refers to a website and an online phenomenon called Cabin Porn, filled with pictures of rustic cabins, usually in beautiful settings. He argued that this online exploration of offline cabins holds some lessons for the digital humanities. Cabin Porn is a visual culture phenomenon that attempts to define which cabins are authentic and which are not. It exposes the architecture of cabins, but hides the technical infrastructures that connect the cabins to industrial society. In this focus on the visual, we find parallels to a court ruling in 1964 when a judge made the following definition of pornography: “I shall not today attempt further to define the kinds of material I understand to be embraced within that shorthand description; and perhaps I could never succeed in intelligently doing so. But I know it when I see it.” In the endless discussions of what the digital humanities is, Dr. Jørgensen thinks that we will find a similar approach. 53

How can we think about the architecture and the infrastructure of the digital humanities? Architecture primarily refers to buildings, but is also a metaphor for thinking and reflecting about our practices. We see this in Cabin Porn, too. Beyond the simple aspect of looking at pictures, there are hundreds of cabin blogs, as well as a DIY builder culture. Through online practices, cabin owners even take ownership of prefab cabins. The thing that disappears in the online setting is what people don't like. Digital is frictionless, where people filter and block out what they do not want to deal with – and this is generally the infrastructure.

“As scholars we need to dig up and expose the infrastructure. That is what the footnotes in our texts are for,” he said. “And online, blogs and Twitter form an important back channel where people talk about how they do their work, where we see the process behind the final articles, books and tools we create.”

Dr. Jørgensen does not think that there is such a thing as the post-digital. We are in many cases taking the digital for granted. It is our job to expose the infrastructures that we take for granted, and to show how the digital and the material are entangled with each other. “At this conference, we have talked about the distinctions between hacking and making, between making infrastructure and hiding infrastructure. There is a value to both, but we need to be clear on why we choose one over another. That is why digital humanists should look at cabin porn,” he concluded.

Within the past half century a style of worship known as the “mega-church” has radically transformed the religious landscape in United States. Characterized by spectacular largesse, mega-churches reimagine the material culture of Christianity by blending audio,





visual, and communications technologies within postmodern architectures. This was the theme of the talk by **Erica Robles-Anderson**, Assistant Professor in the Department of Media, Culture, and Communication at New York University.

“I must confess that I didn’t come to church for the religion, I came for the media. But I did come for the communion in a sense as it became a really natural space to think about how people work together with technological objects,” she said, while showing images from Lakewood Church in Houston, Texas, one of the largest mega-churches. It used to be the Houston Rockets’ arena and can accommodate as many as 12,000 visitors at a Sunday service.

But it is a space now called the Crystal Cathedral, a mega-church in Orange County, California, which has attracted Dr. Robles-Anderson since 2006. She chose this particular object, she explained, because she was about to switch methods from her earlier controlled lab studies to fieldwork.

“I needed to have something that had a really strong theoretical argument, something that was recognizable to both communities, in order to pivot, and the church turned out to be really great.”

She talked about the Crystal Cathedral, an extraordinary large glass space, twelve stories tall, looking more like an office complex than a traditional place of worship. The Crystal Cathedral is part of the Reformed Church, the oldest Protestant denomination in the Americas, perhaps, she said, not what you would expect. But this church uses all kinds of media technologies, with extraordinary audio capacities, jumbo plasma screens, and the congregation was an early adopter of the Internet and Twitter. So how did God get into this mix?

“One of the things that the historical background gives me,” she said, “is the sense of not seeing this as an uncanny and strange thing, something that the church should not look like, but instead crossing time and considering the Protestant Reformation, taking seriously what it means to constantly reform.”

It has reformed so much, that when you get to a church like this there are no longer Bibles or hymnals – the canonical technologies we assumed were the agenda for change bound up in a reformation project, she continued. Instead it is jumbo plasma screens, which everyone looks at together instead of reading the same text on their own.

Dr. Robles-Anderson then traced the trend back to an earlier, maybe forgotten moment, drive-in movie theaters, in the period after World War II, when you took your car to watch movies. When the congregation couldn’t find a suitable locale to rent in Los Angeles, they were able to use a drive-in theater for Sunday morning services, and became what she called a “drive-in church” in 1955.

“It became a place to think about screens in churches as something that maybe was already in play with the windshield and a bunch of people co-orientating. In the family automobile it was like a family pew.”

The church that she is looking at has reinvented itself many times – like an experiment. From being a drive-in church, it became a walk-in/drive-in church from 1961 until 1980, when construction started on the Crystal Cathedral. Members were asked to donate by buying pieces of the pipes or a piece of glass, etc., to make something that became a very symbolic place of worship. The donors each also

received a small piece of glass to take home, reminding them that they were connected to something important.

The huge transparent glass walls of the church were intended to break down the barriers between interior and exterior.

“I have done a lot of work on what it means to be in a church where you can watch each other and peripherally know you are being watched and have a fulcrum of something like a coordinate-connecting mechanism. Like the pastor, who everyone can look at,” Dr. Robles-Anderson said, adding that the congregation had always been very public, including the first nationwide television broadcast of a church service in the US.

When you think about an architecture that should not be there, to the modern eye, it is not so much that the church is out of place as much as the modern eye is always telling us a story that actually has some flaws in it, she continued.

“We tend to think that when you become more technological you also become more secular. So groups that really grab something like this, and keep grabbing it repeatedly, remind us that some of the more pressing questions for being something humanistic, is to make things connected that were never actually apart. The reformation project is always dependent on the fiction that you can get the message any way you want to, through any media.”



PATRIK SVENSSON

Infrastructures

In our everyday context the word “infrastructure” is typically used to refer to things such as roads, electricity and computer networks. Infrastructure is essential to the operation of a society but to some extent transparent or even invisible, when it works you normally do not pay much attention to it. However, if it does not work – interferences on phone lines or delays in train traffic – it becomes very noticeable and disruptive.

Throughout the symposium infrastructure was an important topic of discussion, whether it was about libraries and classification systems as infrastructure for knowledge, toolkits as infrastructure for making do-it-yourself electronics or the underlying infrastructure of global trade with the use of automated trading programs.

“The underlying rationale behind my talk is that it seems like the humanities do not necessarily have a clear and systematic idea about their infrastructure.” **Patrik Svensson**, Professor and Department Head for HUMlab at Umeå University, identified several problems with the infrastructural agenda as often articulated for the humanities. 59

We downplay the importance of the spatial and material, and do not necessarily tie infrastructure to conceptual underpinning, he said. We do not connect infrastructure strongly to the challenges of the humanities as a project:

“And we do not have an agenda for how to make this work politically, socially and culturally,” he went on. “Maybe this sounds a bit harsh and probably somewhat unfair, but my main point is that the humanities need to set their own infrastructural agenda.”

Professor Svensson argued that it is important both to engage critically with the discourse of infrastructures, and to be involved in conceptualizing and building infrastructure.

His main interest is academic infrastructure and what is often called research infrastructure. Other related concepts are cyberinfra-

structure and e-science. Academic infrastructure, he said, is typically structural rather than scholarly, but significant in different ways – which is shown not least in terms of investments. It is often supported by universities, governments and funding agencies, mostly in science, technology and engineering. He used the European Spallation Source (ESS), which will open in 2019 at Lund University, as a current example. ESS is an interdisciplinary research center, based on the world’s most powerful neutron source, where researchers will be able to study the materials of the future. The facility is being financed jointly by 17 countries, and is a major investment of 1.5 billion euros. The Swedish government and funding agencies prioritize nationally or internationally relevant infrastructure that is useful for the good of the country and research in general, he maintained.

“As this example illustrates, infrastructure is situated materially, spatially and additionally socially and politically. I would also like to add that it’s situated conceptually.”

The concept of research infrastructures has not been stable; there have been many different waves and interpretations over the years. From about 2000 we have been dealing with a research infrastructure that is more inclusive, with more focus on people and – at least on paper – more inclusive in relation to the humanities and social sciences, Professor Svensson said. A good example is the 2003 US National Science Foundation cyberinfrastructure report, *Revolutionizing Science and Engineering through Cyberinfrastructure*, with a particular kind of discourse, full of hope, belief in technology and strategic and political of course.

So where do we find the humanities in these reports? Unsurprisingly that is not a central issue, said Professor Svensson, who gave several examples from the Swedish Research Council’s Guide to Infrastructures (2012). The observation he has made is that humanities are dealt with on an aggregate level – not really related to the disciplines themselves.

“There is a focus on archives and on access and making (material) available, preferably via the web, digitization and standardization,” he said. “This is important, but it is not the only kind of infrastructure the humanities need. In some ways it is more the domain of libraries and data centers, more materials than scholarly tools.”

He gave further examples from the American Council of Learned Societies’ report *Our Cultural Commonwealth* (2006), which focuses



on digitization and access rather than other properties of memory institutions. The ACLS report also says that we basically can use much of the science and engineering platforms, if we tweak them a bit, Professor Svensson went on. He quoted from the report:

“Software toolkits for projects involving data-mining and data-visualization could be shared across the sciences, humanities, and social sciences, but only up to the point where the nature of the data begins to shape the nature of the tools.”

“This is not unproblematic to me, it has to be aligned very early on,” he said and added a quote from 1999 by Johanna Drucker: “I cannot say this strongly or clearly enough: The design of digital tools for scholarship is an intellectual responsibility, not a technical task.” Professor Svensson argued that while the technology is important and we need to allow for technological engagement, we also need to start from humanistic research challenges, methodologies and ideas about what the humanities are and could be.

“We must have places where all this can happen and be manifested, and we need to package humanities infrastructure in such a way that



it's humanistically grounded, but also involved in changing or tweaking funding structures and political agendas."

Digital humanities laboratories could be one kind of packaging, he suggested, and useful models for humanities infrastructure. The laboratories can be more or less physical and more or less digital, relating to all of the humanities but to the rest of the university as well, he stressed. For him HUMlab in Umeå is an inclusive meeting place or trading zone for the humanities, culture and information technology.

The humanities lab can house a number of different methodologies and tools, allow for multiple points of interaction and for making critical work which is essential to digital humanities.

"It can also enable and facilitate new research and challenge the disciplines," he continued. "Another advantage is that it can manifest the university as a place for dialogue, intellectual rigor, excitement and out-reach."

He concluded with a brief recollection from a conference on humanities cyberinfrastructure, in which he took part, in the United States in 2006. Dan Atkins, the then-head of the National Science Foundation Office of Cyberinfrastructure, said that the humanities need to show leadership.

"I think this is still the case, this is why I am here."

An important point is that infrastructure, although sometimes opaque or difficult to observe, is not neutral. As **Jo Guldi**, Historian of modern Britain and Junior Fellow at the Harvard Society of Fellows, made clear when she talked about Britain becoming an infrastructure state that came to underpin the industrial revolution. She discussed infrastructures as utopian ideas, and three forms of infrastructure as revolution: the paper revolution, the transport revolution and the information revolution.

“Internet users around the world rely on undersea cable systems for media exchange, but have little recognition of the structures of dependency into which they are locked. The availability and pricing of these exchanges can be manipulated by relatively few companies and many governments have the ability to shut down their external telecommunications.”

Those comments from **Nicole Starosielski**, Assistant Professor at the Department of Media, Culture, and Communication at New



York University, underlined the message of her talk *Where Networks Work: Undersea Cables and the Geography of Media Infrastructure*.

“More than 99 percent of our transoceanic data traffic, from emails to text messages, from YouTube to Skype conversations, is carried between the continents by undersea cables,” Dr. Starosielski said. The geographic dispersion of global transmission routes is relatively sparse and remains centralized in key locations. Many countries’ external links number less than five. This concentration is due in part to the enormous capacity and expense of each system.

She also maintained that although it is an assumption that digital communication is being freed from territorial limitations, in fact cable routings have been critically shaped by territorial politics. Overall, this geographic stasis is also a reflection of what she called a fundamentally conservative cable industry: cable technologies are designed to last twenty-five years and installation techniques have changed little since they were developed. She brought up the cables connecting New Zealand to the outside world as an example, they are located in the same areas as telegraph cables from the early twentieth century.

“While our digital environment appears as a space of mobility, radically changing every few years, the backbone for the global Internet continues to be sunk along historical and political lines – this means that cable networks often tend to reinforce existing global inequalities,” she underlined.

The relative centralization of undersea cables and their embeddedness in existing territories makes the global segment of our signal exchanges vulnerable. As examples, Dr. Starosielski pointed to an earthquake near Taiwan in 2006 that snapped several cables, shutting down the Internet, and pirates in Vietnam, who in 2007, pulled up two of the country’s lines.

“Cable systems require a significant amount of time, energy, and labor for sustainability, without which the infrastructure would soon fail.”

The Internet is often imagined as a “clean” and durable technology, something that will eventually be extended everywhere. This vision doesn’t take into account the extensive financial, social, and environmental costs of maintenance and the necessity of state support for many new projects.

“Taking that into account, we will not think of the Internet as a renewable resource but as a precarious platform. Especially as moving

the data into the cloud often increases the dependence on undersea links,” Dr. Starosielski said.

Studies of networks also tend to focus on the city, as it has been intertwined with the development of information flows. The majority of the undersea networks’ routes and pressure points are nestled among “natural” environments, and the system has been profoundly shaped by the politics of rural, remote, and island locations, she said. Even though fiber-optic cables can span the Pacific in a single hop, many of the stations are still located on islands.

She pointed out that there are more landing points on Hong Kong and Taiwan than on the entire mainland of China.

“The existing geography of signal traffic tends to reflect and perpetuate historical inequalities. The precariousness of cable links further reinforces this inequality, as it accentuates a divide between countries that store their own content and countries that depend on undersea cables to access it. Recognition of these issues can give digital media-using publics a better understanding of their own position in a spatial and environmental Internet, as well as its extraordinary costs.”

Dr. Starosielski concluded that looking at cable geographies gives us an alternative imagination of network infrastructure. “Looking at our networks from the perspective of distribution might affect how we conceptualize media policy and politics, the forms of participation we envision, and the modes of consumption and access we advocate. We must start with this recognition, if either as users, citizens, or policy makers, we desire to create a more genuinely distributed, resilient, or equitable network.”



SHEILA KENNEDY

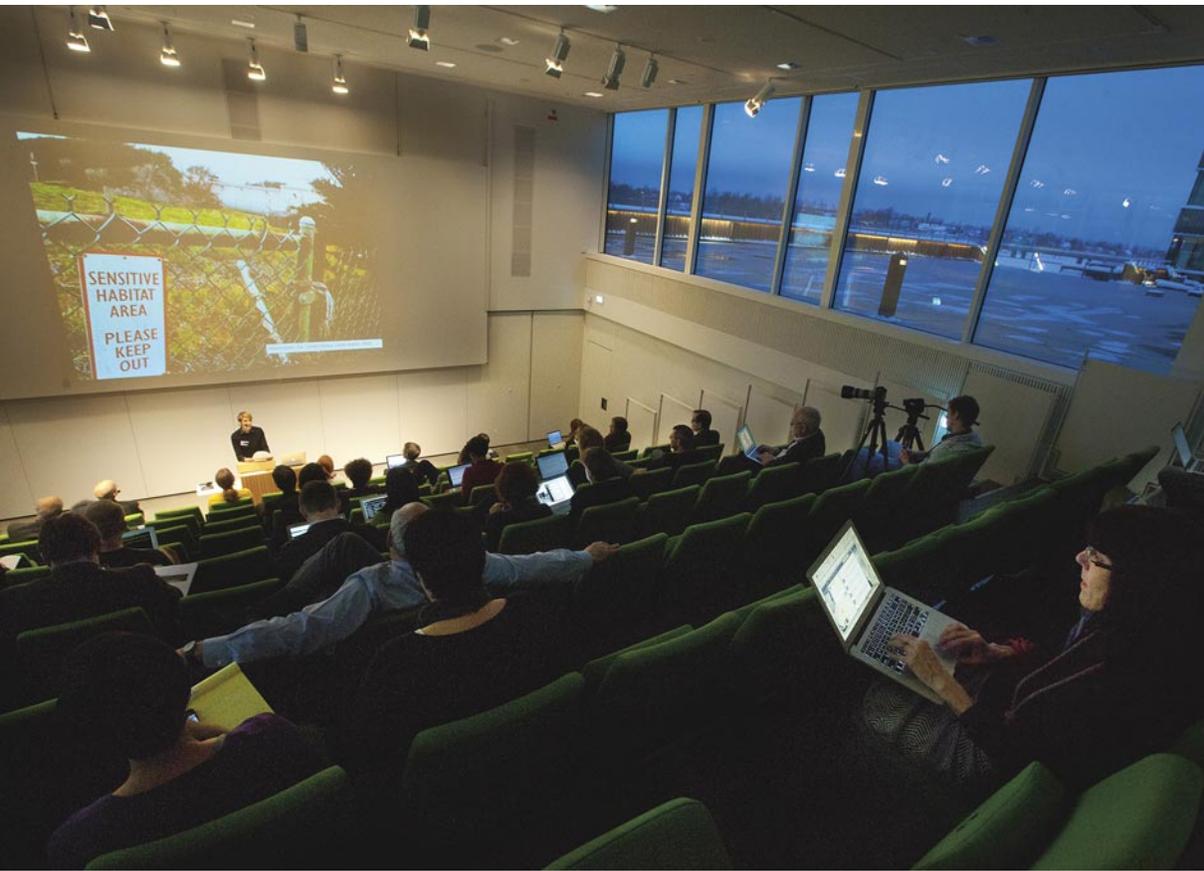
Space/environment

There has been a recent upsurge in the field now commonly known as “environmental humanities.” It derives from an increasing demand for human and social research, and knowledge to meet global challenges such as climate change and the need for a sustainable development. Meanwhile, environmental aspects and sustainability are becoming increasingly important to architecture and urban planning. By bringing together leading architects, environmental humanists and media theorists, the session on space and environment tackled some of these critical issues.

In her talk **Sheila Kennedy**, Practicing Architect at Kennedy & Violich Architecture (KVA) and Professor of the Practice of Architecture at the Massachusetts Institute of Technology (MIT), provided a whirlwind “tour” of electrical “materiality,” identifying productive material predicaments as contemporary digital networks are overlaid on the modern infrastructure of electricity.

Professor Kennedy compared the early modern *Maison Electrique* smart house of 1910 in France with the Soft House, a contemporary smart housing project designed by KVA in 2010 for the Internationale Bauausstellung (IBA), a well-known German architecture exhibition. The *Maison Electrique*, (the Electric House), built by the engineer-inventor Gëorgia Knap in Troyes, France, was designed with robotic architectural elements. Visitors admired what were considered to be amazing technological advancements in the house, such as garden doors opened by an electric bell and a dining table with a race track around it for the plates, which, after dinner, descended into the kitchen. The electrification and new integration of domestic furniture and infrastructural elements transgressed social divisions of class and the architectural conventions of section in the served and servant spaces within the house.

The *Maison Electrique* was not a commercial success and was closed by 1913. Professor Kennedy asked: does an architecture that mediates



electricity or digital networks simply become another disappearing act? Is the project of architecture today set aside in favor of technology and its elaboration? Or could we understand the *Maison Electrique* as offering a set of new possibilities for reconsidering boundaries between interior domestic space and exterior climate, a play between nature and media that may be relevant in our contemporary culture of distributed infrastructure and digital networks.

“The *Maison Electrique* was filled with novel, electro-mechanical devices, but the most remarkable thing about it was the garden,” she related. “Heated with electricity, the garden produced huge flowers of phenomenal dimensions, even in winter - it was always described in supernatural terms. And it is the paradox of this garden - that electrical media can be ‘naturalized’, and that natural materials - in this case the ‘exterior’ materials of the garden - can be mediated that has

been a source of inspiration and critical inquiry for my design work and my research work at MIT.”

Professor Kennedy then presented the Soft House project by her bureau KVA MATx which won the IBA competition. In 2013, IBA is organized to build new models of sustainable living that can jump-start the planned urbanization of the Wilhelmsburg area of Hamburg.

In the Soft House, she related, the KVA MATx design team created new relationships between “exterior” domestic energy infrastructure and “internal” space making smart furnishings in a responsive architecture that exceeds Germany’s passive-house energy standards. Her design team asked, “What if we could knit a domestic infrastructure? We worked with a familiar domestic 19th century furnishing, the curtain, and augmented its traditional shading and insulating roles — by using the curtain to provide lighting and distribute the energy collected on the exterior.”

The idea was to create, what she called a simple and enduring architecture with two sets of smart textiles. She said: “It’s a different idea about time scales where architecture is much more permanent and the infrastructure is mobile.” A solid soft-wood structure sequesters carbon and a movable textile infrastructure harvests solar energy and provides solid state lighting. On the exterior, a responsive photovoltaic textile façade adjusts to sun orientation, creating a soft two axis solar tracking system that harvests sunlight for energy. The smart curtains used inside the housing units travel on curtain tracks, which distribute clean low voltage DC electricity generated by the membrane façade on the outside of the building.

The moveable curtains are of a computer fabricated knit of transparent and reflective strips with LEDs that allow residents to partition the interiors themselves, and change the layout as they wish. They also help the residents to regulate heat and warmth within their own homes. “The curtains create a micro-climate because the textiles reflect the heat or the cooling from the earth heating or cooling back in on itself,” she explained.

In conclusion she returned to the *Maison Electrique*, talking about the idea of trying to see whether some earlier historical projects could have new traction going forward.

Two ideas are key: design that enables the interaction between physical materials and digital networks, and resilient infrastructure

that can adapt to new conditions over time – using multiple, renewable energy sources that can work together and interact, creating new spatial relationships. “In this project we tried to provide a set of ideas about an electrical and digital corporeality where architecture would not have to disappear in the face of technology. But you would have instead a new synthesis of domestic architecture and digital technology that is sentient, soft and resilient.”

One of the pioneers in the area of integrating technology into environmentally and socially conscious design is **Jennifer Gabrys**, whose influential book *Digital Rubbish* examines the multiple forms of waste created by electronics. Dr. Gabrys talked about smart cities proposals that put forward visions for cities as digitally connected and environmentally sustainable. She examined the types of practices that emerge as indicators of sustainability in smart cities, and asked how it might be possible to develop other types of urban and computational imaginaries that allow for more democratic modes of urban participation. While smart cities projects are presented as governmental initiatives to enhance infrastructure, these developments are also enrolled in commercial-political agendas. Citizens might





have new ways of engaging in cities through participatory media, but they become data points at the same time. How does urban governance change when technology companies such as Cisco, IBM or HP play a primary role in managing the data and functionalities of urban infrastructures and processes?

Jennie Olofsson, Associate Senior Lecturer at HUMlab, Umeå University, provided a related but different perspective by looking at the life of screens. Screens are an increasingly important part of our everyday life and are embedded into a variety of products, including cell phones and refrigerators. Dr. Olofsson talked about her work investigating what makes a screen a screen and the life cycle of screens. One vital aspect is the end-of-life treatment of electronic waste. She argued that policies, like recycling guidelines, and practices are not neutral or given and therefore can raise ontological questions such as *what is a screen and when does it cease to be a screen?* The indication then, is that the objecthood of the screen cannot be taken for granted.



Contingent Architectures

Urban communities at the heart of the 21st century are increasingly media rich and globally connected. Large digital and interactive urban screens are becoming embedded into our architecture, used for advertising and local information, as well as providing public viewing access to cultural and sporting events. This has led to a shift in how we think about public space and its social importance.

With this introduction, Architect and Researcher **Ava Fatah gen. Schieck**, The Bartlett, University College London, opened her session and spoke about *Digital Media, Urban Public Space and Participation: Embodied, Mediated and Networked*. She gave several examples of artists' work in urban space that calls for participation, and showed a recent example of media enabling participation in the city, i.e. during the Architecture Biennale 2012 in Aarhus, Denmark, where citizen data was projected on the City Hall tower. 73

"Allowing us perhaps to have an awareness," she said, "but also some confusion, which is potentially important to have as we start a dialogue with digital media in our urban spaces."

Going beyond local interaction, urban screens are being networked, allowing two-way remote communications, something which has long been used in the world of art. She also referred to Telectroscope, an art installation by Paul St George in 2008, which through its use of videoconferencing technology provided a visual link in real time between London and New York.

This technical ability to enable connectivity now raises many questions about how the public will experience both the urban space and the mediated urban interactions enabled through this infrastructure, she pointed out. In the ongoing project *Screens in the Wild: Exploring the Potential of Networked Urban Screens for Communities & Culture*, she and the research team, in collaboration with Mixed Reality Lab in University of Nottingham, are exploring how to best



integrate a radical and potentially disruptive technology in the urban realm. The approach is inherently cross-disciplinary, bringing together methods from Architecture, Interaction Design, Anthropology, and Computer Science.

“The methodology is based on action research, unlike lab conditions where you set the conditions, saying ‘this is what I am exploring,’ we literally use an iterative design and urban prototyping process and develop the different components within the context itself, but with the people and the communities mediated through these technologies,” Ms. Fatah gen. Schieck explained.

In the project, the research team installed four connected and interactive urban screens, two in London and two in Nottingham. In London the screens are at a library building and a community center, and in Nottingham one is at an art center, and the other at a digital media center. This set-up allows the team to explore remote connectivity by comparing two, three or four networked nodes, creating

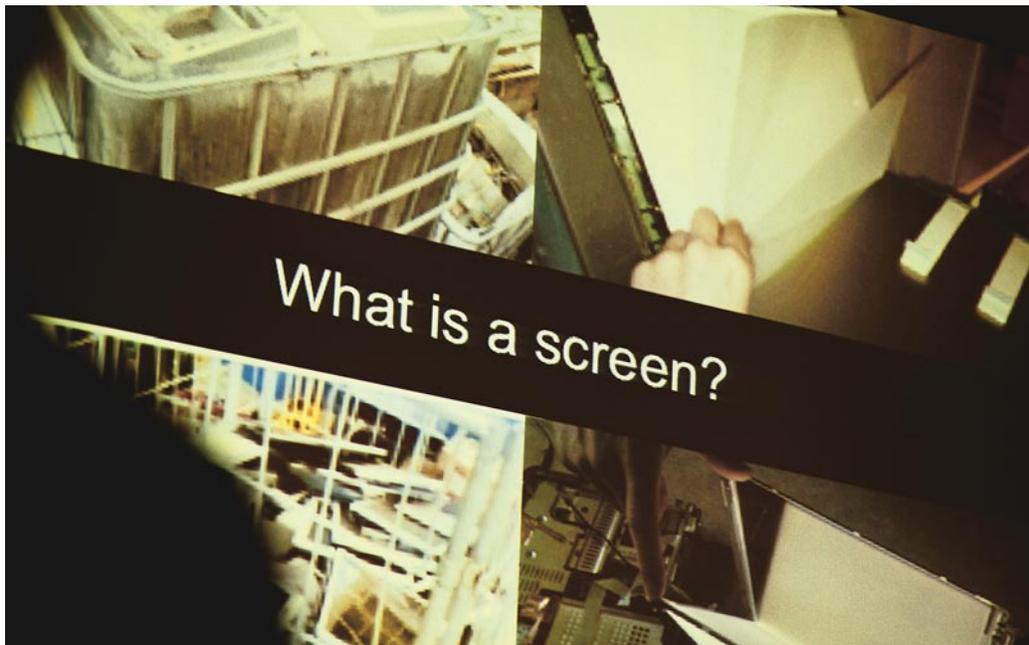
situations and experiences that differ in their urban settings and the types of populations they support.

The screens are installed behind external windows, each consisting of a public display fitted with a touchscreen (Touch Foil) and a speaker, both working through the glass window. There are four live video feeds implemented at the bottom of the display. A curious passer-by, in London, for example, can stop and try touching the glass on the screen or use touchless interaction such as body movements, and in that way interact with someone in Nottingham.

“We could also explore a kind of Sound Shape, where you can generate different sound patterns with somebody else – either in the same location or with somebody in a different location. In the lower part of the screen you find a video feed where you can see when you are interacting with someone else at the other location. Or maybe you are just passing by and see the activities taking place.”

The project also uses social media, like Twitter and Instagram, for content creation, and, for example, putting one’s own images on the screen.

The objectives of the experiments, she explained, is to understand how the public will interact around and through these connected



screens and how different social groups will appropriate technology under different spatial conditions. Regarding the technical aspects and the design of interaction space, the team explores the impact that various interaction modes have on the public experience. Another research challenge is to understand how screen managers can manage access, and the filtering of content that will help promote community empowerment and engagement.

“There is a dialogue between the content, the context, the place itself and the interactions,” she said. “Another important question is engagement. How can we make people from diverse communities part of the process and encourage them to create the content?”

The researchers have conducted several workshops, engaging with different age groups such as the Toddlers, Tech-teens and Adults from the Knitting groups, to explore what kind of reactions the participants have as they begin interacting.

“To get access to, for example, Instagram, the participant needs a smart phone, but some of the screens’ locations are in a deprived area, where not many inhabitants have one. We aim to enable interactions in a simple way, for instance one of the experiences is generated through a photo making application where you can just touch a button. People can then take photos and display them on the screen from the various locations in real time.”

In conclusion, Ms. Fatah gen. Schieck highlighted some challenges for urban screen design, for example the dynamic nature of various urban situations, lighting conditions, technical suitability, and weather conditions must be taken into account. She also mentioned the importance of managing expectations and stakeholders’ interests.

“In our first discussions with stakeholders some of them saw our screen as a giant iPad where you can have business directories, because that was what they wanted. But this perception changed over time as we placed the content.”

She also pointed out that new situations trigger new forms of interfaces or other uses of existing ones, and that involvement is important, especially to create relationships over time.

“But the most interesting part is that the system will likely be used and appropriated in different ways than the designers initially anticipated. This makes it very exciting, at the same time and as part of the iterative process, we try to understand in order to form the next steps.”

Framing

The symposium took place in a screen-rich environment, which can also be used as a lead in when discussing frames. Although frames are not necessarily what we first think of when we see screens, they are essential to our perception, understanding and use of the screens. In one part of HUMlab in Umeå, used for the symposium, there are eleven screens positioned around the space. This is a very different arrangement compared to having one large screen, and also a deliberate framing in response to work with rich historical and cultural contexts. Imagine, on a very simple level, the difference between a group of people sitting down, being presented with a series of slides on a single screen, and the same group of people walking about and interacting with multiplex materials presented simultaneously in a multi-screen environment. In this session the speakers looked at framing and screens historically, also making the point that architecture is often invoked as a frame and that this is part of the grand historical role of architecture.

To date, historians have ascribed the rise of multimedia in the 1960s 77 to the convergence of new media technologies and countercultural utopianism. In his talk, however, **Fred Turner**, Associate Professor in the Department of Communication at Stanford University and Director of Stanford's Program in Science, Technology, and Society, traced the origins of that convergence to the most unlikely of sources: World War II. Building on five years of archival research, his talk recalled the widespread 1930s fear that mass media produced what would later be called the "authoritarian personality" and with it, fascism. As Americans prepared to enter World War II, their leaders hoped to exhort them to confront the fascist menace. But how could they do that, they wondered, if mass media turned the psyches of their audiences in authoritarian directions?

Dr. Turner began his talk by showing pictures of two different



multi-screen environments. The first from the 1960s, by the artist Stan VanDerBeek, was from a dome installed in the top of a grain silo, which was meant to be a media outpost. VanDerBeek wanted to bring viewers into his dome, put them on the floor and then beam images from around the world at them in such a way that in watching they would come to understand themselves as global citizens, as independent actors integrating media, he explained. VanDerBeek imagined a whole network of these domes around the world and he was not the only one with such ideas. Other artists, especially in 1966-68, were designing multimedia environments for the production of a kind of new, free and cosmopolitan self, he said.

The next multimedia environment Dr. Turner presented was “Glimpses of America,” Charles and Ray Eames’ huge seven-screen presentation for the American National Exhibition in Moscow in 1959. The slideshow was projected inside a massive golden geodesic dome. According to him, this is a classic democratic surround designed by the United States Information Agency with the Eameses to give Soviet citizens the semiotic experience of choice.

“They were to look at these seven screens and think ‘Wow, America, it has so many different parts.’ It was accompanied in this case by an enormous consumer display, all kinds of goods that Americans hoped that the Soviets would develop a longing for.”

So, where do these things come from? These two multimedia environments should not be similar, he said, who was taught that the 1960s were a rebellion, a revolt, against the 1950s and Cold War America. How is it, he asked, that a quintessential Cold War display and a quintessential counter-cultural display could have shared the ambition of sharing a new kind of democratic view devoted to choice and selection, devoted to becoming a cosmopolitan world-surfing citizen?

Trying to answer that question he has been rummaging through archives for the last five years and has just finished his book *The Democratic Surround: Multimedia and American Liberalism from World War II to the Psychedelic Sixties*, how the fear of multimedia brought us the psychedelic 60s.

“It turns out that this surround form, this multi-image screen form, coupled with its political intent to produce democratic citizens, is something that emerges at the start of World War II out of the fear that mass media would literally make us fascists.”

As America entered World War II we were haunted by the question of how Americans could make media forms that would promote a “democratic character,” Dr. Turner said. He described how a series of social scientists, Bauhaus artists and American political leaders sought to create a mode of multimedia display, a multi-image, multi-sound source display; to help produce what they thought would be a democratic personality, a mode that he called “the democratic surround.”

One of the most influential groups discussing this issue in 1941–42 called itself the Committee for National Morale, featuring leading writers and thinkers like Margaret Mead, Gregory Bateson and Gordon Allport. They began to theorize what democratic character might be and what kind of media might produce it. Gordon Allport, a leading member of the group, wrote an essay in 1942 called *The Nature of Democratic Morale*. This was in a time when there was a fear that fascist morale could be especially influential because fascism prompts everyone to move in lockstep and in doing so gives them a feeling of being extraordinarily powerful, Dr. Turner reminded his audience. Allport says: “In a democracy every personality can be a citadel of resistance to tyranny. In the coordination of the intelli-

gences and wills of one hundred whole men and women lies the formula for an invincible American morale.”

He argued that for Allport, and for all sorts of Americans of this period, World War II was quite literally a fight for personality.

“It was a fight for a new way of being a whole person, able to choose, able to connect with others unlike you, a tremendously anti-racist push and a time when queer or unusual politics were much more open and public than I ever thought. A very, very powerful period,” he said.

The members of the Committee for National Morale were convinced that they needed to make this pro-democratic personality media, but the problem was that they were sociologists and did not make media. Fortunately, at that same moment in Manhattan, there was a group of refugee Bauhaus artists, including László Moholy-Nagy and Herbert Bayer, who helped transform the social scientists’ ideals into reality.

The Bauhaus refugees had an extremely developed theory of multimedia environments and they needed work. They had developed their theory to produce what they called the “new man” in Weimar Germany, he explained, a new man able to stay psychologically whole in the face of industrialization. They were very happy to offer that model to an America in wartime that needed to keep its personality whole in the face of fascism. The new man in this period became the democratic man, Dr. Turner continued.

One of the Bauhaus artists, Herbert Bayer, was a museum exhibition designer who developed new modes of display at the beginning of the 30s. Until this period, museum displays tended to be sequences of images aligned linearly. Bayer wanted to offer a more experiential sort of space in which “a person can practice integrating images from all sides and then be able to practice being whole in resistance to the kind of bombardment and sensations that industrial culture provided.”

“In his design there were images on the wall, on the ceiling, on the floor; and what he wanted to do was to create a visual environment in which the individual could take perception, and use perception to knit together an experience of himself as a whole selecting person,” Dr. Turner said.

In World War II that mode and that design became the basis of a new kind of propaganda, he continued. One of the places where it

was influential was the exhibition called *Road to Victory*, created in 1942 by the photographer Edward Steichen with Herbert Bayer. What was distinctive about this exhibition was that there were images of all sizes, some of them over the viewer's heads, and all blown up out of proportion.

"It's a space in which you become surrounded by images that have been selected for you, that orient your attention toward an American political project," Dr. Turner explained. "For people in this period – I can't stress this enough – this is a very new experience. It allows them to experience themselves differently."

This is the politics of the democratic surround, Dr. Turner argued, the politics of identification for political purposes. There was a great response to the exhibition in the press, and one of the reviews he cited was from the *Springfield Sunday Union*: "*Road to Victory* does not mold the visitor's opinions, for that word smacks of the fascist concept of dominating men's minds. This is a system designed not to dominate your mind, at least in theory, but rather to place you in a position where you can make the kind of choices upon which democracy depends. You can act psychologically as an individual in the company of other individuals building a unity around a shared project."

"Now in our own time, of course, I think we see another piece at work here," he said. "And that other piece is the process in which these images were selected for us. We have choice but we have choice in an environment that is been constructed for us. So this is simultaneously a push back against fascist aesthetics, and a real liberating step away from mass media and fascism. But this is also the beginning of a managerial mode of power as opposed to a dictatorial mode of power."

This is something those of us who make multimedia environments should be very aware of, he said. It is not as if we have stopped exercising power, we just manage it differently.

About eighty thousand people came to see the exhibition *Road to Victory* at the Museum of Modern Art (MoMA) in New York.

"It's the World War II moment in which things really changed. The impact of this new form is extraordinary. I would never have guessed that a single museum exhibition would have the impact that it did," Dr. Turner said. "And I did not have any idea that this kind of environmental space would then serve as a model for a whole series of exhibitions and artistic events that lead all the way to the 60s."



SYLVIA LAVIN

One track that it takes, he continued, was directly from *Road to Victory* to the most widely seen photographic exhibition of all time, *The Family of Man*, which was seen by a quarter of a million people at MoMA. It has travelled around the world non-stop since 1955 and now has a permanent home in a castle in Clervaux, Luxembourg. The show was designed by Edward Steichen in terms set by Herbert Bayer. The images were literally mounted in the ceiling and on the floor, in a design to help us see ourselves as part of a global citizenry, Dr. Turner explained.

That in turn led to a series of World Fairs, and commercial exhibitions, he went on, with the same mode of display. Yet another example was a 1964 show by the Eameses called *Think*, modeled after a design by Herbert Bayer.

“Remember this is 1964 in Manhattan, the same place where happenings are starting to happen at that very moment. Now, this is a

trajectory that's somewhat familiar, a trajectory of propaganda, propaganda of World Fairs, a very mainstream sort of America."

Dr. Turner concluded that the multi-image screen designs shaped *The Family of Man* exhibition at MoMA, and even the international Cold War propaganda efforts of the United States government. The democratic surround work of the Bauhaus artists helped bring us the quintessential art form of the 1960s, the Happening, and through it, the person-centered ideals and multimedia aesthetics of the American counterculture – and of our own time, he argued, using the 2010 Consumer Electronics Show in Las Vegas as an example.

He underlined that Cold War historiography is important, and pointed out again that he grew up fully believing that the 1960s were a rebellion against the 1940s and the 1950s.

"There are ways in which, of course, that is true," he said. "But there are also ways in which the people, who have told us that story, have written out of our memories a far more open 1940s and 50s than we ever knew. What I want to say is that the 60s were not a rebellion so much against the 1940s and 50s. The children of the 1960s did not forsake their parents, rather they fulfilled them, fulfilled their expectations."

Dr. Turner closed with a quote from Margaret Mead, written in 1942. She says, "Were the world we dream of attained, members of that new world would be so different from ourselves that they would no longer value it in the same terms in which we now desire it ... We would no longer be at home in such a world ... We who have dreamed it could not live in it."

And he added: "We live in it and my role has been to recover the dream."

The next speaker, **Sylvia Lavin**, Professor of Architectural History and Theory at UCLA, argued that one of architecture's principal capacities was to simultaneously contain and expose fundamental shifts in cultural production. In particular, she addressed what she called the global "pavilionization" of architecture, the emergence of the pavilion as the primary form of architectural experimentation, the frame through which the discipline seeks to establish both its identity and its autonomy. Working through the rapid proliferation of this quasi-building type, she identified its splintering into two apparently opposed directions: the hyper-digital variety constructed using computer controlled fabrication technologies and invested in the logic of



ERICA ROBLES-ANDERSON

the computer rendering on the one hand, and the low-tech social-environmental variety, often made through deliberately amateurish assemblage strategies and of abject if not raw materials. Professor Lavin used this schizophrenia to suggest that the pavilion is now a dominant symbolic form through which architecture has acquired a new cultural function: to negotiate conflicting responses to the emerging digital episteme by subsuming computer based processes within a materially base and spectacularly immersive experience.

The last speaker, **Erica Robles-Anderson**, Assistant Professor of Media, Culture, and Communication, talked about frames in the context of computer screens and how these matter. One question she raised is why most humanists only use landscape screens, when much of their material has portrait mode orientation, while many programmers use portrait mode screens and multiple screens. She traced portrait mode orientation, with strong humanistic heritage, through looking at how the orientation of windows was discussed in 1920s in architecture and the long tradition of portrait mode paintings. She also discussed the framing done in different operating systems, and how the graphical information system that underlies most of our computer systems is one particular kind of frame.

Tackling Infrastructure, Space and Media

What sort of knowledge infrastructure do we need, and what case are we prepared to make for the Human Sciences and Arts? How is knowledge produced and circulated, and how are we and it shaped by the technology we are committed to using? Is the digital humanities a field, a process, or an approach? Or just a cover term for a combination of these things?

The symposium concluded in a discussion of some of these issues during the final session on the symposium's third day. An open discussion, convened by David Theo Goldberg, on future challenges and on the various subjects discussed during the symposium.

As an introduction, Dennis Tenen wondered if there is a space worth 85 preserving that stands in opposition to infrastructure. Nicole Starosielski argued that scholars and researchers in the humanities operate with different kinds of infrastructures and do not have a long tradition of applying for large grants to build physical spaces with a lot of equipment; even if some are moving in that direction.

“We have always valued other kinds of infrastructure, such as libraries for instance. Infrastructure is not simply technical artifacts, but also social processes bringing people together, as this conference demonstrates,” she said.

There is an inclination to value infrastructures and to preserve them, she continued, but then wondered what infrastructures we are living without.

“What does it mean to produce content in and for conditions of precariousness? When do we want to argue for a more reliable set of infrastructures for our practices instead of normalizing a sort of model of infrastructures that has been developed in other disciplines?”

The next question came from Arthur Bienenstock, a physical scientist very involved in infrastructures in his field.

“We used to ask a set of questions: What are the important things facing our field and how might infrastructure advance our knowl-



edge? Alternatively, what are the new opportunities for infrastructures and will they advance our knowledge in any way? Why haven't these questions been raised during this conference?"

One of the participants argued that new knowledge is often articulated in terms of abstraction, equal to measures and tools.

"Maybe we can't find new knowledge without these new tools, and maybe we create new knowledge with these new tools; visualization, data analysis tools, etc. It's an inevitable development that goes hand in hand. I see the infrastructure as a collection of tools."

Professor Goldberg agreed, maintaining that on the one hand there is a fascination and experimentation with the new tools, and

on the other hand we are asking: “What are the tools we need to respond to the humanities?” It is not a case of either/or, but is deeply interwoven, he argued.

Terms discussed during the final session included indigeneity and transnationalism, which, as pointed out, were not brought up during the previous sessions. Jim Barrett talked about a project involving Samis (northern Scandinavia’s indigenous population) within the framework of HUMlab 2004, involving a blog started by a research team. The community, a Sami settlement in Jokkmokk, is situated 60 km above the Arctic Circle and the project began in temperatures of -35°C (-31°F). A mobile wireless network was set up with the idea of blogging constantly for three days. But at the end of the project the Internet collapsed, as the single cable linking the community to the outside network was overwhelmed.

“I think the project touches upon a lot of what has been discussed the two past days, it was very precarious and continued for a short time,” Dr. Barrett said. “We were trying to provide a voice from the Sami country with a global reach and had a tremendous number of hits on the blog, 30,000 a day. We saw the infrastructure emerge, fade and ultimately die when the Internet collapsed and we couldn’t stream the final concept. It was as if we created a crystal structure of Jokkmokk for a short time, then it disappeared.”

Professor Goldberg then posed a question about the consequences of the humanities’ adoption of the laboratory as a pedagogical space. “It’s a structure, it leads to the posing of questions in a certain way and it creates its object of analysis. What are the affordances, what gets enabled, or disabled, through a kind of laboratory structure?” he asked.

Sven Strömqvist argued for the laboratory model, referring to the Lund Humanities Lab. The premises are not specifically created for humanities students, he underlined, the lab is rather a meeting place, an interface between students and researchers in the humanities, and those from other fields such as medicine or engineering.

“If you empower a new generation of students in the humanities with tools that supplement the methods we are traditionally taught to use in our field, they might stand a chance of collaborating with those on the other side of the fence and addressing complex research questions concerning human beings and the human condition,” he said.



Professor Strömqvist added that he was somewhat suspicious of using the term digital humanities. He felt there is a danger in humanities scholars locking themselves into a room rather than opening doors.

“In my way of thinking, digital humanities is not a new discipline, it’s a movement to empower humanists with tools, going one step further on a new empirical path,” he went on. “In order to use the tools properly we need to collaborate with scholars and researchers who can help us use experimental and quantitative methods, at least as far as using the lab for investigative purposes.”

Sheila Kennedy, on the other hand, argued against the lab model and the importance of results and metrics. She pointed out several limiting aspects with a laboratory.

“It’s hard to think about criticality having metrics, it shouldn’t be quantified,” she said. “Instead we should be posing questions, thinking about dismantling assumptions. This is not place specific, that’s the nature of infrastructure. That you can have significant thoughts, no matter where you are.”

Patrik Svensson concluded the discussion by reflecting on space and HUMlab in particular, which he described as a conflation of several types of infrastructure; lab, studios and seminar rooms.

“Bringing people together is important to me. We see the laboratory as a push back on the institutional structures of the university, a possibility to have a dialogue across disciplinary compartments.”

There are very few places like this in Sweden, and the demand for these kinds of meeting places is high, Professor Svensson argued. This, he said, has given HUMlab an interesting vantage point from which to challenge and to apply pressure.

“I see running HUMlab as a balancing act. We are pushing, tweaking, it’s a constant struggle,” he said. “When the new lab was conceptualized no one thought of our job as connecting the two campuses. But we can push against the idea of separating the art from the rest of the university, so facilitating flows of people between the campuses as well to the outside is very important.”

In his closing address **Craig Heller** revealed that he had come to the symposium greatly suspicious of the words digital humanities as a term or field, and that the symposium had done nothing to convince him otherwise.





“I really don’t like it,” he said, adding that “in spite of all of the great presentations in the symposium, I still do not think that the term digital humanities describes a unique field of scholarship. I’m fine with the word humanities and with the study of human conditions and human nature. I am also fine with the word digital as it embodies fantastic technologies and great tools. They are just tools, however, the use of those tools raises concerns that depend on the specific uses. These concerns have to be kept in mind when considering work in what is referred to as the digital humanities.”

One concern is the distinction between process and product. Humans like to think that we have done something solid that will last, such as a book or a painting.

“But we have to remind ourselves that everything we do in the digital world has a tremendous transience. We can still read clay tablets from thousands of years ago, but I can’t read my floppy disks from 15 years ago. We have to think about many digital technologies as being process and not product. They are evolving and transient.”

The other concern he posed is distinguishing whether the digital tools are being used in a creative mode or in an investigative mode. If you are in a creative mode, the end justifies the means, but if you are in an investigative mode, the ends never justify the means, the means have to be honest, true, and proven valid or useful.

“We have to ask ourselves whether we are engaged in creative or investigatory activities, as both are important aspects of the humanities, albeit very different endeavors.”

Professor Strömqvist stressed the immense importance of addressing the digital world as an object of study, trying to understand it in a more philosophical sense in the context of traditional humanities.

“There are, at least in my perception, two main roads where the humanities have to catch up,” he said. “One has to do with allowing the Internet and the digital world as a legitimate object of study. But it is also important to explore how we can use digital methods as tools for enhancing our understanding of the human beings and human condition, two topics that have been profoundly reflected during these three days.”

Professor Svensson, who served as the host for the symposium *Media Places*, rounded off by saying that he himself is fairly flexible about terms.

“The digital humanities is what we make it into, and this symposium has been a model or a possibility for what the field can be – and I think that worked out very well, whether we call it digital humanities or not. It has been an honor,” he concluded, “to have some of the world’s leading researchers in this area here. These have been marvelous days with many far-reaching discussions and questions, and productive tensions as well. This is going to continue.”



Closing Words

In the spring of 1996, a group of Swedish industrialists decided to form a foundation in order to honor Peter Wallenberg on the occasion of his 70th birthday. 93

In a letter to a number of Swedish and Finnish companies proposing the Foundation, Peter Wallenberg was not only referred to as the doyen of Swedish industry, but also as being one of the strongest influences for the development of an advanced society of knowledge. During the past five years, the Foundation has granted the total of SEK 19 million for various high-level symposia and projects. Since the establishment of the Foundation almost SEK 42 million has been granted.

Digital media and methods, including teaching and learning methods, is a rapidly growing area of interest in the humanities. It deals with the intersection of computing and the disciplines of the humanities, and it incorporates both digitized and born-digital materials





and combines the methodologies from the traditional humanities disciplines.

Researchers at Lund, Umeå and Stanford Universities, many of which are engaged in projects supported by other Wallenberg Foundations, approached the Foundation with a proposal for a series of three symposia within the area of digital media and methods in the humanities. The first symposium, called *Media Places 2012*, was realized in Umeå and brought together some of the best researchers and practitioners at the intersection of media, place and technology, as well as in the humanities, and is presented in this book. The other two will be held in Helsinki, Finland, 2013 and in Lund, Sweden, 2014, addressing the themes of digital media and learning, and culture and brain.

The Board is grateful to the organization committee, Craig Heller, Sven Strömqvist and Patrik Svensson, as well as journalist Agneta Larsson, who has written this summary of the discussions, which were held over three days, the graphic designer Sture Balgård, the photographer Magnus Bergström, and the editor Pehr Hedenqvist.

Hans Wibom

Executive Member of
the Board of the Foundation



The Speakers

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Johanna Drucker, UC LOS ANGELES, is the Bernard and Martin Breslauer Professor of Bibliography at the UCLA Graduate School of Education and Information Studies. She is also internationally known as a book artist and experimental, visual poet. In addition to her extensive scholarly work, Professor Drucker has produced more than two-dozen artists' books, many produced using letterpress and experimental typography.

Ava Fatah gen. Schieck, UNIVERSITY COLLEGE LONDON, is Architect, Educator and Researcher. She is Lecturer in Digital Interaction on the MSc Adaptive Architecture and Computation program at the Bartlett, UCL.

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David Theo Goldberg, UNIVERSITY OF CALIFORNIA HUMANITIES RESEARCH INSTITUTE, is the Director of the Institute and Executive Director of the Digital Media and Learning Research Hub. Formerly Director and Professor of the School of Justice Studies, a law and social science program, at Arizona State University, he is Professor of Comparative Literature, Anthropology, and Criminology, Law and Society at the University of California, Irvine.

Jo Guldi, HARVARD UNIVERSITY, is Historian of modern Britain and Junior Fellow at the Harvard Society of Fellows. She received her AB from Harvard University, and then studied at Trinity College Cambridge before completing her Ph.D. in History at the University of California, Berkeley.

N. Katherine Hayles, DUKE UNIVERSITY, is Professor of Literature. Her research interests include Digital Humanities, Electronic Literature, Literature, Science and Technology, Science Fiction, and Critical Theory.

H. Craig Heller, STANFORD UNIVERSITY, is Professor of Biology. His current research interests are neurobiology of sleep, circadian rhythms, regulation of body temperature, mammalian hibernation, and human exercise physiology.

Garnet Hertz, UNIVERSITY OF CALIFORNIA, IRVINE, is a Fulbright Scholar and Contemporary Artist whose work explores themes of technological progress, creativity, innovation and interdisciplinarity. He is Artist in Residence and Research Scientist in Informatics at UC Irvine and Adjunct Assistant Professor in the Media Design Program at Art Center College of Design.

Finn Arne Jørgensen, UMEÅ UNIVERSITY, is Associate Senior Lecturer. He has a Ph.D. in Science and Technology Studies from Department of Interdisciplinary Studies of Culture, Norwegian University of Science and Technology, Trondheim, 2007. His book *Making a Green Machine: The Infrastructure of Beverage Container Recycling* examines the development of sociotechnical systems for managing empty beverage containers in Norway, Sweden, and the US, 1970–2000, particularly examining the history of the reverse vending machine.

Sheila Kennedy, MIT SCHOOL OF ARCHITECTURE, received her Bachelor's Degree in history, philosophy and literature from the College of Letters at Wesleyan University. She studied architecture at the École Nationale Supérieure des Beaux-Arts in Paris and received the Masters of Architecture from the Graduate School of Design at Harvard University where she won the SOM National Traveling Fellowship and was graduated with Distinction, the School's highest academic honor. In 1990, she founded Kennedy & Violich Architecture (KVA MATx) in partnership with Juan Frano Violich. As Associate Professor at Harvard's GSD, she was Director of the M Arch II Program 1991–1995 and is Professor of the Practice of Architecture at MIT.

Kim A. Knight, THE UNIVERSITY OF TEXAS AT DALLAS, is currently Assistant Professor of Emerging Media and Communication. Her research interests include media and cultural theory, digital and information culture, new media literature and art, popular culture, and social media. In the spring 2013 semester, she will be returning to teaching Digital Textuality at both the undergrad and graduate levels. In addition, she is supervising ten capstones and working with multiple students on the continuation of the Fashioning Circuits project. Her major research project continues to be work on a book manuscript entitled *Media Epidemics: Viral Structures in Literature and New Media*. She also continues work on her blog on gender and media, *The Spiral Dance*.

Sylvia Lavin, UC LOS ANGELES, is the Director of the Ph.D. and Professor of Architectural History and Theory in the department of Architecture and Urban Design, where she was Chairperson from 1996 to 2006. She is also Visiting Professor at Princeton University's School of Architecture. As a leading figure in current debates, she is known both for her scholarship and for her criticism in contemporary architecture and design. Recent and forthcoming books and catalogues include *Kissing Architecture*, *The Flash in The Pan and Other Forms of Architectural Contemporaneity*, and *Everything Loose Will Land: Art and Architecture in Los Angeles in the 1970s*.

Cecilia Lindhé, HUMLAB AT UMEÅ UNIVERSITY, is Associate Professor. She holds a Ph.D. in Comparative Literature from Uppsala University. Her current research spans ancient/medieval rhetorical and aesthetic theory in relation to digital materiality, digital representation of cultural heritage, screen culture and digital literature and art. At present she is involved in three research projects: *Imitatio Mariae. Virgin Mary as a Virtuous Model in Medieval Sweden*; *Multiple Screens as Material*; *Representations and Reconfigurations of the Digital Swedish Literature and Art 1950–2010*.

Shannon Mattern, THE NEW SCHOOL, NEW YORK, is Associate Professor in the School of Media Studies. She has a Ph.D. in Culture and Communication from New York University. Her teaching and research address relationships between the forms and materialities of media, and the spaces they create and inhabit. She has written about libraries and archives, media companies' headquarters, place branding, public design projects, urban media art, media acoustics, media infrastructures, and material texts. She is the author of *The New Downtown Library: Designing With Communities*. Her work has appeared in *Public Culture*; *Space and Culture*; *The Senses & Society*; *Music, Sound and the Moving Image*; the *International Journal of Communication*; *Invisible Culture*; the *Journal of Architectural Education*; and in several edited volumes. She edited a special issue of MediaCommons' *The New Everyday* on "notes, lists, and everyday inscriptions," and she is now the journal's editor.

Tara McPherson, UNIVERSITY OF SOUTHERN CALIFORNIA, is Associate Professor of Gender Studies and Critical Studies at USC's School of Cinematic Arts. Her book, *Reconstructing Dixie: Race, Gender and Nostalgia in the Imagined South* received the 2004 John G. Cawelti Award for the outstanding book published on American Culture. She is co-editor of the online journal, *Vectors: Journal of Culture and Technology in a Dynamic Vernacular*, as well as co-editor of the anthology *Hop on Pop: The Politics and Pleasures of Popular Culture*. Her research interests include issues of convergence, gender, race, representation, multimedia literacy and authorship.

Christer Nordlund, UMEÅ UNIVERSITY, is Historian of Science and Ideas focusing on the cultural, material and intellectual history of science, technology and the environment from 1800 onward, mainly in a Scandinavian context.

Thomas Nygren, HUMLAB AT UMEÅ UNIVERSITY, is Doctor of History and Education, Researcher and National Project Coordinator of European History Crossroads as Pathways to Intercultural and Media Education (EHISTO) as well as Teacher. In his thesis, he presented the richness of practices where teachers and students understand and communicate history in various ways. In the research project "History Beyond Borders: The International Textbook Revision 1919–2002," he studied the relationship between international guidelines and Swedish history education, understanding better the complexity of implementation.

Jennie Olofsson, HUMLAB AT UMEÅ UNIVERSITY, works as Associate Senior Lecturer. She is part of the research project "Media Places." Her current research interest concerns the stewardship of discarded screens and how the simultaneous miniaturization and increase of the amount of screens in everyday life affect processes of recycling and reuse. Previously, she worked as Researcher at the Department of Business Administration, Technology and Social Sciences at Luleå University of Technology. As a part of this position, she was also responsible for the course Gender, Technology and Aesthetics.

Natalie M. Phillips, MICHIGAN STATE UNIVERSITY, is Assistant Professor of English and specializes in 18th-century literature, the history of mind, and cognitive approaches to narrative. She is also a leading figure in the emerging field of literary neuroscience, pioneering a series of interdisciplinary experiments that use neuroscientific tools, such as fMRI and eye track-

ing, to explore the cognitive dynamics of literary reading. She is co-founder of the Digital Humanities and Literary Cognition Lab in the Department of English at MSU, and Lead Faculty for Literary Neuroscience and History of Mind. In addition, she is collaborating scientist with Stanford University, Lund University, and Umeå University for a research initiative, “Culture, Brain, and Learning,” supported by the Wallenberg Foundation. Current experiments include an fMRI of literary attention (Neuroventures), an eye-tracking study of digital media (Wallenberg Foundation), and a project-in-progress on narrative empathy and stories of trauma.

Erica Robles-Anderson, NEW YORK UNIVERSITY, is Assistant Professor of Media, Culture, and Communication. She focuses on the role media technologies play in the production of space. In particular, she concentrates on configurations that enable a sense of public, collective, or shared experience, especially through the structuring of visibility and gaze. Trained as both an experimental psychologist and a cultural historian she has employed a range of methodologies to explore the definition of media-space. She is currently writing a book about the 20th century transformation of Protestant worship space into a highly mediated, spectacular “mega-church.” She is currently a recipient of the Intel Science and Technology Center grant for Social Computing.

Chris Speed, EDINBURGH COLLEGE OF ART, is Professor in Design Informatics. He has sustained a critical enquiry into how network technology can engage with the fields of architecture, design and human geography through a variety of international digital art exhibitions, funded research projects, books, journals and conferences. Currently he is working on funded projects that engage with the flow of food across cities, an internet of cars, turning printers into clocks and a persistent argument that chickens are actually robots. He is co-organizer and compere for the Edinburgh www.ThisHappened.org events and is co-editor of the journal *Ubiquity*.

Nicole Starosielski, NEW YORK UNIVERSITY, is Assistant Professor of Media, Culture, and Communication. Her research focuses on the global distribution of digital media, and the relationship between technology, society, and the aquatic environment. She is under contract with Duke University Press for a book that will examine the cultural and environmental dimensions of transoceanic cable systems, beginning with the telegraph cables that formed the first global communications network and extending to the fiber-optic infrastructure that carries almost international Internet traffic.

Molly Wright Steenson, PRINCETON UNIVERSITY, is Design Researcher and Architectural Historian. She completes her Ph.D. from Princeton University's School of Architecture in spring 2013, with her dissertation, "Architectures of Information: Christopher Alexander, Cedric Price, Nicholas Negroponte and MIT's Architecture Machine Group." As a Design Researcher, she examines the effect of personal and mobile technology on people's lives, with recent projects in the US, India and China for major corporations and consulting firms. She was a resident professor at the Interaction Design Institute Ivrea in Italy and holds a M.A. in Architecture from Princeton, a Master's in Environmental Design from the Yale School of Architecture and a B.A. in German from the University of Wisconsin-Madison. As of 2013, she is Assistant Professor in the School of Journalism and Mass Communication at the University of Wisconsin-Madison.

Sven Strömqvist, LUND UNIVERSITY, is Assistant Vice-Chancellor and has a special responsibility for research and infrastructure. He is Professor of General Linguistics and Language Acquisition. He holds a position as Affiliate Professor at the University of Stavanger. Professor Strömqvist is also the Chair of the Wallenberg Network Initiative – a scientific cooperation program between Stanford University, Lund University and Umeå University – where among other things – the network studies the effects of narrative information on cognitive processes such as memory and learning.

Patrik Svensson, HUMLAB AT UMEÅ UNIVERSITY, is Professor in the Humanities and Information Technology, and Director of HUMlab. As the Director of HUMlab, he is deeply engaged in facilitating cross-sectional meetings and innovation, in the future of the humanities and the university, in reaching out to others, and in the intersection of the humanities, culture and information technology. His research interests span information technology and learning, research infrastructure, screen cultures, and the digital humanities as an emerging field.

Fred Turner, STANFORD UNIVERSITY, is Associate Professor in the Department of Communication and Director of Stanford's Program in Science, Technology, and Society. He has written three books, *From Counterculture to Cyberculture: Stewart Brand, the Whole Earth Network, and the Rise of Digital Utopianism*, and *Echoes of Combat: The Vietnam War in American Memory*, and *The Democratic Surround: Multimedia and American Liberalism from World War II to the Psychedelic Sixties* (will be published by The University of Chicago Press in November, 2013). His research and teaching focus are on digital media, journalism and the roles played by media in American cultural history.

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