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Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the collaborating institutions or the National Endowment for the Humanities.
# The Institute for Computing in Humanities, Arts, and Social Science: A Challenge Grant Endowment

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ABSTRACT

The Institute for Computing in Humanities, Arts, and Social Science (I-CHASS) charts new ground at the intersection of digital scholarship and the humanities. I-CHASS fosters path-breaking research and develops computational resources, collaborative tools, and educational programming to advance humanities scholarship. With strong backing from the University of Illinois at Urbana-Champaign, I-CHASS seeks a Challenge Grant of $750,000. The grant plus $2.25 million in matching funds will create a $3 million endowment which, along with other support from the University, will fund three positions at I-CHASS: an Associate Director for Data Analytics and Pattern Recognition, an Associate Director for Human-Computer Interaction, and an Assistant Director in Modeling. These key staff members will advance the digital humanities in several ways:

- They will collaborate with humanities scholars on specific projects.
- They will serve as “expert brokers” and facilitators, connecting humanists with world-class computing experts and facilities to create new models of humanities research and learning.
- They will help to create an ongoing cyberinfrastructure for the digital humanities—a set of advanced tools that will enable scholars everywhere to undertake ambitious new forms of research and education, including the lecture hall and classroom.
- They will create and participate in a vibrant national digital humanities community that includes faculty, graduate and undergraduate students, and members of the public. Additionally, the Grant will support training and education initiatives using a depleting fund model of about $50,000 per year for fifteen years. These spend-down funds will finance workshops and mini-residencies designed to offer humanists the computational expertise necessary to exploit advanced computing software and hardware to support their research. Educational programming is also necessary to produce the next generation of scholars and digital scholarship.

Formed in 2004 and now expanding rapidly to meet the growing need, I-CHASS was intended from the start to be a nationwide resource. It is the only digital humanities center co-located and partnered with a supercomputing center—the National Center for Supercomputing Applications (NCSA). Illinois is already host to a broad array of digital humanities research, much of it with national reach. The newly created Illinois Informatics Institute is charged with creating “information environments of the future” and educating “those who would build and use them.” Furthermore, the University of Illinois is the home of the nation’s third-largest university library as well as the number-one-ranked Graduate School of Library and Information Science. The University’s administration, including the President, Chancellor, and Provost, are fully committed to the mission of I-CHASS and its national agenda. They have committed, along with the Illinois Alumni Association and the University of Illinois Foundation, to being fully engaged in raising the required matching funds of this Challenge Grant application.

I-CHASS believes that computing is revolutionizing humanities research. Advanced data acquisition, data storage and management, user-friendly data mining and visualization technologies, large-scale modeling and simulation, massive text and visual searches with complex relational analysis—these techniques, not possible a few years ago, are now galvanizing the humanities. The next step in the digital humanities revolution, with the power to broaden humanities scholarship, is high performance computing (HPC). Just as traditional computing applications have expanded the type of questions asked by humanists, access to the computational power afforded by the advent of HPC increases possibilities for researchers and educators in the humanities. The 2007 announcement of NSF funding for NCSA to build a petascale facility (dubbed “Blue Waters”) at the University of Illinois positions I-CHASS to engage in digital humanities research and education at the highest end of computing. Humanists working with ICHASS will have access to the Blue Waters supercomputing capacity and the expertise of 250+ researchers and scientists engaged in computing at NCSA that is not readily available to researchers elsewhere.

Funding will enable our continued and long-term effectiveness in a wide range of digital humanities work already under way. The NEH Challenge Grant would thus, through I-CHASS, have a broad and lasting influence across the United States.
INTRODUCTION

The Institute for Computing in Humanities, Arts, and Social Science (I-CHASS) charts new ground at the intersection of digital scholarship and the humanities. Believing that humanities disciplines are essential to modern life and that advanced computing can improve humanities research and teaching by democratizing access to knowledge and learning, I-CHASS generates a complete scholarly and pedagogical arsenal to positively affect the human condition and experience by serving as an “expert broker.” We connect humanists with specialists in information technologies to broaden the effectiveness of humanities research and teaching. In some cases, computer scientists can adapt existing digital tools and repositories for the humanities project at hand; in other cases new tools and conceptual frameworks must be developed; many projects require a mix of both. Regardless, humanities researchers must be involved intellectually in the idea and design phase of tool-building so that the end product fits the particular needs of humanists and is not limited by the very different demands of science and engineering. I-CHASS provides this important liaison between computing specialists and humanists.

The Challenge Grant funds will serve two functions. $2.2 million will create an endowment that will provide annual support of $X for three important staff positions—an Associate Director for Data Analytics and Pattern Recognition, an Associate Director for Human-Computer Interaction, and an Assistant Director in Modeling—the NEH Challenge Grant will enable us to further develop our most important resource: human infrastructure. I-CHASS staff are constant, active, and passionate advocates of digital technologies for the humanities and continually develop new ways of bringing computing resources to these communities. Serving the computing needs of humanists working in the field is the essential first step. With the benefit of workshops funded by the Challenge Grant in the form of an $800,000 depleting fund, I-CHASS will broaden its creation of a collaborative environment in which humanities scholars and technology specialists join forces to produce the next generation of scholarship. We aim for an innovative system capable of establishing a paradigm of humanities research that

Appendix A: URLs and Glossary includes URLs for I-CHASS and other programs and projects, and a glossary of terms.
accelerates scholarly and technological development. We do not want to do the same things—while successful—again and again, but instead desire effective innovations that are applicable over a wide array of humanities disciplines. Image processing, virtual worlds, social networks, semantic representations, and other emerging technologies are ripe to be leveraged for humanities scholarship and research, in much the same way as MOSAIC—the world’s first graphic web browser, which was developed at the National Center for Supercomputing Applications—did for information exchange. For this, having a dedicated and supported human infrastructure is essential. With the benefits of this grant, I-CHASS will be a leader in these endeavors.

The University of Illinois at Urbana-Champaign has long been at the forefront of science and technology. NCSA, one of five original supercomputing centers in the United States, opened its doors in January 1986 and since has led hardware and software innovation. Today the center is recognized as an international leader in deploying robust high performance computing resources and is a powerful champion of computing in the humanities. I-CHASS, founded in 2004, cements and expands NCSA’s 1993 Initiative for Humanities and Social Sciences and its hiring of humanities scholars as Senior Research Scientists. A more recent addition to the University of Illinois campus, the Illinois Informatics Institute (I^3) further underscores Illinois’ commitment to high performance computing in the humanities. As part of the university’s strategic plan emphasizing informatics, I^3 is charged with creating “information environments of the future” and educating “those who would build and use them.” I-CHASS is now affiliated with I^3, just as it is with NCSA.

SIGNIFICANCE AND INTELLECTUAL QUALITY OF HUMANITIES ACTIVITIES Computing is revolutionizing humanities research. Advanced data acquisition, data storage and management, user-friendly data mining and visualization technologies, large-scale modeling and simulation, massive text and visual searches with complex relational analysis—these techniques, not possible a few years ago, are now galvanizing the humanities. But as humanities researchers harness these new capabilities, they must overcome major hurdles. Although new computational technologies

^1 http://www.strategicplan.uiuc.edu/
give them access to a number of informational sources and allow them to automatically generate datasets from those sources, researchers often struggle with the plethora of available information.

Fortunately, the technologies that created the problem of having too much data can also help researchers gain insight and understanding from data resources. I-CHASS is the collaborative institution to introduce these technologies to humanities users at all levels of computing expertise. We provide resources, both human and computational, to enhance discovery and exploration. We offer humanists access to hardware, computer applications, graphical user interfaces and portals, and educational opportunities to train them to best use these resources. For the most developed projects, we can help them create their own “cyberenvironments,” an integration of distributed computing and data resources into end-to-end processes. (See Appendix B: Prototype Cyberenvironment.) From innovation to the resulting product, I-CHASS is a full-service humanities computing resource that guides humanities scholars to problem-solving solutions while simultaneously facilitating an easy adoption of technologies.

The next step in the digital humanities revolution, with the power to broaden humanities scholarship and as recently endorsed by the NEH, is high performance computing (HPC). Just as traditional computing applications have expanded the type of questions asked by humanists, access to the computational power afforded by the advent of HPC increases possibilities to researchers and educators in the humanities. The 2007 announcement of NSF funding for NCSA to build a petascale facility (dubbed “Blue Waters”) at the University of Illinois positions I-CHASS to engage in digital humanities research and education at the highest end of computing. Humanists working with I-CHASS will have access to the Blue Waters supercomputing capacity and expertise that is not readily available to researchers elsewhere.

Following the 2007 Association for Computers and the Humanities annual conference, hosted and co-sponsored by the Graduate School for Library and Information Science (GSLIS), NCSA, and I-CHASS, Willard McCarty—one of the earliest scholars to recognize and apply computing to the humanities—spoke of how the humanities can benefit from HPC in his work on Ovid’s Metamorphoses: “What I’m thinking is that the influence of the Metamorphoses might be modeled as never before by

describing specific patterns in its many stories and configurations of these stories, then turning this
description loose on as much of literature as could be assembled. … What would begin to make this project
supercomputerish would be the condition that for every connection discovered with a subsequent text by an
exact or even partial match with one or more pattern or configuration, the permutations thus introduced
would in turn define a new range of possible connections. … And so the possibilities quickly multiply
exponentially—and behold, a supercomputer problem.”¹ I-CHASS is in the early stages of a project in this
spirit, *Linguistic Prescriptivism*, which charts linguistic development across national and cultural boundaries.

This Challenge Grant will allow us to expand the project beyond the planning stages to a petascale level
prototype.

The NEH has recognized the challenge associated with high performance computing for the humanities and the
work of I-CHASS in meeting those needs. The NEH asked leading scholars, computer scientists, and
government agencies, including the Director and the Executive Director of ICHASS, to spend a day in
Washington, D.C., in July of 2007 to discuss the potential of humanities high performance computing. The
“Humanities High Performance Computing” Workshop documented that when offered a possibility for
advanced analysis with HPC, many humanists are amazed and enthusiastic about where their research might
lead. In its workshop report, the NEH noted that “we need examples of successful collaborations—to show
both the humanists and the computer scientists what’s possible, how their work and interests could benefit from
collaboration, etc. And examples of failures will be useful too—others will benefit from knowing what didn’t
work.”² As the NEH suggests, the advantages of the national cyberinfrastructure will not be fully realized until
humanists are empowered to tap its capabilities and document their work. Properly resourced through the
benefits provided by this grant, I-CHASS can meet the NEH’s call, but that response is predicated upon
extending its current infrastructure.

Training more humanities scholars to be experts in the specific challenges of high performance computing is
critical to the growth of digital humanities scholarship. Many humanists—just like their

¹Email from McCarty to Vernon Burton, June 10, 2007 and subsequent discussions. See also Willard McCarty, lecture, 9 April 2008,
*Can we build it? Lessons and speculations on literary computing.*² See Appendix F: List of I-CHASS Projects for more details
colleagues in the sciences some twenty years ago—do not have the computational expertise necessary to move their research to the next level. The vast majority of humanities scholars are still daunted by the humanities-computational sciences divide. I-CHASS thus offers training in these essential skills through workshops and mini-residencies. I-CHASS is committed to working with a variety of scholars and educators on a wide range of projects. At the most elementary level, we offer simple encouragement and guidance. We show humanities researchers and students with little knowledge of advanced computing how to use new technologies in their work. At a more sophisticated level, I-CHASS brings together and supports scholars who are already familiar with digital humanities. For them, we create new, and adapt existing, applications to make them more accessible to broader communities.

Because scholars in the humanities disciplines must be involved in the development of computing solutions for their community, I-CHASS forges teams of humanists and scientists for mutually beneficial exchanges of expertise. With the long-term stability associated with this grant, I-CHASS can substantially expand the number of researchers, educators, and specialists influenced by these collaborations. I-CHASS has proven that these different spheres are compatible because it has begun to play a critical role in helping humanities scholars embrace new technologies and work in collaboration with computer scientists. Humanities researchers can come with their computational and storage challenges, receive advice and help, and indirectly have access to the most appropriate HPC resources.

CHALLENGE GRANT FUNDS The opportunities provided by the NEH Challenge Grant funds are central to expanding I-CHASS collaborations. A $750,000 Challenge Grant will leverage matching funds of $2.25 million to create a total endowment of $3 million. Challenge Grant funding will serve two purposes at I-CHASS. We will invest $2.2 million of the total funds to seed an endowment for I-CHASS personnel, investing in human capital. Endowment income of approximately $X per year will provide long-term support for three pivotal staff positions, currently on loan from NCSA or supported by existing grants. These positions have been temporarily assigned to I-CHASS in anticipation of this proposal being successful and have already made significant strides in digital humanities education, outreach, and development. Their continued assignment to I-CHASS, however, is contingent upon receiving this Challenge Grant funding.
The remaining $800,000 will support training and education initiatives using a depleting fund model of $53,333 per year for fifteen years to finance an expanding array of workshops and mini-residencies. These aspects of I-CHASS—personnel and training—are essential, and the need is immediate. Yet the next generation of scholars and researchers will face an entirely different set of challenges and I-CHASS seeks to position itself to be able to respond to these evolving needs. **Personnel:** The endowment model for personnel is important for humanities computing as interdisciplinary research needs to target not just established faculty, but also those just beginning their careers, whether junior faculty members or graduate students. Although digital humanities scholars now experience some difficulties associated with legitimating digital projects as scholarly achievement, the next generation of humanities scholars will be intimately familiar with digital technologies and will not face these same hurdles. Significantly, we intend to focus on these up-and-comers. The endowment model supports core personnel with significant experience who understand humanities disciplines and computing technologies and can build these relationships. We find the endowment model allows us to do this for the long-term.

The staff positions supported by this proposal are more than the builders and developers of new digital tools for the humanities. They co-lead teams of humanists and computer scientists to explore challenging research questions. Collectively they serve as a bridge for experts in different fields, facilitating communication and suggesting pathways for scholarly achievement. Teams of humanities experts and IT experts, our “human infrastructure,” will enable a major leap in scientific research and discovery for humanities research.

Through the Challenge Grant Endowment, an Associate Director for Data Analytics and Pattern Recognition will be supported at $X, an Associate Director for Human-Computer-Interaction will be supported at $X, and an Assistant Director in Modeling will be supported at $X. The Challenge Grant will fund these positions as half-time appointments. However, generous support from NCSA and I-CHASS, as outlined in our letters of support, will make these positions full-time appointments. The Provost’s Office has committed to supply fringe benefits for these positions and bridge funding to allow the benefits of the Challenge Grant to commence immediately.
This will complement existing Provost Office support for I-CHASS, which provides $X to cover a full-time salary for Executive Director Dr. Kevin Franklin, $X to fund a project manager, and $X to seed projects until they can attract external funding. In addition, if our Challenge Grant application is successful, the Provost’s Office has committed to providing funds of up to $X in the initial year of the Challenge Grant funding period. The Challenge Grant will thus sustain an on-going personnel framework that has already proven successful.

**Training:** The Challenge Grant’s funding of workshops will sustain an existing framework. I-CHASS recognized early that it is not enough simply to develop tools; we must also consistently train humanists in computing capabilities and disseminate the knowledge and potential of humanities initiatives. We do this informally every day by opening dialogues with humanities scholars. We also conduct two formal types of training opportunities: five-day mini-residencies that are available to individuals engaged in humanities scholarship and research, and two-day workshops that invite specific humanities groups who are already knowledgeable about digital projects and interested to learn more advanced computer techniques. We are in the process of instituting an online proposal application process whereby potential participants will be able to apply for specific workshops, mini-residencies, and computer resources. Currently, we rely on outreach led by I-CHASS staff and our international network of experts in both the humanities and high performance computing. Because workshops and mini-residencies on digital humanities offer a way to democratize knowledge, I-CHASS makes a concerted effort to reach out to scholars from under-resourced schools and minority serving institutions. We have already established a partnership with the Minority Serving Institutions Network. Workshops and mini-residencies are driven by the particular needs of humanities disciplines—not by technological concerns—and I-CHASS organizes outreach workshops to determine those needs. In the immediate future we will establish a series of training sessions designed to inspire new thinking about how humanities projects can best make use of the specific capabilities of high performance computing.

Each year I-CHASS sponsors one mini-residency attended by between 45 and 60 participants over five days. The format includes a core set of presentations on computational technologies and hands-on participation in break-out sessions. These mini-residencies foster outreach, education, and training,
and ensure that digital tools are put into the hands of humanists.

We plan an additional three intensive workshops per year. Attendance in these immersion-rich experiences usually consists of a group of approximately five humanists and three computer scientists. These workshops result in the development of specific technical and human infrastructures to support humanities research in a particular subfield (such as Simulation and Modeling, Social Networking, Grid and Distributed Computing, Data Analytics, and Visualization). By the close of the workshop, each group of humanists has a clearly delineated pathway for employing specific technologies in their research projects and will have begun to adapt those technologies to their particular needs. Challenge Grant funding will allow us to expand the number and type of workshops that we offer and increase participation by broadening our outreach to include junior faculty and graduate students, who are an untapped resource.

A recent workshop, co-hosted with the Software Environment for the Advancement of Scholarly Research (SEASR) group at NCSA, provides an illustration of the interaction we envision. A group of scholars, led by Virginia Kuhn of the University of Southern California’s Institute for Multimedia Literacy, are working to create an archival system in support of a digital portfolio application. They approached I-CHASS and SEASR about a specific challenge they faced in their research: the lack of affordable computational resources capable of holding large collections of multimedia resources, most notably in the form of portfolios created through media-rich student projects and faculty teaching resources. The resulting project, *Humanistic Algorithms*, is being imagined in phases, with the first stage to serve as a prototype to be completed by early June 2008. I-CHASS and SEASR will use data analytics to extract information from unstructured texts to produce semantic information that can be used to create meta-analyses of scholarly multimedia. *Humanistic Algorithms* will consider: What are the components of scholarly multimedia? What is pedagogy in a networked world? How do we collaborate, train faculty, and teach students how to read and compose scholarly multimedia? The funds associated with the Challenge Grant will allow *Humanistic Algorithms* the opportunity to further their technological efforts by isolating and adapting additional high performance computing technologies that will aid in the development of the digital portfolio application.
I-CHASS workshops are often collaborative. We have established relationships with the San Diego Supercomputing Center (SDSC), the Pittsburg Supercomputer Center, The Texas Advanced Computing Collaboratory, TeraGrid, the Great Lakes Consortium for Petascale Computing, and NCSA. Examples of the effectiveness of these collaborations include an Engaging People in Cyberinfrastructure/ NSF-funded workshop on Cyberinfrastructure in the Humanities, Arts and Social Sciences and a workshop on Computational Methods in Humanities, Arts and Social Sciences. Recently, I-CHASS received a grant from the Supercomputing 08 Education Program to develop a summer 2008 workshop centered on High Performance Computing in Humanities, Arts and Social Science, to be hosted by I-CHASS and NCSA. All workshops and mini-residencies provide broad-based work on digital tools for the humanities. See Appendix C: Workshops and Conferences for a list of workshops and conferences that have been supported by I-CHASS.

**SAMPLE PROJECTS SUPPORTED BY I-CHASS** Meeting the discipline-specific needs of the humanities community is the focus of all I-CHASS activities, and the Challenge Grant will ensure that this work continues. Projects currently underway at I-CHASS generally fall into one of two categories: either content-based digital scholarship and research or analytical frameworks common across all humanities disciplines. (See Appendix D: List of I-CHASS Projects for a brief introduction to additional projects.) Some of these projects have been successfully implemented, with tangible results; other efforts are still under development but show considerable potential that will be realized and enhanced through the Challenge Grant funding. **The Inscriptifact Spurlock Museum Seals Project.** Building on a long-term collaboration between the University of Illinois and the University of Southern California, I-CHASS is facilitating a cooperative venture that focuses on a collection of ancient cylinder seals currently housed at Illinois’ Spurlock Museum. Researchers needed a way for their students to present the results of their analysis of digitized cylinder seal images. Since the team of student researchers is spread between the two institutions, a system capable of allowing collaborative editing of the site was required. Rather than developing this technology anew, I-CHASS leveraged an advanced portal originally developed for the NEH-funded RiverWeb project. As a continuation and elaboration of this highly successful undergraduate research
partnership, the Challenge Grant-funded Associate Director for Data Analytics and Pattern Recognition will lead a major expansion of the project to digitize an additional four collections of provenanced cylinder and stamp seals. This project achieves two ends: first, it demonstrates the utility of innovative documentation tools that transform the imaging practices for this category of artifacts, both for secure identification and for research benefits; and secondly, it serves as a model, showing how high-resolution image data of basic importance in the humanities can be documented and distributed effectively worldwide through an infrastructure of networked academic institutions and through projects that feature undergraduate research.

E(d) - Emancipating Digital Data: Scanning and Image Analysis of the Lincoln Papers. Focusing on scanned writings of Abraham Lincoln’s communication, I-CHASS in collaboration with NCSA and the Lincoln Presidential Library and Museum in Springfield, Illinois, is creating a managed distributed data repository of materials related to the sixteenth President. The Associate Director for Data Analytics and Pattern Recognition and the Assistant Director in Modeling have charted an initiative to take completed digital scans and use data analytics and forensic studies to trace Lincoln’s correspondence in time and space. An analysis of the concepts of “liberty,” “emancipation,” or the “preservation of the Union,” for example, will reveal when, where, and with whom Lincoln was writing, or even referring to in his correspondence, providing insights into the development of Lincoln’s commitment to these concepts. Challenge Grant funding will allow this initiative to go forward. The E(d) project poses a formidable challenge in historical research from huge volumes of documents where the digital size of scanned writings can be as large as ~150 megabytes for each image scan, reaching ~37 terabytes for the entire collection. The problems of computational requirements to preprocess and analyze data on demand, lack of automated algorithms to transcribe the writings, bandwidth requirements to interact with the data and lack of web interfaces to convey the geospatial, temporal and contextual characteristics might seem insurmountable. E(d) meets these challenges by blending high performance computing for processing image scans with Web 2.0 techniques for interactive learning. The project therefore not only enables knowledge extraction from a large digitized collection of Abraham Lincoln’s writings, it also provides a model that can be applied to other digital collections, such as the Papers of the Founding Fathers.
Unicorn: Toward Enhanced Understanding of Virtual Manuscripts on the Grid. I-CHASS, in collaboration with Illinois’ Program in Medieval Studies and NCSA, has been working with the University of Sheffield’s Department of French and Humanities Research Institute, and the University of York’s Center for Medieval Studies, to digitize and study fifteenth-century manuscripts. The goal of this transatlantic collaboration is two-fold: to understand the production and consumption of books and their place in late medieval culture; and to make the manuscripts available for research and teaching as a model project on the Worldwide Universities Network (WUN) grid. I-CHASS and NCSA are developing a toolkit to enhance and complement resources developed by the EPSRC-funded Pegasus project to create a robust cyberenvironment that supports the study of virtual manuscripts and other high-resolution images. The tools and methodologies generated by the project will serve as an example interdisciplinary research agenda for collaborative digital humanities scholarship.

The HistorySpace Project: Information Rich Virtual Environments for Historical Scholarship. The HistorySpace project is a collaboration led by I-CHASS and Brock University’s John Bonnett, an I-CHASS summer faculty fellow, that explores the creation of high-resolution models of the past, particularly for domains of history such as architectural, urban, and social history where space is an important variable. Information Rich Virtual Environments (IRVEs) will be designed to express combinations of textual, graphic, audio, and three-and four-dimensional forms of expression and will act as innovative platforms for scholarly communication in this century that enhance the analytical, expressive, and pedagogical capacity of historians. Coupled with the emergence of XML (Extensible Markup Language) and related technologies, historians have unprecedented flexibility in both their expression of and interaction with content. XML and its dialects enable historians to easily alter IRVEs to meet their narrative or expressive needs at given points in their narrative. For example, architectural historians will be able to alter buildings, highlighting or removing building constituents as needed, annotating others. Social historians will be able to color code buildings to express the emergence and evolution of important spatio-temporal social patterns—such as the ethnic makeup of a given neighborhood. Significant to the humanities, the HistorySpace Project, led at I-CHASS by the Challenge Grant-funded Associate Director for Human-Computer Interaction, will culminate in the production of
IRVEs that allow non-specialists to construct their own virtual environments using datasets derived from their particular humanities discipline and topic. **Immersive Reading: Gettysburg Comes Alive.** Augmented Reality allows users to view real-world objects in combination with computer-generated data, augmenting the sight, or other senses of the user, to provide additional information. Focusing on enhancing the prize-winning history *The Age of Lincoln* by Vernon Burton, *Gettysburg Comes Alive* will create a reading experience that immerses readers in three-dimensional animated battle scenes. An augmented reality version of *The Age of Lincoln*, developed by the Associate Director for Human-Computer Interaction, will illustrate the strategic topography of battles with three-dimensional, animated graphics. The methodology developed for *Immersive Reading: Gettysburg Comes Alive* has tremendous potential for humanities scholars and their students, allowing them to reveal everything from military tactics of troop movement to the influence of natural geographies on the ultimate success or failure of a campaign in an innovative and interactive environment. **Exploring the Middle Border.** Based on the world-renowned collections of the Newberry Library in Chicago, *Exploring the Middle Border* is an online resource that invites readers to explore the history of mid-continent North America from the seventeenth century to the twentieth century. With a target audience of high school and early college students and their teachers, it offers access to historical primary sources, interpretive essays, and resources. It highlights the globally-connected nature of mid-continent North America by placing the history of the “Midwest” in the context of world history themes such as colonialism, migration, industrialization, and nation-state formation. The project stimulates readers’ interest in history and models ways of interpreting history through primary sources. **Magazines and War, 1936-1939.** Despite nearly three years of warfare and 70 years of wear, hundreds of paper artifacts published during the Spanish Civil War era (1936-1939) remain intact. Historians consider many of these surviving materials to be invaluable to the public, serving as both historical references and as pieces of art; yet many are too rare and fragile to be handled and examined. A multi-phase, multidimensional project, *Magazines and War*, preserved, restored, catalogued, and digitized magazines housed in the University of Illinois’ Rare Book and Manuscript Library and the library of the Museo Nacional Centro de Arte Reina Sofia. The project also launched an interactive website that allows
museum-goers and Web users alike to browse a collection of thirty digitized Spanish Civil War magazines, page by page. The completed website was a Web Awards Finalist at the 11th Annual South By Southwest Interactive Conference and Festival and has been named an honoree for the 2008 Webby Awards, the leading international award recognizing excellence on the internet. **Understanding Computational Requirements of Preservation and Reconstruction.** The size, complexity and heterogeneity of geospatial collections pose formidable challenges for the National Archives and Records Administration in terms of high performance data storage, access, integration, analysis and visualization. The ultimate goal of this project is to allow researchers and archivists interested in preserving data of historical significance to know at what information granularity (the degree of detail or precision contained in data) that data should be gathered in order to reconstruct the event at a later date. The ideal would be to preserve the information exactly, but CPU and storage costs might be prohibitively expensive. Led by the Associate Director for Data Analytics and Pattern Recognition, our approach has been to design a simulation framework that makes use of advanced technologies, high performance computing, and novel computer architectures to provide a platform that allows archivists and other researchers to understand the costs and trade-offs associated with the long-term preservation of electronic records. Our prototype simulation system, “Image Provenance To Learn” (IP2Learn), is designed for a class of decisions based on image inspection and has successfully been used to run simulations that improve our understanding of future archival needs. **Pathways to Humanities Participation in TeraGrid (PHPTG).** I-CHASS is working with TeraGrid to expand its support of humanities research and scholarship. Our Pathways to Humanities Participation in TeraGrid initiative will advance humanities collaborative research and education with high performance computing. PHPTG, through outreach and support, will engage and enable researchers in the humanities to become users of both the TeraGrid and cyberinfrastructure resources and services. PHPTG proposes to systematically deploy, evaluate, and assess the scalability of a set of these strategies, specifically with respect to humanities communities currently underrepresented among TeraGrid users. These pathways are designed to engage new humanities users in using TeraGrid Gateways, domain-specific user-friendly environments tailored to support collaborative research and knowledge discovery. Unimpeded access to
TeraGrid will allow humanities researchers and educators to re-conceptualize old problems and generate new research questions with innovative thinking, methods, and solutions and support interdisciplinary humanities academic studies, research, and education. **ValidNotion: Computer Aided Comparison of User-Contributed vs. Peer Reviewed Online Content.** As electronic publishing becomes ubiquitous, Web 2.0 technologies allow expansion of user-contributed content and contribute greatly to the democratization of wikis, websites, blogs, reviews, and social networking sites. But these innovations leave unaddressed the content’s validity and the impact of user-contributed content on public discourse. Led by the Assistant Director in Modeling, I-CHASS researchers will ground the user-contributed online content with academic peer-reviewed content, focusing on the analysis of the dissemination and evolution of ideas, providing insight into how knowledge and learning are disseminated through digital media and how to evaluate the validity of that content.

**LONG RANGE PLANS FOR INTELLECTUAL DEVELOPMENT**

I-CHASS has intentionally developed the infrastructure to foster connections between the humanities and computing. We offer professional personnel, one-of-a-kind facilities and resources, and existing mutually-beneficial partnerships and collaborations. This infrastructure has positioned I-CHASS to make long-range plans for intellectual development in support of a wide-range of humanities projects. I-CHASS has also developed a business and marketing plan to ensure financial viability. **Personnel:** I-CHASS has a core staff of seven employees, three of whom are temporary until the award of a successful Challenge Grant. In addition to the seven full-time staff, three faculty members from the departments of communications, geography/urban planning, and political science have part-time appointments in I-CHASS/NCSA. Complementing the I-CHASS staff is the considerable experience and expertise of the 250+ researchers, technology specialists, and staff at NCSA in addition to humanities scholars at the University of Illinois and beyond. Graduate and undergraduate students are also employed to support faculty projects and assist in administrative tasks for I-CHASS. I-CHASS is committed to ensuring a new generation of scholars in digital humanities, and therefore the training of undergraduate and graduate students plays a vital role in the projects and the long-term sustainability of the Institute.

I-CHASS has benefited immensely from the advice of an informal group of Illinois faculty that
guided its early development and has now emerged to be the Director’s Council, chaired by Dr. Douglas
Kibbee, Professor of French and Director of the School of Literatures, Cultures and Linguistics. I-CHASS has
also established an International Advisory Board chaired by Dr. Daniel Reed, now with Microsoft. (See
Appendix E: Board of Trustees, Staff, Advisory Board, and Director’s Council.)

The Director of I-CHASS, Dr. Vernon Burton, reports directly to the University of Illinois Provost. The
Executive Director, Dr. Kevin Franklin, supervises the day-to-day running of the Institute’s operations. Both
the director and the executive director consult regularly with the Provost, the Director’s Council, the I-CHASS
Advisory Board, NCSA leadership, and I to discuss the Institute’s strategic direction. The I-CHASS project
manager coordinates I-CHASS projects and serves as the principal humanities domain liaison. Three
associate/assistant directors (currently temporary positions, but to become full-time upon award of the
Challenge Grant) oversee initiatives in data analytics and pattern recognition, human-computer-interaction,
and modeling. They assist scholars to make use of the latest technologies and to identify new research areas.
The I-CHASS Associate Director for Education and Outreach is also the Head of Conferences and Institutes, a
division in the Office of Continuing Education at the University of Illinois. He directs scholarly conferences
and organizes the details necessary for successful workshops and seminars. All I-CHASS staff help
researchers in the humanities find funding for their research initiatives. (See Appendix F: Description of
Funded Positions and Appendix G: Curriculum Vitae.)

Facilities and Resources: I-CHASS shares the resources of the University of Illinois. The university’s large research campus at Urbana-Champaign is strong
in three fields that are key to the success of I-CHASS: the humanities, library science, and computing.
Furthermore, I-CHASS is housed at NCSA, an association that brings massive computing power to the
humanities, enabling new and more complex projects nationwide and offering storage space for large datasets.
But more important is its human expertise. NCSA employs, and helps the university attract, top-level experts
in every field critical to computing. They can provide I-CHASS access to virtualized computational
environments, or on-demand computing, that will allow a variety of hardware/software configurations for the
support of scholarly research. Using the NCSA-developed Software Environment for the Advancement of
Scholarly Research
(SEASR), for example, a researcher can locate documents of interest, extract and synthesize information, or detect long term patterns in a dataset. The resources available at NCSA, harnessed and channeled for the humanities through I-CHASS, can create technologies for digital-humanities research and entire virtual worlds for interactive education and study in the humanities.

NCSA is also a leader in outreach to scholars from all disciplines. It has fellows programs that offer HPC access and cross-disciplinary collaboration opportunities to faculty at the University of Illinois and beyond. Humanities faculty are among those targeted and those fellows hold concurrent appointments at I-CHASS. In addition to the university itself and to NCSA, I-CHASS relies on its new partnership with I-CHASS. In 3 Although I-CHASS has a wider audience and a heavier concentration on the humanities, both I-CHASS and I-CHASS share the mission of providing computing resources to scholars. The university Library, the third largest university library in the United States, conducts a broad range of digital projects, including the digitization of library collections and archives, research in information retrieval technologies for digital collections, and digital library research projects. The University’s Graduate School for Library and Information Science (GSLIS) is the nationally top-ranked department of its kind, and its faculty includes leaders in the digital humanities. John Unsworth, dean of GSLIS, received the National Humanities Center’s 2005 Lyman Award for humanities computing and was the founding Director (1993–2003) of the Institute for Advanced Technology in the Humanities at the University of Virginia. Allen Renear, before joining GSLIS, led one of the country’s first humanities research computing centers, the Scholarly Technology Group at Brown University. Both have served as presidents of the Association for Computers and the Humanities and both are members of the Director’s Council. The Department of Computer Science, recognized throughout the world as a leader in education and research, is eager to bring humanists into contact with computer scientists. This department has agreed to include humanities projects in its senior-year capstone course. With a distinguished record of Humanities publications, the University of Illinois Press has established a Humanities Computing series. In the incubation stage of I-CHASS, the Director worked with the press to publish papers from a conference on Humanities and Social Science Computing hosted at NCSA. This book includes an
accompanying CD with multimedia application, one of the first of its kind. We plan to submit other book manuscripts resulting from I-CHASS sponsored Humanities Research projects to that series to insure influence in the academy.

Other campus units supporting I-CHASS include the College of Liberal Arts and Sciences, the College of Fine and Applied Arts, the College of Business, the College of Education, and the College of Engineering. I-CHASS is also supported by a number of unique interdisciplinary units at the University of Illinois, including the Illinois Program for Research in the Humanities, which promotes interdisciplinary study; the Center on Democracy in a Multiracial Society, a research and teaching institute organized around a commitment to the practice of democracy and equality within a changing multiracial society; the Richard G. and Carole J. Cline Center for Democracy, whose programs nurture, refine, and extend democratic ideals; the Center for Advanced Study, which provides opportunities for creative, interdisciplinary scholarship amongst Illinois’s academic elite; the Academy for Entrepreneurial Leadership, which encourages awareness and initiatives emphasizing the interdisciplinary nature of modern entrepreneurial thinking; the Seedbed Initiative, which encourages scholarship and critical thinking in a wide-ranging exploration of the intersection of art and technology; and the Coordinated Sciences Laboratory, a national leader in information technology and telecommunications research. We also work with the East St. Louis Action Research Project, which uses action research, service learning, and neighborhood partnerships to address the immediate and long-term needs of some of that city’s most distressed communities. Perhaps most important, the Illinois campus has a multitude of strengths in the humanities—art history, philosophy, history and culture, languages and linguistics, and literature most notably. Altogether the package of resources is formidable.

**Partners and Collaborators:** In addition to the relationships and internal partnerships here on the University of Illinois campus, I-CHASS is able to take advantage of national and international collaborations with other institutions that are similarly committed to serving the humanities. We are members of CenterNet, the international network of Digital Humanities Centers, and we are eager to

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\(^7\) Orville Vernon Burton, ed., *Computing in the Social Sciences and Humanities* (2002) and an accompanying CD with more than 65 essays and research and teaching applications, including illustrative interactive multimedia materials Burton, et al., *Wayfarer: Charting Advances in Social Science and Humanities Computing* (2002).
partner with them and with other digital centers in the U.S. We are a part of the Great Lakes Consortium for Petascale Computation, of the Worldwide Universities Network grid, and of HASTAC, the Humanities, Arts, Science and Technology Advanced Collaboratory. As one of the founding members of HASTAC, I-CHASS and NCSA hosted HASTAC’s second organizational meeting at the NCSA Access Center in Washington, DC in January 2004. Other examples of I-CHASS’ collaborations include: a partnership with the University of Southern California in developing the Spurlock Museum Seals Project; a close relationship with the Newberry Library in developing their Exploring the Middle Border project; a collaboration with the Lincoln Presidential Library and Museum in Springfield; partnerships with the University of Minnesota, University of Michigan, and Queens College (New York) to develop tools for mining and mapping an on-line census repository; and hosting and supporting of the National Lincoln Bicentennial Commission’s website. Internationally, I-CHASS is working with Brock University in Canada on using agent-based simulations to explore historical counterfactuals, with the Costa Rica Center for High Technology (CeNAT) to develop a Central American Digital Library, and with the University of Sheffield and the University of York in the United Kingdom. In 2007 I-CHASS organized a workshop in collaboration with the UK’s Arts and Humanities e-Science Initiative, held at NCSA and entitled E-Science in the Arts and Humanities: An Early Adopters’ Forum. (Appendix I: Letters of Support for more information on these partnerships.) Classroom and Educational Benefits: For many humanities researchers looking to broaden their use of technology, change has been spurred largely by the classroom and lecture hall as they have sought innovative means of providing students with texts or original sources to “teach” them how to work in a particular discipline. Many of the ongoing projects supported by I-CHASS include components based in humanities classrooms, exposing undergraduate and postgraduate students to existing digital standards and methodologies, in addition to more traditional forms of learning. Digital humanities inherently blur the boundaries between research and education. I-CHASS staff, including those funded through this proposal, will constantly look for ways in which new technologies can be applied to teaching—and they may well find ways that are beyond current imagining. Teachers have been at the forefront of digital humanities research and are narrowing the gap between “teaching” and “research.” For instance, teachers
and students can retrace and visualize the steps they used to learn or research information, which can then be compared with how others “learned” about the same research problem. **Conferences:** Long-term intellectual development depends on diffusing information to the community through conferences. Conferences organized by I-CHASS are structured to meet at least two of the following three aims: to provide a showcase for the latest breakthroughs and intellectual work accomplished through digital humanities; to present an opportunity to look towards future research directions; and to offer practical training sessions for researchers and educators interested in incorporating digital technologies in their research and classrooms. An example of how these aims can be successfully accomplished was the I-CHASS December 2006 conference, “Spatial Thinking in the Social Sciences and Humanities.” Targeted at researchers and educators interested in using spatial analysis techniques, the work presented at this conference focused on how spatial thinking affects substantive findings and changes the way research questions are approached, as well as assessing the role of computation in that research. Presenters shared their perspectives on the future role of a humanities cyberinfrastructure. In addition to the research presented at this conference, instructional staff, professors, students, researchers, and K-12 teachers were invited to participate in a hands-on introduction to ArcGIS, an industry-standard software system for authoring, serving, and using geographic information. These break-out sessions were held concurrently with the main program. As with many of I-CHASS’ conferences and workshops, this conference was broadcast over the Access Grid (a video-conferencing tool) to other interested institutions.

**ASSESSMENT PLAN**

I-CHASS currently employs qualitative and quantitative assessments to gauge its effectiveness. We submit annual and quarterly reports to NCSA, I3, the Vice Chancellor for Research, the Provost, and I-CHASS Advisory Board, outlining in narrative and quantitative form our activities and expenditures. Because I-CHASS serves as a nexus of scholarship, creativity, and technical expertise, assessment reports include how we provided research support, advanced computing resources, and collaborative tools to our communities. Quarterly reports include the quantity of workshops and conferences, postdoctoral and faculty, national, and international fellowships, and how our work showcases the future direction of scholarship in the humanities. Quantitative measures include the number of projects facilitated,
additional research-grant dollars attracted, numbers of faculty and students involved (with unit designations),
attendance and presentations at conferences, and peer-reviewed publications. Qualitative evaluation is done
by expert observation and by interviews and/or surveys.

Proper evaluation will ensure that I-CHASS effectively and efficiently manages the implementation of this
grant, and our current procedures can be extended to include its impact. The annual report will include the
condition of the Endowment Fund in relation to spendable and reinvested yields. We will monitor the depleting
funds of the Challenge Grant to verify its use for training endeavors. Evaluation experience gained from
previous Challenge Grant successes at the University will help I-CHASS’ assessment procedures. A new
process for evaluating the impact—and the performance of I-CHASS generally—will be designed in
conjunction with NCSA and I, who together have decades of experience in assessment and a strong interest in
optimal I-CHASS performance. Assessment includes meeting fundraising goals, staff productivity, and
program effectiveness. PREVIOUS NEH CHALLENGE GRANT SUCCESS The University of Illinois has
been awarded two prior NEH Challenge Grants. In 1977, WILL-AM-FMTV received $90,000 to fund a short-
term series of tune-in advertising for arts and humanities programming. WILL raised the $270,000 matching
requirement through a combination of on-air fundraising aimed at viewers who had yet to become members,
and direct-mail appeals to current members of the Friends of WILL. The second Challenge Grant was awarded
to the University Library in 1988 to support humanities acquisitions, preservation of humanities-related books
and manuscripts, and bibliographic control of the Library’s extensive manuscript and rare book collections.
The matching requirements of the grant were met on schedule, and the programs created by the $4 million
endowment continue to flourish and benefit the community. To date, that endowment has supported a range of
initiatives at the Library including completion of its H. G. Wells manuscript collection; the purchase of the
Chadwyck-Healey CD-ROM series on British and American literature; the preservation of the Julian Steward
Native American and Cultural Anthropology Papers; the transferring of historically significant silent films to
safety stock; the digitization of the Benevolent Dictators Advertising Collection; and the cataloguing of
overlooked collections, including a collection of over 500 volumes of Spanish plays.
The University of Illinois administration is fully committed to I-CHASS. The University Campus Strategic Plan features three priorities, two of which align directly with I-CHASS goals: a renewed commitment to the humanities, and a campus-wide focus on informatics. NCSA, I^3, and the Provost already provide financial support. NCSA also provides office space, support staff, including a grant office to assist with proposals, and server capacity, in addition to its funding of several staff positions. NCSA Public Affairs assists with web design for I-CHASS, takes the lead in producing brochures, and helps develop materials for fundraising efforts. The University’s Office of Continuing Education, with their expertise in public engagement, assists in organizing our workshops and scholarly conferences.

Fundraising for the Challenge Grant match will be coordinated through the University of Illinois Foundation and the office of the new campus Vice Chancellor for Development and Advancement. In June 2007, the university announced a capital campaign for $2.5 billion, and by December 31, 2007, the Brilliant Futures Campaign had raised over half of that goal. Matching the NEH Challenge Grant will be part of this campaign and well within the range of the University of Illinois Foundation’s performance. The university will highlight its strengths in the humanities as it seeks matching funds for the NEH Challenge Grant. Both the President of the University and the Chancellor of the Urbana campus have existing relationships with industry leaders and have promised to be advocates for I-CHASS in their frequent contacts with large potential donors (see letters of support from the President and Chancellor). The reputation of NCSA in information technology and applied technology in research and teaching curricula, together with the strength of the humanities at the University of Illinois, almost guarantee successful fundraising efforts.

Burton has met with Craig Bazzani, Interim Associate Chancellor for Development, James Schroeder, Vice Chancellor for Institutional Advancement, and Sidney S. Micek, UI Foundation Director, as well as Scott Koeneman, Associate Director of Development for the College of Liberal Arts and Sciences, and members of their staffs to develop plans for generating matching funds. The UI Foundation and the Office of Campus Development strongly support I-CHASS and our Challenge Grant application. They will help identify major gift prospects, of whom several promising categories are as follows:
Alumni—Brilliant Futures targets a potential donor pool that includes the largest active alumni association of any university. Many of the institution’s alumni have gone on to distinguished careers in areas related to the humanities, while others have assumed leadership positions at some of the nation’s leading technology firms. Illinois alumni have been generous in funding projects that include the use of technology; in 1985, Arnold and Mabel Beckman funded the Beckman Institute for Advanced Science and Technology with a gift of $40 million and, in 1999, Thomas Siebel, an undergraduate history major at Illinois, donated $32 million for a building to house the Computer Science Department and a further $100 million in 2007. The UI Foundation has regional gift officers (one whose territory includes Silicon Valley) who will meet with targeted alumni and other potential donors from across the country and will use the NEH Challenge Grant to garner support for the humanities from alumni and businesses interested in supporting digital humanities programs. One alumnus, who has requested anonymity, is prepared to make a substantial donation to I-CHASS, but only if the Challenge Grant application is successful. For the alumni who have benefited from or have had an interest in computing as well as humanities, an NEH-endorsed humanities computing center is attractive for generating funds.

NCSA Corporate Partners—NCSA has a successful Private Sector Program that currently has long-term partnership agreements with over twenty Fortune 200 companies, and their association with NCSA provides accessibility and special opportunities for I-CHASS. Since its initial roll-out in 1986, the Private Sector Program has produced $100 million in added revenue for NCSA and approximately $14 million and additional support for at least 27 other campus units. NCSA facilitates meetings between I-CHASS and company partners and will continue to do so into the future.

Foundations and Technology Vendors—I-CHASS will approach foundations that have historically been supportive of humanities computing. The University of Illinois has been very successful in attracting funding from the Andrew W. Mellon Foundation for both humanities and humanities computing. In December 2002, the university was awarded $1.25 million over four years for the Chancellor’s “Mellon Humanities Initiative” to strengthen humanities disciplines and encourage cross-disciplinary scholarship. Also in 2002, the Mellon Foundation awarded $1 million to the University Library for a program to protect and preserve endangered library materials. In June 2006 Mellon
provided another grant of $600,000 to the Library for online cataloguing of the Rare Book and Special Collections Library. GSLIS and NCSA received a joint grant from Mellon in 2003, $390,000 specifically for humanities computing (music data retrieval), and in 2004 GSLIS received a Mellon Grant for $599,000 for humanities computing tools development, including data mining. In December 2006, GSLIS received a $1 million grant for a digital humanities text-mining project. In August 2007, GSLIS and NCSA were awarded a $1.2 million grant from Mellon to develop a Software Environment for the Advancement of Scholarly Research.

Support has also come from technology vendors such as IBM, Apple, Microsoft, and Intel, which have provided equipment for research, development, and instructional use. I-CHASS has already enlisted a corporate supporter. Apple, Inc. has committed to work with us to offer consulting and training time on their products and solutions and is eager to develop a long-term partnership. I-CHASS is located close to three large cities that are home to industries that can be targets for donor support. The business communities in Chicago, Indianapolis, and St. Louis support this region economically and provide a natural constituency for successful fundraising.

*The Academy for Entrepreneurial Leadership*—Funded by the Ewing Marion Kauffman Foundation and located in the Research Park, the Academy has provided I-CHASS with funds for a graduate research assistant to identify area firms and groups, especially high tech firms, which could be likely donors to help us meet the Challenge Grant. The Academy advises I-CHASS on entrepreneurship and will assist in identifying potential donors. I-CHASS will participate fully in the fundraising effort and will use all resources at its disposal. Burton and Franklin, with support from staff, will make themselves available to meet with development officers and potential donors as appropriate. **CONCLUSION** We are requesting this NEH Challenge Grant at a critical juncture. Local campus support for humanities computing has never been higher, but as with other academic institutions our continued success is reliant on securing additional funding to formalize our staffing and workshop initiatives. The University of Illinois’ Strategic Plan calls for work in the field of informatics and for new programs in the humanities
that create the next generation of scholarship and foster new collaboration between traditional research areas and informatics. And, according to NCSA’s strategic plan, “Cyberenvironments and the underlying cyber-resources will fundamentally transform research and education in science and engineering as well as in the arts, humanities, and social sciences over the next decade.” I-CHASS can help create that transformation. NEH is vested in supporting current state-of-the-art humanities projects and in developing new technologies targeted at humanities applications. Specifically, NEH is working “to provide humanities scholars with access to high-performance computing.” I-CHASS can be a mechanism for that support.

I-CHASS is now a vital part of the national and international humanities community. Across the nation humanists have asked how they can take advantage of this unprecedented level of computational power, and I-CHASS is uniquely positioned to provide humanities scholars with advanced computational resources, both human and technological. I-CHASS has built an environment for advanced digital humanities scholarship into which NEH and other humanities centers can place their own principal researchers and students. Furthermore, I-CHASS is taking the initiative in creating a national agenda on cyberenvironments for the humanities. Dr. Raymond L. Orbach, Director of the Office of Science, U.S. Department of Energy testified before the House of Representatives in July 2003 about the central importance of supercomputing capability, and specified the humanities, as well as the sciences, as a critical field of inquiry. He spoke more recently at an NEH conference on Digital Humanities, where he reiterated the need for the humanities to use supercomputing. I-CHASS and NCSA stand ready to make this happen. The people at I-CHASS have long been associated with bringing computing capabilities to the humanities and have supported viable, ground-breaking initiatives in the field. They have significant experience, have built important relationships with scholars and practitioners, and have built bridges to others in this growing community. Working with humanities-based and technology-based partners, they will move this national and international effort forward.

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8 www.oc.uiuc.edu/announcements/Urbana_Strategic_333.pdf; see especially pages 36 and 38-40.
10 http://www.science.doe.gov/Sub/speeches/Congressional_Testim/7_16_03_testimony.htm
11 Please see https://listserv.umd.edu/cgi-bin/wa?A2=ind0704&L=mith-community&D=1&P=1917 for more information.
This proposal is also timely within a larger context not addressed in this narrative but that underlies current national concerns. Many humanists are now calling for an increased focus on new digital techniques to rectify our failure to understand our own human nature and its rich and diverse contexts, our reluctance to communicate and collaborate across cultural boundaries, and our inability to see and appreciate the full range of human creativity, inspiration, and aspiration. A 2006 report from the American Council of Learned Societies (ACLS) declared that “digital scholarship is the future of the humanities and social sciences, and digital literacy is a matter of national competitiveness.” The report recommends the establishment of “national centers to support scholarship that contributes to and exploits cyberinfrastructure.” The ACLS report also includes recommendations for social science disciplines that it defines as “interpretative” and “have humanistic content and employ humanistic methods.” I-CHASS—the Institute for Computing in Humanities, Arts, and Social Science—is precisely the kind of center that merges humanities and social-science as well as technology and high performance computing. I-CHASS, with unique assets and a wide range of digital humanities work already under way, is ideally situated to become a unique and major national resource.

A successful NEH Challenge Grant application will reaffirm the strong institutional partnerships that are demonstrated in this proposal and strengthen both I-CHASS and the humanities community as a whole. The temporary assignment of three staff positions will be made permanent and the advances that have already been made by our staff and accompanying workshops and mini-residencies will be enhanced and extended by this funding. An NEH-endorsement will enable us to reach out beyond our solid base to attract additional support, helping establish I-CHASS as a leader in computational humanities that would have a broad and lasting influence.

## APPENDIX A: URLs AND GLOSSARY

### URLs

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<tr>
<th>NAME</th>
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<tr>
<td>(EPIC) Engineering and Physical Sciences Research Council (EPSRC),</td>
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<td>Magazines &amp; War, 1936-1939: Spanish Civil War Print Culture</td>
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<td>National Center for Supercomputing Applications (NCSA) National</td>
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<td>Endowment for the Humanities, &quot;Humanities High Performance</td>
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<td><a href="http://www.neh.gov/ODH/ResourceLibrary/HumanitiesHighPerf">http://www.neh.gov/ODH/ResourceLibrary/HumanitiesHighPerf</a></td>
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NAME

NINES, Networked Infrastructure for Nineteenth-century Electronic Scholarship Papers of Abraham Lincoln (PAL)

PHYSNET: Physical Interaction Using the Internet Representations of Status in the British Novel, 1750-1850: Metadata Offer New Knowledge (MONK) Project Riverweb Project

San Diego Supercomputing Center (SDSC) Software Environment for the Advancement of Scholarly Research, National Center for Supercomputing Applications (SEASR) Spatial Thinking in the Humanities, Arts, and Social Science Conference

Supercomputing 07 Conference
Supercomputing 08 Conference
TeraGrid University of Illinois at Urbana-Champaign (UIUC) University of Illinois Foundation
University of Illinois Press
University of Illinois, Academy for Entrepreneurial Leadership
University of Illinois, Beckman Institute for Advanced Sciences and Technology University of Illinois, Campus Strategic Plan University of Illinois, Center for Advanced Study (CAS) University of Illinois, Center on Democracy in a Multiracial Society (CDMS) University of Illinois, Cline Center for Democracy University of Illinois, College of Business University of Illinois, College of Education University of Illinois, College of Engineering

Universal Resource Locator (URL):

http://www.nines.org/
http://www.papersofabrahamlincoln.org
http://isda.ncsa.uiuc.edu/teleimmersiveSpace/
http://monkproject.org/
http://www.riverweb.uiuc.edu/
http://www.sdsc.edu/
http://seasr.org/
http://www.ncsa.uiuc.edu/Conferences/SpatialThinking/
http://sc07.supercomputing.org/
http://sc08.supercomputing.org/
http://www.teragrid.org/index.php
http://www.uiuc.edu
http://www.uif.uillinois.edu/
http://www.press.uillinois.edu/
http://www.business.uiuc.edu/ael/
http://www.beckman.uiuc.edu/
http://www.strategicplan.uiuc.edu/
http://www.cas.uiuc.edu/
http://cdms.ds.uiuc.edu/
http://www.clinecenter.uiuc.edu/
http://www.business.uiuc.edu/
http://www.ed.uiuc.edu/
http://www engr.uiuc.edu/
**Name**

University of Illinois, College of Fine and Applied Arts (FAA) University of Illinois, College of Liberal Arts and Sciences (LAS)

University of Illinois, Conferences and Institutes (CI) University of Illinois, Coordinated Sciences Laboratory (CSL) University of Illinois, Department of Computer Science (CS) University of Illinois, East St. Louis Action Research Project (ESLARP)

University of Illinois, Graduate School for Library and Information Science (GSLIS) University of Illinois, Program in Medieval Studies University of Illinois, Research Park

University of Illinois, Seedbed Initiative University of Illinois, University Library University of Manchester, National Centre for Text Mining

University of Minnesota, Minnesota Population Center University of Sheffield, Department of French University of Sheffield, Humanities Research Institute University of Southern California, Institute for Multimedia Literacy (IML) University of York, Centre for Medieval Studies Western Hemisphere Slavery Project: Afro-Louisiana History and Genealogy Western Hemisphere Slavery Project: Race and Slavery Petitions Project

**Universal Resource Locator (URL):**

http://www.fa.uiuc.edu/

http://www.las.uiuc.edu/

http://www.continuinged.uiuc.edu/conferences/

http://www.csl.uiuc.edu/ http://www.cs.uiuc.edu/

http://www.eslarp.uiuc.edu/

http://www.lis.uiuc.edu/

http://www.medieval.uiuc.edu/

http://www.researchpark.uiuc.edu/

http://www.admin.uiuc.edu/initiatives/artsintech.html

http://www.library.uiuc.edu http://www.nactem.ac.uk/

http://www.pop.umn.edu/

http://www.shef.ac.uk/french/

http://www.shef.ac.uk/hri/

http://iml.usc.edu/

http://www.york.ac.uk/inst/cms/

http://library.uncg.edu/slavery_petitions/

http://www.will.uiuc.edu/

http://www.wun.ac.uk/
Glossary

Cyberenvironments are easy-to-use interfaces that provide access to local and shared data stores and data sets, computing systems, networks, applications, data analysis and visualization tools, and services, all within a secure framework.

The term cyberinfrastructure describes new research environments that support advanced data acquisition, data storage, data management, data integration, data mining, data visualization and other computing and information processing services over the Internet.

Distributed computing is a method of computer processing in which different parts of a program run simultaneously on two or more computers that are communicating with each other over a network.

Distributed data repositories contain datasets shared between two or more servers that can be in different locations.

Geospatial collections are datasets encoded with geographically referenced information.

High performance computing (HPC) refers to the use of supercomputers, capable of performing calculations many times faster than standard desktop machines.

A petascale facility operates a supercomputer capable of making arithmetic calculations at a sustained rate in excess of 1,000-trillion operations per second (a “petaflop” per second) to help investigators solve some of the world’s most challenging research problems.

TeraGrid is an open scientific discovery infrastructure combining resources at eleven partner sites to create an integrated, persistent computational resource.
APPENDIX B: PROTOTYPE CYBERENVIRONMENT

I-CHASS is developing cyberenvironments that will enable humanities researchers and educators to take full advantage of the nation’s cyber-resources. Cyberenvironments integrate distributed computing and data resources into end-to-end processes. They couple traditional desktop computing environments with the resources and capabilities of a national cyberinfrastructure to provide researchers and educators with an integrated environment that facilitates collaboration across disciplinary as well as geographical boundaries. They include applications, graphical user interfaces, and portals for easy interaction with the applications, and workflow and collaboration software, as well as an integrated data analysis and visualization capability. Professionals with broad expertise in content production and technology systems working with interdisciplinary humanities teams are essential to exploit the full power of cyberinfrastructure. Through its close ties with NCSA, I-CHASS is at the forefront of cyberenvironment innovation and has direct experience in its implementation. Figure 1 illustrates the structure of a typical humanities cyberenvironment that combines disparate tools to facilitate new discoveries. It features:

- **Seamless Accession of Print Materials** Automatically digitizes print materials and sends image files to a user’s desktop.
- **Collaboration and Dissemination** Digital materials available to project collaborators via a secure internal portal with features such as annotations and linking functionality. System allows individual documents or collections of documents to be accessible to the public via customizable interfaces, with narratives or other related content.
- **Data and Computational Tools** Array of relevant computational tools built into system. As an end-to-end portal, the cyberenvironment allows users to work with a dataset and select computational tools to analyze it and receive the resulting output as a processed file.
- **Seamless Data Conversion** Files translated internally to a selection of common formats without any user intervention, including automatic georeferencing of locations mentioned in text to allow spatial data analysis.
- **Grid-enabled** Leverages grid resources as needed, for both storage and computation needs.
- **Discoverability** Supports discoverability so that other sites can search and retrieve the public content of the system.

This type of complex interplay of processes is not possible in today’s fragmented assortment of tools and data sources. Users must spend a great deal of time locating and compiling local stores of data and transferring necessary files back and forth. Tools often require very specific file formats, and so data must constantly be converted between many formats, and users must be proficient with a variety of different storage and computational tools to manage this process. The creation of cyberenvironments that feature end-to-end solutions addresses this entire information cycle by creating a transparent workflow that allows non-technical users to create shared data warehouses and apply a variety of computational tools to their data without worrying about underlying technical issues.
Figure 1: An illustrative cyberenvironment for the humanities
# APPENDIX C: LIST OF SPONSORED WORKSHOPS AND CONFERENCES

<table>
<thead>
<tr>
<th>Date</th>
<th>Workshop</th>
<th>Location</th>
<th>Participants</th>
<th>Sponsoring Organization</th>
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</thead>
<tbody>
<tr>
<td>December 2005</td>
<td>Introduction to Digital Humanities</td>
<td>NCSA</td>
<td>100</td>
<td>I-CHASS</td>
</tr>
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<td>February 2006</td>
<td>Text Encoding Initiative</td>
<td>Champaign, IL</td>
<td>20 per year</td>
<td>I-CHASS and GSLIS</td>
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<td>Using iLife 06 in Teaching and Research</td>
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<td>50</td>
<td>Apple, Inc.</td>
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<td>Summer 2006</td>
<td>Cyberinfrastructure in the Humanities, Arts, and Social Sciences</td>
<td>SDSC</td>
<td>60</td>
<td>National Science Foundation/ EPIC</td>
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<td>September 2006</td>
<td>Katrina: After the Storm – Civic Engagement Through Arts, Humanities and Technology</td>
<td>NCSA</td>
<td>150</td>
<td>I-CHASS/NCSA/University of Illinois</td>
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<tr>
<td>December 2006</td>
<td>Spatial Thinking in the Social Sciences and Humanities</td>
<td>NCSA</td>
<td>80</td>
<td>I-CHASS/EPIC</td>
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<tr>
<td>June 2007</td>
<td>e-Science for Arts and Humanities Research: an Early Adopters Forum</td>
<td>NCSA</td>
<td>25</td>
<td>I-CHASS/King’s College, London</td>
</tr>
<tr>
<td>Date</td>
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<td>Location</td>
<td>Participants</td>
<td>Sponsoring Organization</td>
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<tr>
<td>June 2007</td>
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<td>NCSA</td>
<td>400</td>
<td>GSLIS /I-CHASS/NCSA/University of Illinois</td>
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<tr>
<td>Summer 2007</td>
<td>ComputationalMethods in Humanities, Arts, and Social Science</td>
<td>SDSC</td>
<td>35</td>
<td>Supercomputing 07 Education Committee/TeraGrid</td>
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<tr>
<td>April 2008</td>
<td>Supercomputing 08 Planning Workshop</td>
<td>NCSA</td>
<td>20</td>
<td>Supercomputing 08 Education Committee</td>
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<tr>
<td>Summer 2008: June 2-June 5</td>
<td>Data-Mining in the Humanities</td>
<td>NCSA</td>
<td>45 (anticipated)</td>
<td>Mellon Foundation/SEASR /NCSA/IllinoisInformatics Initiative (I3)</td>
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<tr>
<td>Summer 2008: July 13-July 19</td>
<td>Bio-Nano-Info-Socio Workshop</td>
<td>San Jose, Costa Rica</td>
<td>30 (anticipated)</td>
<td>I-CHASS, NCSA, ARTCA</td>
</tr>
<tr>
<td>Summer 2008: July 27-August 3</td>
<td>High PerformanceComputing</td>
<td>NCSA</td>
<td>35 (anticipated)</td>
<td>Supercomputing 08 Education Committee</td>
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APPENDIX D: LIST OF I-CHASS PROJECTS

I-CHASS has worked on, and is exploring, more projects than are described in the main narrative of this proposal. Projects currently underway at I-CHASS generally fall into one of two categories: either content-based digital scholarship and research or analytical frameworks common across all humanities disciplines. The following pages describe these projects and collaborations and demonstrate the variety of scholarly research and education that we support.

18thConnect
The principles that have guided the development of NINES, an online finding aid for the nineteenth century, are now being extended into the eighteenth century through a collaboration between Miami University, I-CHASS, and the University of Illinois. 18thConnect will provide the first comprehensive means of organizing on-line materials before 1800. Eighteenth-century historians, literary scholars, and philosophers face a major problem: the archive of most, but not all, books published in England between 1700 and 1800 has been digitized by Gale Group at an extremely high price. The search engine deployed by Gale for its image-only texts threatens to limit, by its deficits and omissions resulting from machine error, our capacity to understand Enlightenment thought, the development of modern science, history painting, the rise of the novel, the foundations of modern psychology, and other important topics. The developers of 18thConnect are working closely with the NINES project at the University of Virginia to develop software that searches and organizes early printed books in a more accessible format. The funding provided by the Challenge Grant will enable the Associate Director for Data Analytics and Pattern Recognition to lead this collaboration in order to produce an open platform for eighteenth century scholarship.

The Cartography of American Colonization Database (CACD)
For map scholars, the advent of digital technologies has created access to thousands of fragile, rare images, presented in stunning detail and vivid color. The accelerating pace of digitization, however, had bounded past the older bibliographic resources—an eclectic array of massive printed tomes—that still serve as the primary gateway to historical cartographic images. CACD seeks to organize this bewildering abundance of freely available content in ways that encourage scholars, teachers, and students to understand maps in broader geographic and historical contexts. CACD will provide links to images of 1,000 selected “milestone maps” that changed how early Americans perceived the contested spaces of the hemisphere. It will also develop pilot modules that draw together approximately 500 other images, including unique manuscript materials, organized around specific research themes.

CACD, designed in conjunction with the Challenge Grant-funded positions, will bring together records of available high-quality digital images of maps, plans, and charts maintained by libraries and archives around the world. Although it will function as a clearinghouse of image links, bibliographic information, and other metadata from existing online collections, the CACD will be more than a “WorldCat” for early modern maps of the Western Hemisphere. Every database record will be exhaustively indexed, allowing users to conduct sophisticated searches to identify map images, link them together in a series, view and (when possible) download them. Of particular concern during this process of creating a searchable record of map information will be attention to how maps are linked to one another, by influence or shared geographic content. This dramatically enhanced searching capability will make it possible for CACD users to build maps collections tailored to their own research interests for analysis and interpretation.

Countering Race-hate in Cyberspace
College campuses across the country are experiencing an explosive increase in incidents of cyber-racism. News of racially-themed parties, racist cartoons, posters, pictures of nooses, etc. disseminated through Facebook, MySpace, and other web sites occur almost daily. I-CHASS is working with the University of
Illinois’ Center on Democracy in a Multiracial Society to automatically catalog and analyze the nature, prevalence, distribution, reactions, and other characteristics of racist postings on college campus-linked websites. The project uses online focus groups and surveys to explore how social networking sites are used to express student perceptions of school and campus climate. The project empowers students to respond to race-hate in cyberspace and model how to use social networking sites as extensions of the classroom by developing curricular materials and software, including Facebook Applications.

**Cultural Explorer**

*Cultural Explorer* demonstrates the potential for new technologies to transform the nature of humanistic research and teaching. This “metaproject” encompasses a broad array of the challenges of digital humanities, and promises to shed new light on the historical dynamics of a city at the crossroads of American life, East Saint Louis. A model for what can be achieved on a national basis, the Cultural Explorer team—including history, history of art, linguistics, literature, and music—focuses on three key interrelated areas: the acquisition and digitization of a diverse corpora of cultural data and artifacts; the representation and storage of this data once it has been acquired; and finally the presentation of this body of work to other scholars and the general public. The data includes handwritten manuscripts and historical documents in a number of languages and dialects, maps, census data, and geographically-located musical recordings and sounds. The organization, storage and retrieval of the data will permit us to discover the cultural and human intersections and interactions at a level of complexity heretofore impossible. Finally, through such technologies as dynamic web sites and interactive three-dimensional worlds, the *Cultural Explorer* will disseminate the knowledge created, and provide an ideal environment to expose students to a broad array of digital humanities technologies.

**Cultural Informatics**

Our society is being transformed by computing and information technologies in ways that were hardly envisioned just two decades ago. Computing, information and communications technologies, digital media, computer graphics and music, and various narrative styles are creating new art forms. Led by Michael Ross, Director of the Krannert Center for the Performing Arts, researchers involved in the *Cultural Informatics* initiative will explore the many creative applications of these digital technologies. The project will apply information science and technology to new aesthetic works, public engagement, formal and informal education, the performing arts, museum and other exhibition venues, and design strategies that affect society. Funding from the Challenge Grant will enable the Associate Director for Data Analytics and Pattern Recognition to collaborate with this initiative.

**E(d)**2 -Emancipating Digital Data: Scanning and Image Analysis of the Lincoln Papers

Focusing on scanned writings of Abraham Lincoln’s communication, I-CHASS in collaboration with NCSA and the Lincoln Presidential Library and Museum in Springfield, Illinois, is creating a managed distributed data repository of materials related to the sixteenth President. The Associate Director for Data Analytics and Pattern Recognition has charted an initiative to take completed digital scans and use data analytics and forensic studies to trace Lincoln’s correspondence in time and space. For example, an analysis of the concepts of “liberty,” “emancipation,” or the “preservation of the Union,” will reveal when, where, and with whom Lincoln was writing, or even referring to in his correspondence, providing insights into the development of Lincoln’s commitment to these concepts. Challenge Grant funding will allow this initiative to go forward. The *E(d)* project poses a formidable challenge in historical research from huge volumes of documents where the digital size of scanned writings can be as large as ~150 megabytes for each image scan, reaching ~37 terabytes for the entire collection. The problems of computational requirements to preprocess and analyze the data on demand, lack of automated algorithms to transcribe the writings, bandwidth requirements to interact with the data and lack of web interfaces to convey the geospatial, temporal and contextual characteristics might seem insurmountable. *E(d)* meets these challenges by blending high performance computing for processing image scans with Web 2.0 techniques for interactive learning. The project therefore not only enables knowledge extraction
from a large digitized collection of Abraham Lincoln’s writings, it also provides a model that can be applied to other digital collections, such as the Papers of the Founding Fathers.

Enhanced Knowledge Discovery for Social History
Social historians struggle with the problem of describing accurately the attitudes and experiences of underrepresented populations—risking monologizing and so re-objectifying and potentially skewing representations of them, however sympathetic or disinterested new histories attempt to be. Through augmenting conventional prosopography—“a means of profiling any group of recorded persons linked by any common factor”—with text mining tools and services, we seek to help historical researchers to develop more nuanced perspectives of the vast data collections now available to them. With supporting data synthesis technologies, researchers will be able to sift through accumulated records for patterns with greater refinement and ease, changing parameters to suit research queries as they develop. They will also be able to target key individuals, events, or trends for further in-depth analysis, supporting “thick” or “micro” historical description.

In collaboration with the University of Minnesota, we propose to create a historical search system based on text mining that would supply a powerful research tool for the exploration and discovery of patterns and facts from a variety of historical document collections. Computer enhanced entity extraction is the next logical step for increasing the research value of historical archives. Many historical methods of inquiry begin with quantifiable data that is dispersed within and across texts, and so are difficult for researchers to assemble, except through painstaking and costly labor. Such automated data analysis can also produce faster, more comprehensive, and potentially more nuanced results than researchers can through pen and paper efforts.

Exploring the Middle Border
Based on the world-renowned collections of the Newberry Library in Chicago, Exploring the Middle Border is an online resource that invites readers to explore the history of mid-continent North America from the seventeenth century to the twentieth century. With a target audience of high school and early college students and their teachers, it offers access to historical primary sources, interpretive essays, and resources. It highlights the globally-connected nature of mid-continent North America by placing the history of the “Midwest” in the context of world history themes such as colonialism, migration, industrialization, and nation-state formation. The project stimulates readers’ interest in history and models ways of interpreting history through primary sources.

Grand Challenges in the Humanities
Bringing together groups of researchers, scholars, educators, and computing specialists, Grand Challenges in the Humanities serves as an opportunity for the integration and collaboration of humanities research with existing Grand Challenge programs. Synching with these projects, including those in the social sciences and sciences, Grand Challenges in the Humanities will bridge the disciplinary gap to develop integrated approaches across topics, systems, and unexplored areas of research.

The HistorySpace Project: Information Rich Virtual Environments for Historical Scholarship. The HistorySpace project is a collaboration led by I-CHASS and Brock University’s John Bonnett, an I-CHASS summer faculty fellow, that explores the creation of high-resolution models of the past, particularly for domains of history such as architectural, urban, and social history where space is an important variable. Information Rich Virtual Environments (IRVEs) will be designed to express combinations of textual, graphic, audio, and three-and four-dimensional forms of expression and will act as innovative platforms for scholarly communication in this century that enhance the analytical, expressive, and pedagogical capacity of historians. Coupled with the emergence of XML (Extensible Markup Language) and related technologies, historians have unprecedented flexibility in both their expression of and interaction with content. XML and its dialects enable historians to easily alter IRVEs to
meet their narrative or expressive needs at given points in their narrative. For example, architectural historians will be able to alter buildings, highlighting or removing building constituents as needed, annotating others. Social historians will be able to color code buildings to express the emergence and evolution of important spatio-temporal social patterns—such as the ethnic makeup of a given neighborhood. Significant to the humanities, the HistorySpace Project, led at I-CHASS by the Challenge Grant-funded Associate Director for Human-Computer Interaction, will culminate in the production of IRVEs that allow non-specialists to construct their own virtual environments using datasets derived from their particular humanities discipline and topic.

**Human-and Cyber-infrastructures to Study and Combat Violence**

From religious violence in the Late Roman Empire to the persecution of Jews, Muslims, lepers, and prostitutes in the Middle Ages, to the state-sponsored violence of conquest in the fifteenth century Atlantic world, through lynching in the nineteenth century American South and into contemporary domestic abuse and gang violence, men and women of all races, nationalities, income levels, and geographic spaces have been touched by violence. The sheer numbers of incidences of violence historically are staggering and the complexity and sheer number of variables that interlock the social, cultural, economic, and political issues underlying violence prove daunting when considered across temporal and geographic spaces. Because of this, the study of violence has fragmented along disciplinary lines and become the domain of specific scholarly subfields. Historians of the American South and African-American studies concentrate on lynching; scholars working on religious persecution in antiquity usually consider their own incidences of violence; contemporary policymakers rarely consult humanities scholars to integrate their understandings into policymaking. The Human-and Cyber-Infrastructures to Study and Combat Violence (HCSCV) Group hopes to bridge these disciplinary divides by viewing the study of violence as a systemic and structural force that is simultaneously historical and contemporary. In doing so, HCSCV serves as an important point of collaboration through which individuals and communities analyzing, theorizing, and grappling with instances of violence can leverage advanced information technologies, education, and community-based resources to speak to one another across disciplinary and scholarly lines. HCSCV, with aid from SEASR and the Challenge Grant-funded positions at I-CHASS, will assess the applicability and adaptation of existing high performance computing technologies. HCSCV and SEASR/ICHASS are working with the Southern Poverty Law Center, the History of Peace and Violence Committee, the cities of Los Angeles, Chicago, and New York, California State University, Los Angeles (CSULA), Queens College, New York, and the Teacher Education for the Advancement of a Multicultural Society (TEAMS).

**Humanistic Algorithms**

The University of Southern California's Institute for Multimedia Literacy (IML) has faced a material challenge for the past eight years in realizing one of its primary goals: creating a digital archive system in support of the creation of digital portfolio application. The lack of sufficient computational resources for holding large collections of multimedia resources, most notably its robust digital portfolio of media-rich student projects and faculty teaching resources, has hindered IML’s creation of a pedagogical tool for faculty and students. The Humanistic Algorithms project is a collaboration between SEASR, ICHASS, and IML to address this challenge. The project is being imagined in phases, with the first stage to serve as a prototype to be completed by early June. SEASR will use data analytics to extract information from unstructured texts (i.e., raw textual data like websites, etc.) to produce semantic information that can be used to create meta-analyses of scholarly multimedia. From these meta-analyses, Humanistic Algorithms would like to contemplate: What are the components of scholarly multimedia? What is pedagogy in a networked world? How do we collaborate, train faculty, and teach students how to read and compose scholarly multimedia? The funds associated with the Challenge Grant will allow Humanistic Algorithms the opportunity to further their technological efforts by isolating and adapting additional high performance computing technologies that will aid in the development of the digital portfolio application.
**Immersive Reading: Gettysburg Comes Alive**

Augmented Reality allows users to view real-world objects in combination with computer-generated data, augmenting the sight, or other senses of the user, to provide additional information. Focusing on enhancing the prize-winning novel *The Age of Lincoln* by Vernon Burton, *Gettysburg Comes Alive* will create a reading experience that immerses readers in three-dimensional animated battle scenes. An augmented reality version of *The Age of Lincoln*, developed by the Associate Director for Human-Computer Interaction, will illustrate the strategic topography of battles with three-dimensional, animated graphics. The methodology developed for *Immersive Reading: Gettysburg Comes Alive* has tremendous potential for humanities scholars and their students, allowing them to reveal everything from military tactics of troop movement to the influence of natural geographies on the ultimate success or failure of a campaign in an innovative and interactive environment.

**The Inscriptifact Spurlock Museum Seals Project**

Building on a long-term collaboration between the University of Illinois and the University of Southern California, I-CHASS is facilitating a cooperative venture that focuses on a collection of ancient cylinder seals currently housed at Illinois’ Spurlock Museum. Researchers needed a way for their students to present the results of their analysis of digitized cylinder seal images. Since the team of student researchers is spread between the two institutions, a system capable of allowing collaborative editing of the site was required. Rather than developing this technology anew, I-CHASS leveraged an advanced portal originally developed for the NEH-funded RiverWeb project. As a continuation and elaboration of this highly successful undergraduate research partnership, the Challenge Grant-funded Associate Director for Data Analytics and Pattern Recognition will lead a major expansion of the project to digitize an additional four collections of provenanced cylinder and stamp seals. This project achieves two ends: first, it demonstrates the utility of innovative documentation tools that transform the imaging practices for this category of artifacts, both for secure identification and for research benefits; and secondly, it serves as a model, showing how high-resolution image data of basic importance in the humanities can be documented and distributed effectively worldwide through an infrastructure of networked academic institutions and through projects that feature undergraduate research.

**Language Prescriptivism**

Language, like many patterns of social interaction, has both rules and creativity. These are natural processes subject to scientific investigation, but depending on the dominant ideology of the period, one or the other has often been considered “unnatural” and outside the realm of science. Professor Douglass Kibbee of the University of Illinois is working with I-CHASS to study in a scientific manner one of the types of linguistic behavior most often condemned as unnatural: the prescription of usage by grammarians, teachers and other self-designated experts on language. To incorporate prescriptivism into a scientific framework for the study of language, we need to understand how it works in different national traditions. Early work was undertaken in 2004 to create a prototype of a database that could be used and easily adapted by researchers separated by thousands of miles. The developed software, *Invisibase*, allowed us to change columns on the fly, over the internet, without having to know anything about programming. It also required them to confront the thorny issues of dealing with multiple character sets required by languages other than English. Since then we have continued to investigate the issues and possible solutions, most recently meeting with the SEASR and the Cyberenvironments teams in NCSA, while preparing a grant request to the Worldwide Universities Network. The funds acquired from the Challenge Grant will allow the Associate Director for Human-Computer Interaction to continue his work on this project.

**Magazines and War, 1936-1939**

Despite nearly three years of warfare and 70 years of wear, hundreds of paper artifacts published during the Spanish Civil War era (1936-1939) remain intact. Historians consider many of these surviving materials to be invaluable to the public, serving as both historical references and as pieces of art; yet
many are too rare and fragile to be handled and examined. A multi-phase, multidimensional project, *Magazines and War*, preserved, restored, catalogued, and digitized magazines housed in the University’s Rare Book and Manuscript Library and the library of the Museo Nacional Centro de Arte Reina Sofia. The project also launched an interactive website that allows museum-goers and Web users alike to browse a collection of thirty digitized Spanish Civil War magazines, page by page. The completed website was a *Web Awards Finalist* at the 11th Annual South By Southwest Interactive Conference and Festival and has been named an honoree for the 2008 Webby Awards, the leading international award recognizing excellence on the internet.

**Pathways to Humanities Participation in TeraGrid (PHPTG)**

I-CHASS is working with TeraGrid to expand its support of humanities research and scholarship. Our *Pathways to Humanities Participation in TeraGrid* initiative will advance humanities collaborative research and education with high performance computing. PHPTG, through outreach and support, will engage and enable researchers in the humanities to become users of both the TeraGrid and cyberinfrastructure resources and services. PHPTG proposes to systematically deploy, evaluate, and assess the scalability of a set of these strategies, specifically with respect to humanities communities currently underrepresented among TeraGrid users. These pathways are designed to engage new humanities users in using TeraGrid Gateways, domain-specific user-friendly environments tailored to support collaborative research and knowledge discovery. Unimpeded access to TeraGrid will allow humanities researchers and educators to re-conceptualize old problems and generate new research questions with innovative thinking, methods, and solutions and support interdisciplinary humanities academic studies, research, and education.

**Representations of Status in the British Novel, 1750-1850: Using a Large Digital Collection to Understand Gradual Change**

Literary historians have long understood that their object of study is not fully captured by the kinds of evidence they are able to cite. Rhetorical habits and literary genres change in gradual and interconnected ways. But we describe those changes, for the most part, by pointing to individual texts and authors. These isolated examples do many things well, but they notoriously tend to falsify the collective and gradual character of literary change. The large collections of digitized documents now available permit literary historians to address this problem by grappling more directly with the collective dimension of change. Two obstacles stand in the way. First, we have until recently lacked the tools to analyze large collections in sophisticated ways. The MONK project, supported by the Andrew W. Mellon Foundation, is now developing tools to make this possible. The second obstacle is methodological. Literary historians do not yet understand how to connect their objects of study to the kinds of statistical evidence that could be generated by analyzing a large collection of documents. *Representations of Status in the British Novel* attempts to address this second problem by developing generalizable, portable methods for translating questions about isolated literary examples into questions about gradual changes of idiom and diction. Just as importantly, this project will show that these strategies can usefully address questions that are already central to literary studies—questions, for instance, about the relationship between fictional genres and the social history of status. Challenge Grant funds will allow our staff to continue to develop this project.

**RiverWeb**

The twenty-first century is witnessing a blurring of the traditional divisions between the domains of learning, teaching, and research. This change has been spurred, to a large extent, by advances in information technology, and all that that term implies in hardware, software, new pedagogy, access, accessibility and distribution of data and its application. The collaborative promise of new technologies and the so-called semantic web have the potential to free information from the dark corners of archives and forgotten shelves of history and make it accessible to all citizens. The ubiquitous anytime, anywhere learning that the twenty-first century both proffers and demands implies that teachers and learners must
take a much broader approach to scholarship, teaching, and learning; new technology helps us meet that challenge.

I-CHASS has developed RiverWeb in an attempt to address the needs of undergraduate education in support of inquiry-based learning. A dynamic multimedia archive of Mississippi River history and information, RiverWeb was created to meet the challenge of integrating information technology into the classroom by providing an interactive, web-based research and learning environment that engages students and brings the humanities, arts, and social sciences to life. It is structured so that faculty can offer their students the assistance they need to identify a problem; create hypotheses; explore humanities, arts, and social science information from different sources; combine, classify, and analyze that data; work with others interactively; and present conclusions in a cogent and concise manner. These skills, which structure all intellectual inquiry, are fundamental to transforming data to knowledge and knowledge to action, forming the capstone of research. RiverWeb integrates these critical data resources into cohesive narrative stories that follow individuals and cases over time and are linked to other sources in a coherent manner. The hands-on, inquiry-based approach to teaching and learning is supported by giving students access to original documents and artifacts, enabling them to “do” research instead of simply reading about it, thereby contributing to their own sense of genuine discovery. By providing access to interesting, concise, and relevant primary materials for research projects, RiverWeb also provides a learning environment that can help prepare students to handle life in a society that is increasingly dependent on science and technology.

**Scholarly Community for the Globalization of the “Middle Ages”**

The Scholarly Community for the Globalization of the “Middle Ages” (SCGMA) Group has been collaborating with SEASR, I-CHASS, the Center for Medieval Studies at the University of Minnesota-Twin Cities, the Program in Medieval Studies at the University of Texas-Austin, and the Communications Department at the University of California-San Diego since May 2007 to develop a new interdisciplinary scholarly community for globalizing the study of the “Middle Ages” (~500-1500 C.E.) SCGMA has been actively working to create an online infrastructure to support the organization of, and research with, sources in diverse formats and languages available from multiple scholarly disciplines in order to organize large quantities of textual, visual, and aural resources. SCGMA is intended to become a multi-university, multi-nation, disaggregated yet well-coordinated organization spearheading numerous scholarly projects that will challenge the Euro-centrism associated with studying the “Middle Ages.” SCGMA needs to consider adapting existing technologies for its needs and plans to investigate the following: Can a coordinated online resource be developed for students at all levels, from all parts of the globe, already fascinated by aspects of this crucial period but still insufficiently informed about its diversity and range? How can existing databases in many languages and formats, sometimes reflecting different cultural practices, be brought into communication to serve the needs of the developing SCGMA and of students and other interested parties worldwide? This Challenge Grant funding will allow SCGMA to extend its current use of high performance technologies, resulting from its previous work with I-CHASS and SEASR to encompass a more elaborate technological model. The grant offers SCGMA the opportunity to add new technology to its growing infrastructure while simultaneously establishing long-term partnerships.

**Understanding Computational Requirements of Preservation and Reconstruction**

The size, complexity and heterogeneity of geospatial collections pose formidable challenges for the National Archives in terms of high performance data storage, access, integration, analysis and visualization. The ultimate goal of this project is to allow researchers and archivists interested in preserving data of historical significance to know at what information granularity (the degree of detail or precision contained in data) that data should be gathered in order to reconstruct the event at a later date. The ideal would be to preserve the information exactly, but CPU and storage costs might be prohibitively expensive. Our approach has been to design a simulation framework that makes use of advanced
technologies, high performance computing, and novel computer architectures to provide a platform that allows archivists and other researchers to understand the costs and trade-offs associated with the long-term preservation of electronic records. Our prototype simulation system, “Image Provenance To Learn” (IP2Learn), is designed for a class of decisions based on image inspection and has successfully been used to run simulations that improve our understanding of future archival needs.

Unicorn: Toward Enhanced Understanding of Virtual Manuscripts on the Grid
I-CHASS, in collaboration with Illinois’ Program in Medieval Studies and NCSA, has been working with the University of Sheffield’s Department of French and Humanities Research Institute, and the University of York’s Center for Medieval Studies, to digitize and study fifteenth-century manuscripts. The goal of this transatlantic collaboration is two-fold: to understand the production and consumption of books and their place in late medieval culture; and to make the manuscripts available for research and teaching as a model project on the Worldwide Universities Network (WUN) grid. I-CHASS and NCSA are developing a toolkit to enhance and complement resources developed by the EPSRC-funded Pegasus project to create a robust cyberenvironment that supports the study of virtual manuscripts and other high-resolution images. The tools and methodologies generated by the project will serve as an example interdisciplinary research agenda for collaborative digital humanities scholarship.

ValidNotion: Computer Aided Comparison of User-Contributed vs. Peer Reviewed Online Content
As electronic publishing becomes ubiquitous, Web 2.0 technologies allow expansion of user-contributed content and contribute greatly to the democratization of wikis, websites, blogs, reviews, and social networking sites. But these innovations leave unaddressed the content’s validity and the impact of user-contributed content on public discourse. Led by the Assistant Director in Modeling, I-CHASS researchers will ground the user-contributed online content with academic peer-reviewed content, focusing on the analysis of the dissemination and evolution of ideas, providing insight into how knowledge and learning are disseminated through digital media and how to evaluate the validity of that content.

Western Hemisphere Slave Project
The Western Hemisphere Slave Project will enable scholars and students from all educational levels to explore the lives of slaves across the Western Hemisphere. It is envisioned as a joint collaboration between two pre-existing digital humanities projects: The Western Hemisphere Slave Database and the Digital Library on American Slavery. The Western Hemisphere Slave Database developed from Gwendolyn Hall’s Databases for the Study of Afro-Louisiana History and Genealogy 1699–1860: Computerized Information from Original Manuscript Sources, which was released in 2000 by the Center for the Public Domain and Ibiblio.org. It relied on Hall’s technical work using Powerbase software, then dBASE for DOS and a CD writer and concentrated on slave diasporas in France, Spain, Latin America, and the United States. There have been vast changes in informatics and computer technology during the decade since the Database was completed and an explosion of primary materials that have overwhelmed the initial project. Integrating these materials across linguistic and format boundaries in an easily searchable index will be of utmost importance. The Digital Library on American Slavery will be the final phase of the Race and Slavery Petitions Project. Since 1993, the Project has maintained a database of Petition Analysis Records (PARs) for every document in the collection. PARs include a broad range of information including salutations, names of petitioners and defendants, abstracts, subjects, related documents, petition results, a total of forty-two separate variables. There is no current publication, electronic or otherwise, that includes both the names of slaves and their owners. In cooperation with University of North Carolina-Greensboro’s Jackson Library, the Project now seeks to enhance the data on African Americans and make the entire database—including information on perhaps 150,000 individuals, including 35,000 petitioners, 25,000 defendants, 80,000 slaves, and 10,000 free persons of color—readily available to the public through a searchable, web-based Digital Library on American Slavery.
I-CHASS is posed to construct a second-stage project, an intuitive website with enhanced analytical abilities to cross-reference and cross-collaborate the data generated by these two projects. By creating one open-access expandable platform, I-CHASS will allow for a flexible interface that enables scholars and students at all levels to acquire and participate in the research project. Importantly, this will create a more user-friendly and comprehensive approach to slavery in the Western Hemisphere.

**World Population Data System**

A collaboration with the University of Minnesota’s Minnesota Population Center and the University of Michigan, this project will create new organizational and technical infrastructure for the integration, preservation, and dissemination of large-scale population data resources. This *World Population Data System* (WPDS), in partnership with the national statistical agencies of 75 countries, major data archives, research centers, and genealogical organizations, will support the world’s largest population data collection, with information about billions of individuals and tens of thousands of places over the past 150 years. The project will develop a model for the sustainable expansion, maintenance, and improvement of a global data resource over multiple decades. I-CHASS will collaborate in the creation of systems, tools, and procedures for database expansion, metadata creation and management, data integration, data security, dissemination, and analysis.
# APPENDIX E: BOARD OF TRUSTEES, STAFF, ADVISORY BOARD, AND DIRECTOR’S COUNCIL

<table>
<thead>
<tr>
<th>Name</th>
<th>Employment and Professional Affiliations</th>
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<tr>
<td>Blagojevich, Rod. R.</td>
<td>Governor, Ex-Officio, Power Rogers &amp; Smith, P.C., Chicago, Attorney, December 1994-present.</td>
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<tr>
<td>Bruce, Devon C.</td>
<td>Illinois State Bar Association, Illinois Trial Lawyers Association, American Bar Association, Appellate Lawyers Association, Association of Trial Lawyers of America, Chicago Bar Association, University of Illinois College of Law, Trial Lawyers for Public Justice, Chicago Inn of Court</td>
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<tr>
<td>Carroll, Frances G.</td>
<td>Instructional Supervisor, DePaul University, School Achievement Structure, Chicago, IL. Vice President, Group 17 Education Consultants, Inc., Chicago, IL. President, Carroll Family Foundation, Chicago, IL. National Black Caucus of Special Educators, Chicago Council for Exceptional Children, Illinois Council for Exceptional Children, National Sorority of Phi Delta Kappa, Alpha Kappa Alpha Sorority, Inc. Chicago Principals and Administrators Association, Chicago Area Alliance of Black School Educators, Cook County Commission on Women's Issues, Commissioner, Director of Christian Education/General Superintendent Church School</td>
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<td>Dorris, David V.</td>
<td>Dorris Law Firm, P.C., 1999-present</td>
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<td>Eppley, Lawrence C.</td>
<td>Bell, Boyd and Lloyd LLC, Chicago, J.D., CPA; Member, Corporate Department, 1985-present</td>
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<tr>
<td>Montgomery Sr., James D.</td>
<td>Bell, Boyd and Lloyd LLC, Chicago, J.D., CPA; Member, Corporate Department, 1985-present</td>
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The Civil Justice Expense and Delay Advisory Group for the United States District Court for the Northern District of Illinois
**Name**

Schmidt, MD., Kenneth

Employment and Professional Affiliations
The Judicial Evaluation Committees for the State and Federal Courts
Corporation Counsel for the City of Chicago International Academy of Trial Lawyers
American Board of Trial Advocates Illinois Trial Lawyers Association
Chicago Bar Association Illinois State Bar Association Cook County Bar Association
Chairman, Capital Litigation Trial Bar Holy Family Medical Center, Des Plaines, IL, Senior Attending Physician, Department of Medical Imaging Section Director, Nuclear Medicine

Shah, Niranjan S.

Omega Beta Pi, Pre-Medical Scholastic Honorary St. Joseph Hospital, Chicago Rush-Presbyterian-St. Luke's Hospital
Near West Side Conservation Council, City of Chicago National Trust for Historic Preservation
University of Illinois Alumni Association University of Illinois President's Council
University of Illinois Foundation University of Illinois Chicago Foundlings Home
Chicago Medical Society The Institute of Medicine of Chicago
Chairman and Chief Executive Officer Globetrotters Engineering Corporation 1974-present

Sperling, Robert Y.

Chicago-Delhi Sister Cities Program
Goldwater Scholarship, Foundation for Excellence in Education Laboratory Schools, University of Chicago
University of Chicago's Visiting Committee on University-School Relations Economic Development Commission of Chicago
Transition Team for Governor James Edgar of Illinois
Asian American Advisory Committee of US Senator Paul Simon
Governing Board of Mt. Sinai Hospital

Vickrey, Robert F.

Winston & Strawn, Chicago
Partner, July 2002-present

American Bar Association
Illinois State Bar Association
Chicago Bar Association Miller Group Media, LaSalle, IL Vice President of Legislative Affairs and Economic Development 1968-Present

Daytime Broadcaster's Association
Illinois Valley Chamber of Commerce
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<td>Congressman Hastert's Committee</td>
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<td>Illinois Gaming Board</td>
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<td>LaSalle County Republican Central Committee</td>
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<td>Illinois Republican Party for 11th Congressional District</td>
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<tr>
<td>Asonye, Chime O.</td>
<td>Urbana-Champaign Campus Student Representative</td>
</tr>
<tr>
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<td>Generation Change, Inc</td>
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<tr>
<td>Shakeel, Faizan</td>
<td>Chicago Campus Student Representative</td>
</tr>
<tr>
<td>Doyle, Sarah M.</td>
<td>Springfield Campus Student Representative</td>
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Institute for Computing in the Humanities, Arts, and Social Science

Staff

Please consult Appendix for complete curriculum vitae of all staff.

Appleford, Simon  Project Manager, Institute for Computing in the Humanities, Arts, and Social Science; Graduate Student, Department of History, University of Illinois

Bajcsy, Peter  Associate Director for Data Analytics and Pattern Recognition, Institute for Computing in the Humanities, Arts, and Social Science.

Burton, Vernon  Director of the Institute for Computing in the Humanities, Arts, and Social Science, Professor of History, African American Studies, and Sociology; Senior Research Scientist and Associate Directory for Humanities and Social Sciences at the National Center for Supercomputing Applications (NCSA).

Craig, Alan  Associate Director for Human-Computer Interaction, Institute for Computing in the Humanities, Arts, and Social Science.

Franklin, Kevin  Executive Director of the Institute for Computing in the Humanities, Arts and Social Sciences; Senior Research Scientist at the National Center for Supercomputing Applications (NCSA).

Guiliano, Jennifer  Ph.D. Candidate, Department of History, University of Illinois; Graduate Assistant, Institute for Computing in the Humanities, Arts, and Social Science; Graduate Assistant, Department of History.

Onderdonk, James  Associate Director for Education and Outreach, Institute for Computing in the Humanities, Arts, and Social Science.

Seawell, Stephanie  Graduate Student, Department of History, University of Illinois; Graduate Assistant, Institute for Computing in the Humanities, Arts, and Social Science; Graduate Assistant, Department of History.

Yahja, Alex  Assistant Director in Modeling, Institute for Computing in the Humanities, Arts, and Social Science.
Advisory Board

Ayers, Edward  President, University of Richmond
Gibbs, Tom  Former Head of Intel Worldwide Grid Strategies
Hurley, John  Head of Grid, Boeing Co.
McCarty, Willard  Professor of Humanities Computing, Centre for Computing in the Humanities, King's College London
Reed, Daniel  Director, Scalable and Multicore Computing, Microsoft.
Rockwell, Geoffrey  Professor, Department of Philosophy, University of Alberta. Lecturer, Masters of Arts in Humanities Computing, University of Alberta. TAPoR Project Leader

Smarr, Larry  Founding director, California Institute for Telecommunications and Information Technology; Harry E. Gruber professor, Jacobs School's Department of Computer Science and Engineering, UCSD; Founding Director, National Center for Supercomputing Applications (1985) and the National Computational Science Alliance (1997).

Tabor, Tom  Founder and Former Publisher, Tabor Communications; Publisher, HPCWire, Grid Today
Unsworth, John  Dean and Professor, Graduate School of Library Information and Science, University of Illinois
Director’s Council and Affiliated Faculty

Bruce, Betram C. Professor, Curriculum and Instruction, Graduate School of Library and Information Science

Cho, Wendy Associate Professor, Department of Political Science; Senior Research Associate, National Center for Supercomputing Applications

Contractor, Noshir Professor, Department of Industrial Engineering and Management Sciences, Northwestern University

Cox, Donna Senior Research Scientist, Advanced Scientific Visualization Laboratory, National Center for Supercomputing Applications and Director, Digital Arts and Media Initiative

Downie, J. Stephen Associate Professor, Graduate School of Library and Information Science

Downing, Thom Director, National Center for Supercomputing Applications

Edelson, Max Associate Professor, Department of History, University of Illinois

Fineberg, Jonathan Gutsgell Professor, Department of Art History, University of Illinois

Fouche, Rayvon Associate Professor, Department of History and Department of African-American Studies, University of Illinois

Garnett, Guy E. Associate Professor, Department of Music and Department of Computer Science, University of Illinois

Hedeman, Anne D. Professor, Department of Art History and Program in Medieval Studies, University of Illinois

Kaufman, Paula University Librarian and Dean of Libraries, University of Illinois

Kibbee, Douglas A. Executive Coordinator, Foreign Languages and Professor of French, University of Illinois

Markley, Robert Professor, Department of English and the Unit for Criticism and Interpretive Theory, University of Illinois

Mortensen, Peter Associate Professor, Department of English, University of Illinois

O’Brien, David Associate Professor, Department of Art History, University of Illinois

Pitard, Wayne Professor, Religious Studies, University of Illinois

Poole, Marshall Scott Professor, Department of Communications, University of Illinois; Senior Research Scientist, National Center for Supercomputing Applications

Powers, Richard Swanlund Endowed Chair, Department of English, University of Illinois; Affiliate Faculty, Beckman Institute

Sandore, Beth Associate University Librarian, University Library

Sproat, Richard Professor, Department of Electrical and Computer Engineering, Psychology, and the Information Trust Institute; Professor, Beckman Institute for Advanced Science and Technology

Renear, Allen Associate Professor, Graduate School of Library and Information Science

Ross, Michael Director, Krannert Center for the Performing Arts; Chair, Seedbed Initiative, University of Illinois

Snir, Marc Director, Illinois Informatics Institute

Unsworth, John Dean, Graduate School of Library and Information Science, University of Illinois

Welge, Michael Senior Research and Development Technology Program Manager, Software Environment for the Advancement of Scholarly Research, National Center for Supercomputing Applications

Wood, Gillen Associate Professor, Department of English, University of Illinois