

SEAD: The Network for Sciences, Engineering, Arts and Design

Innovations emerging from the intersection of the sciences, engineering, arts and design are transforming our economy, culture and learning contexts. This transformation is emerging through development of products, methods and questions that are fundamentally hybrid, such as software developed for human play, hardware designed for aesthetic elegance, or the plethora of scientific and cultural information requiring new means of interpretation and expression in order to enable greater understanding of complex dynamics.

As our world undergoes rapid change, we need to generate new ways to create and engage knowledge, drawing from multiple disciplines as we seek to understand the ever-increasing complexity. Collaborators can provide insights into dilemmas that elude understanding through singular inquiry. Global economic interests are at stake: We anticipate that the industries that will come to dominate our economies in 20 years are only now undergoing invention. New forms of partnership among political, academic and civil sectors of society are required if we are to bring about needed changes intelligently and humanely. Innovation stemming from interdisciplinary creativity is a major contributor to the development of new, sustainable economies and harmonious, cooperating societies.

The (U.S.) National Science Foundation (NSF) Computer and Information Science and Engineering (CISE) Information & Intelligent Systems (IIS) program sponsored five workshops in 2010–2011, bringing together artists and scientists from across the United States to address the needs of the burgeoning community of groups and individuals engaged in transdisciplinary practice. This effort resulted in the genesis of Sciences, Engineering, Arts and Design (SEAD), a new network focusing on advocacy and dissemination of innovative methods for connecting and supporting a distributed community across academia, nonprofit organizations, civil society, industry and funding entities. The network facilitates research community development; collaboration and project matchmaking; expertise referrals; large-scale collaborative teaching; forums to share best practices in lifelong learning; and philanthropic opportunities for funding organizations. The growing interdisciplinary community continues to face challenges in its efforts to self-organize in the face of constraints imposed by academic systems and historical biases; we continue to seek a dynamic and synergizing research and outreach exchange. We recognize an urgent need for a paradigm shift that can overcome such biases and fully address, in an integrated manner, the documentation needs of the science-art community. To this end, a partner group, XSEAD, is developing a 21st-century portal to provide a community platform offering a centralized view of this emergent field; rapid dissemination of multimodal research outcomes; extensive databases of prior and current research; an informed record of science-art curricula; support for structures for science-art careers; and evidence of societal impact of interdisciplinary integration.

The network addresses fundamental challenges, including the need to align academic pedagogies with 21st-century thinking skills; to promote diversity of perspectives, approaches and people in the creative economy; and to identify best practices that create critical thinkers and leaders for the ever-changing job market. We are providing a platform to generate and disseminate public dialogue about the intellectual, cultural and economic potential of creative intersections of art, science and technology.

edited by William J. Mitchell, Alan S. Inouye and Marjory S. Blumenthal, Committee on Information Technology and Creativity, National Research Council. White papers will be published online at <seadnetwork.wordpress.com>, and some will be presented at selected conferences.

The White Papers group is also collecting a bibliography of SEAD-related, third-party reports, to be combined with suggested actions from these White Papers, to gain a meta-view of community needs that will inform future SEAD initiatives.

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Vicki Sowry, Program Manager, Australian Network for Art and Technology (ANAT)

Nicola Triscott, Founder and Director, The Arts Catalyst, United Kingdom; Founder, Project Director, Catalyst Rwanda

Annie Wan, Independent Artist, China

Working Group on Learning, Innovation, and Cultural Development

A growing body of research indicates that the ability to innovate will determine a nation's success in today's rapidly changing global economy. In order for countries to remain competitive, today's workforce and learners of all ages will benefit from innovation thinking skills. Leaders must integrate innovation thinking into learning models and career descriptions in all sectors. Innovative thinking is fundamental to the intersection of the sciences, arts, engineering and design. Thus, researching, developing, evaluating and disseminating pedagogies, strategies, technologies and partnerships to cultivate the inspiring intersections of SEAD will help drive our innovation economy.

Innovation involves articulating the impact of transdisciplinary engagement on culture and economic development. There is potential to build a brand with credibility and trust; to identify unique opportunities that merit community support; and to develop "incubator" programs with toolkits and strategies for team building. This can result in workforce development and new models for intellectual property policy and technology transfer. Designed to be accessible to the general public, network activities can foster recognition in the form of awards and challenge projects and can facilitate affinity building in communities. Target support groups consist of academic policy makers and community leaders joining together to nurture and mentor the next generation.

Areas of focus on learning also include rethinking the distinction between art and science in formal and informal arenas; designing models for integration of STEAM [2] curriculum; developing and sharing best practices; and involvement in organizational conferences. Others include attending congressional hearings within the Department of Education to address policies and forging partnerships between universities and community hacker spaces.

Coordinator: Lucinda Presley, Executive Director, Institute where Creativity Empowers Education

Co-Chairs

Pamela Jennings

Katherine Moriwaki, Assistant Professor of Media Design, School of Art, Media and Technology, Parsons, the New School for Design.

Brian K. Smith, Dean, Continuing Education, Rhode Island School of Design

Assistance

Sheldon Brown, Professor of Visual Arts; Director, Arthur C. Clarke Center for Human Imagination, University of California, San Diego

Alicia Gibb, Research and Development Lab Director, BugLabs, New York

Tracy Hammond, Director, Sketch Recognition Lab; Associate Professor, Department of Computer Science and Engineering, Texas A&M University

Partner Enrollment and Advocacy in Agencies

This objective will serve the goal of identifying partners for the network. There is potential to broker collaborations among members and institutions. This group would become the voice of the network by facilitating and explaining the value of partnerships across communities and disciplines.

Chair: Gunalan Nadarajan

SEAD Curatorial Working Group

To create crossover linkages among the two separately funded NSF groups NSEAD and XSEAD, three participants will serve on the XSEAD Curatorial Board. This partnership seeks to develop curated sets of high-quality examples of integrative works. Each set will build visual explanations of works representing a perspective on the history and prospects of the field. In developing this content, Sheldon Brown represents a major academic research facility, Alicia Gibb represents the “DIY and Maker” community, while Pamela Jennings will contribute a new multimedia representation of the previously curated exhibition “Speculative Data and the Creative Imaginary: shared visions between art and technology.” All three will join a network of distinguished organizations and community leaders working with XSEAD PIs Thanassis Rikakis and Donna Cox as well as the XSEAD portal development team on this objective.

Chair: Sheldon Brown, Professor of Visual Arts; Director, Arthur C. Clarke Center for Human Imagination; Founder, New Media Arts for the California Institute of Telecommunications and Information Technologies (CalIt2); University of California, San Diego

Co-Chairs: Alicia Gibb, Pamela Jennings

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References and Notes

1. See Fox D. Harrell and Sneha Veeragoudar Harrell, “Strategies for Arts + Science + Technology Research: Executive Report on a Joint Meeting of the National Science Foundation and the National Endowment for the Arts,” 7 April 2011, National Science Foundation Computer & Information Systems & Engineering Division of Information & Intelligent Systems, <<http://cms.mit.edu/news/Harrell-NSF-NEA-Workshop-ExecutiveReportFinalDraft.pdf>>.

2. STEM is an acronym used to refer to the disciplines of Science, Technology, Engineering and Math. Many now advocate for adding an A to the acronym to form STEAM (Science, Technology, Engineering, Art and Math). STEAM represents innovation that comes from integrating art and design with STEM fields, humanizing technology and translating its potentials in ways that are capable of bringing about societal change.