Human Sciences & Technologies Advanced Research Institute

STANFORD UNIVERSITY

H-STAR Annual Report
September 1, 2017 – August 31, 2018

CONTENTS

1. Overview and Mission

What: H-STAR is a Stanford interdisciplinary research institute reporting to the Dean of the Graduate School of Education.

Focus: H-STAR focuses on advancing the human sciences, often in the context of their application to the design and uses of information technology and their influences on people, with a particular emphasis on education and learning. H-STAR programs conduct research at the intersection of human sciences and information technology in the areas of learning, mobility, collaboration, entertainment and commerce.

Breadth: H-STAR is the only organizational unit on campus focusing on the multi-disciplinary core of theory, research, and methods that are needed for world-class work on the central topics in K-12 learning sciences and technology design.

Sponsored research: During the twelve-month period of this report, H-STAR provided all administrative and financial management and support for 9 sponsored research projects (8 of them in the Graduate School of Education), with a total budget of $7,896,305 (Section 4.)

Core AC faculty: Five Academic Council faculty have research activities supported in a substantial way by H-STAR, three of them in the Graduate School of Education. (See list in Section 5a.)

Other researchers (not Academic Council): A further 10 Stanford and Stanford-associated faculty and researchers without Academic Council status have a significant affiliation with H-STAR. Several of them have received funding through H-STAR (often through our mediaX Industry Affiliates Program). (Section 5c.)

Campus need met: Most of the faculty supported by H-STAR (listed in Section 5) are based in social science and humanities-affiliated departments (rather than engineering and research-equipment intensive disciplines such as physics). Those disciplines typically do not have the extensive infrastructure needed to support the large-scale interdisciplinary research projects they wish to pursue. As a result, H-STAR meets an important campus need that would otherwise go unfilled.

U/G education: While the primary mission of H-STAR is university research, H-STAR affiliated faculty members are among campus leaders in undergraduate education.

H-STAR membership criteria: Having a broad scope of interest that has commonalities with every School, H-STAR is defined by research mission rather than permanent faculty affiliation; we facilitate, fund, and support research within our mission anywhere on the campus. All Stanford faculty are potentially H-STAR researchers. To date, over 80 Stanford researchers from all five schools have carried out H-STAR supported research or hosted a visiting H-STAR researcher from another university. (See lists in section 5 for current and past affiliated faculty.) In addition, over 100 Stanford faculty have received over $5M in research support through H-STAR's mediaX Industry Partners Program. (See Section 7.)

Activities: We pursue our mission in a number of ways: we organize and service interdisciplinary grants, contacts, and other funding opportunities; we bring together faculty to work collaboratively on projects — both across the campus and in collaboration with faculty at other universities around the world; and we organize events such as lectures, small seminars, workshops and conferences, sometimes through our mediaX program.

Support of faculty collaboration: We provide full service support (visa procurement, travel, logistics, housing, schools for children, space, etc.) to Stanford faculty who want to invite a collaborator from an overseas university. During the period 2017-18, we arranged visits of 8 foreign researchers who came to Stanford to work with Stanford faculty. (Itemized in Section 6.)

Staff: H-STAR employs 6 academic staff, 11 regular staff, and 1 postdoctoral scholar, who perform shared administrative support functions, such as research administration, financial, human resources, and building management in Ventura Hall. We also currently have 2 temporary employees. In addition, between September 2017 and August 2018, we supported 1 graduate student as part-time academic staff and 1 graduate student as a research assistant.

Budget (research): The total volume for federal and non-federal sponsored research funding awarded to H-STAR in FY18 was $225,000, of which $63,127 was F&A (indirect cost charges). See Section 4 for a complete listing of all sponsored projects.

Budget (administration): The FY18 total administrative costs for H-STAR were approximately $407K.

Funding sources: The primary source of funding for H-STAR research is the normal system of federal and foundation grants. The infrastructure costs (primarily support-staff salaries) required to support the institute's research and outreach activities and to ensure compliance are

approximately $407K. 41% of these infrastructure costs were covered through participation in sponsored projects and revenue-generating activities.

2. How H-STAR works

Faculty support: H-STAR provides affiliated faculty (and their students and research assistants) and visiting researchers with limited-term office space, physical and "virtual" meeting rooms (via IP videoconferencing), lecture rooms, lab space, seminars and lectures, printing and copying facilities, secretarial services, the services of administrative, financial and technical support personnel, assistance with identifying and securing funding for research, and, through the mediaX program, contacts with industries relevant to their research pursuits.

Regular research funding: The primary means for funding H-STAR research is external grants, secured by the faculty and affiliated researchers. The administrative and financial support staff of H-STAR provides help and support for faculty in proposal preparation and grant management. During the period covered by this report, H-STAR managed 9 sponsored faculty projects, totaling $7.9M. These are itemized in Section 4.

Major research projects: H-STAR also works with faculty to secure large-scale, institute-level, sponsored research funding for multi-year projects involving many faculty members. During the period covered by this report, we managed one such project we had helped initiate, totaling $3.3M in funding:
- USAID, $3,256,518: Resilience Africa Network (RAN) (11/08/12 – 09/30/17), PI James Fishkin (Communication)

Space: H-STAR has administrative offices and research space in Ventura Hall, which comprises 8 administrative offices, 2 rooms used as administrative offices and shared labs, 1 research lab, and 1 large room devoted to international research projects.

3. Major research programs within H-STAR during 2017-18

3a. *USAID RAN Project.* The Resilient Africa Network (RAN), funded by USAID, is a partnership of 20 African universities in 16 countries. RAN seeks to strengthen the resilience of communities by nurturing and scaling innovations from the different universities. The RAN Project, funded at $3,256,518 over five years, applies science and technology to strengthen the resilience of African communities against natural and man-made stresses. It is led by Makerere University with Tulane University's Disaster Resilience Leadership Academy, Stanford University's H-STAR Institute, and the Center for Strategic and International Studies (CSIS) as partners. RAN is one of seven development labs under the Higher Education Solutions Network (HESN) in the Office of Science and Technology (OST), USAID. H-STAR is developing online democracy tools and a form of online education (involving MOOC-like elements) to support the RAN initiative.

3b. *ChangeLabs* is a program in H-STAR directed by Banny Banerjee. Stanford ChangeLabs has been pioneering world-class thinking on innovation methodology aimed at complex, scaled, and multi-outcome challenges such as global food security and climate change. The "System Acupuncture" Innovation methodology is based on an underlying theory that combines systems thinking, resilience theory, behavior change theory, organization change, business innovation, and design thinking. Institutions such as the World Economic Forum and the United Nations are already adopting this methodology. ChangeLabs is involved in conducting trans-disciplinary research, and teaching classes at the d.school integrating rubrics across disciplinary

boundaries.

Through the Collaborating with the Future: Transforming Large-scale Systems class that ChangeLabs teaches at the d.school, students worked with project organizations (The Nature Conservancy, Mastercard, and UNDP) on real challenges affecting regions such as Egypt, Pakistan, Latin America, and Africa. This class also provides insight into how to educate and build expertise in the emerging field of systems innovation. Responding to increasing demand for learning about systems approaches, ChangeLabs launched a series of open enrollment workshops designed to introduce key concepts around systems innovation and leadership. The events attracted attendees from regions around the world including Africa, Scandinavia, Latin America, Oceania and Northern America. Changelabs's work facilitating the Future of Innovation Summit over the past couple of years led to the adoption of an ambitious new strategic direction for the UNDP focusing on supporting innovation across its constituent nations. ChangeLabs's work on systems innovation for the Sustainable Development Goals (SDGs) led to the Administrator of the UNDP, Achim Steiner, to invite Banny Banerjee to a small gathering with luminaries from different fields to discuss issues that affect the future of people and the planet. Banny Banerjee is now also an advisor to the global platforms project driven by UNDP. ChangeLabs has also been working on refreshing a year-long program of events, called the System Transformation Nexus, to engage affiliates members on leveraging systems approaches in their organizations and contributing to a global network of system innovation leaders.

SAMPLE LIST OF 2018 STANFORD CHANGELABS ACTIVITIES

MEETING	GROUP	LOCATION
Collaborating with the Future Student Class	d.school	Stanford
Design Thinking and Systems Thinking Workshop	Asia Society	Stanford
Design Thinking and Systems Thinking Workshop	Dimension Data	Stanford
Systems Innovation Workshop	Leadership Garage	Stanford
Collider Event	Omidyar Group	California
Systems Innovation Workshop	The Nature Conservancy	Stanford
International Conference on Energy and Sustainability 2018	Seoul University	Seoul, South Korea
Women Leaders in Global Health	Gates Foundation	Seattle
Fuller Symposium	The World Wildlife Fund	Washington DC
The Future of Development	UNDP	New York
Systems Acupuncture Class	Open enrollment	Stanford
Design for Scale Class	Open enrollment	Stanford
Mastering Systems Leadership Class	Open enrollment	Stanford
Reflections on Teaching: Games as Systems of Learning	Harvard University	Boston
Sustainable Development Goals Global Leadership Round-Table	UNDP	New York
UNDP Leadership Forum	UNDP	New York
Plenary Address: "New Frontiers in Innovation Theory"	Danish Design Council	Copenhagen, Denmark

3c. *mediaX.* H-STAR's primary industry partnership program, mediaX, is a self-funded program that seeds campus-wide research and coordinates industry interest. The program currently includes 33 industry members. The program supports and funds research initiatives on domains involving people and technology, rather than by discipline. Since the program began in 2001, mediaX has supported more than $5M of Stanford research, spread across over 115 Stanford faculty PIs, receiving over 240 proposals, representing faculty from all seven schools, and involving over 130 graduate students. *Over three-quarters of research proposals received and*

over half of the awarded projects have included topics related to learning and education. To inspire novel research and foster cross-disciplinary collaborations, mediaX offers seminars, workshops, conferences, roundtables, and forums on horizon topics with significant potential to generate industry-university conversations about novel research questions.

Research funding from mediaX has been in the form of seed grants to support early investigation of promising ideas that show likelihood of leading to larger projects. mediaX research funds are open to all researchers in the Stanford community, and preference is given to novel interdisciplinary collaborations. Many of these "seed" funded projects leverage large federal and foundation grants (bringing faculty and student work closer to societal impact through commercial diffusion). A significant number have led to new interdisciplinary proposals for federal and foundation grants that build on the mediaX seed projects. (See Section 7 for more details about mediaX.)

4. H-STAR managed funded research projects

The total funding amount for projects active in the period September 2017 – August 2018 is $7,896,305.

4a. Projects that have a budget over $1M

Three projects, total funding amount $6,027,064

1. Daniel Schwartz: US Department of Education (07/01/14 – 06/18/18) $1,367,916. Title: Designing Contrasting Cases for Inductive Learning
2. Daniel Schwartz: Moore Foundation (07/14/15 – 07/13/18) $1,402,630. Title: Improving and Assessing Learners' Preparation for Future Learning in Science
3. James Fishkin: USAID / Makerere University (11/08/12 – 09/30/17) $3,256,518. Title: African Resilience Initiative

4b. Project with a budget of $1M or less

Six projects, total funding amount $1,869,241.

1. Daniel Schwartz: NSF (09/15/16 – 08/31/19) $650,190. DD: C2STEM: Learning by Modeling: A Collaborative and Synergistic Approach to K-12 Computing and STEM Education
2. Daniel Schwartz: NASA (01/04/16 – 01/03/21) $756,479. Real World, Real Science: Using NASA Data to Explore Weather and Climate
3. Daniel Schwartz: Heising-Simons Foundation (03/01/18 – 06/30/18) $25,000. 2018 Cubberley Lecture with Jill Biden
4. Daniel Schwartz: Moore Foundation / University of Colorado, Boulder (07/17/15 – 10/31/18) $200,000. Pioneering Next Generation Assessments of Science Learning
5. Brigid Barron: Cooney Center (05/01/17 – 04/30/18) $37,572. FamLAB Innovation Lab
6. Roy Pea: Guangzhou Qitian Science & Technology Co., Ltd. (04/01/18 – 12/15/18) $200,000. Special Instruction in High Priority Sectors with Collaborative Research and Information Exchange

5. Faculty and researchers supported by H-STAR

5a. *Faculty supported substantially by H-STAR*

The following 5 Academic Council faculty carry out research activities supported in a substantial way by H-STAR:

1. Barron, Brigid (Graduate School of Education)
2. Fishkin, James (Department of Communication)
3. Hamilton, Jay (Department of Communication)
4. Pea, Roy (Graduate School of Education)
5. Schwartz, Daniel (Graduate School of Education)

5b. *Affiliated Stanford Faculty*

The following 69 additional, current or past Academic Council faculty have or have had some research projects within H-STAR or participate(d) actively in one or more H-STAR programs. Those that have received research funding from H-STAR (often through the mediaX program) are marked with an asterisk.

1. Altman, Russ (School of Medicine)
2. Agrawala, Maneesh (Computer Science)*
3. Bailenson, Jeremy (Communication)*
4. Bailey, Diana (Management Science and Engineering)
5. Barron, Brigid (Graduate School of Education)*
6. Berman, Russell (Comparative Literature)
7. Bernstein, Michael (Computer Science)*
8. Blikstein, Paulo (Graduate School of Education)*
9. Boaler, Jo (Graduate School of Education)*
10. Brown, Bryan (Graduate School of Education)*
11. Chafe, Chris (CCMRA)*
12. Chu, Larry (School of Medicine)
13. Clark, Herbert (Psychology)
14. Cohen, Geoffrey (Graduate School of Education)*
15. Cook, Karen (Sociology)
16. Cutkosky, Mark (Mechanical Engineering)
17. Das, Rhiju (Biochemistry)*
18. Dee, Thomas (Graduate School of Education)*
19. Diaconis, Persi (Mathematics)
20. Dweck, Carol (Psychology)*
21. El Gamal, Abbas (Electrical Engineering)
22. Eshel, Amir (Comparative Literature)*
23. Fischer, Martin (Civil and Environmental Engineering)*
24. Genesereth, Michael (Computer Science)
25. Guibas, Leonidas (Computer Science)
26. Hakuta, Kenji (Graduate School of Education)*
27. Hanrahan, Pat (Computer Science)
28. Heer, Jeffrey (Computer Science)*
29. Heller, Craig (Biology)
30. Hinds, Pamela (Management Science and Engineering)*
31. Iyengar, Shanto (Communication)
32. Jenkins, Nicholas (English)*
33. Johari, Ramesh (Management Science and Engineering)*
34. King, Abby (Health Research and Policy)*
35. Klemmer, Scott (Computer Science)*
36. Koltun, Vladen (Computer Science)
37. Krawinkler, Helmut (School of Engineering)
38. Laughlin, Robert (Physics)*
39. Law, Kincho H. (Civil and Environmental Engineering)*
40. Leifer, Larry (Mechanical Engineering)*
41. Levis, Philip (Computer Science)
42. Levoy, Marc (Computer Science)

43. Lewenstein, Marion (Communication)
44. Luhrman, Tanya (Anthropology)
45. Lunsford, Andrea (English)
46. Michelli, Fiorenza (Biology)*
47. Musen, Mark (School of Medicine)
48. Nass, Clifford (Communication)*
49. Ng, Andrew (Computer Science)
50. Okamura, Allison (Mechanical Engineering)*
51. Pea, Roy (Graduate School of Education)*
52. Perry, John (Philosophy)
53. Reeves, Byron (Communication)*
54. Reiss, Allan (Psychiatry)*
55. Riedel-Kruse, Ingmar (Bioengineering)*
56. Saggar, Manish (Psychiatry and Behavioral Sciences)*
57. Salisbury, Kenneth (Computer Science and Surgery)
58. Schnapp, Jeffrey T. (Stanford Humanities Laboratory)
59. Sweeney, James (Management Science and Engineering)*
60. Sheppard, Sheri (Engineering)
61. Srivastava, Sakti (Surgery)*
62. Turner, Fred (Communication)*
63. Valentine, Melissa (Management Science and Engineering)*
64. Wagner, Anthony (Psychology)
65. Wandell, Brian (Psychology)
66. Wheeler, Christian (Graduate School of Business)
67. Willinsky, John (Graduate School of Education)*
68. Wineburg, Sam (Graduate School of Education)*
69. Winograd, Terry (Computer Science)

5c. *Stanford researchers in H-STAR*

The following 10 researchers (all senior scholars with doctoral degrees) have a significant affiliation with H-STAR:

1. Bannerjee, Banny (H-STAR)
2. Devlin, Keith (H-STAR, CSLI)
3. Flora, June (H-STAR)
4. Fogg, B.J. (H-STAR)
5. Fruchter, Renate (Engineering)
6. Horn, Robert (Computer Science and H-STAR)
7. Ju, Wendy (Mechanical Engineering)
8. Russell, Martha (mediaX)
9. Sirkin, David (Mechanical Engineering)
10. Winter, Sandra (Medicine)

6. International research collaborations

H-STAR has several international collaborations with universities and industries throughout Europe and Asia. The most active during the period 2017–18 are listed below:

6a. *Finland* H-STAR has had close ties with Finnish universities for several years, focused on research on education and the human-centered design of technology, each areas where both Finland and Stanford have international reputations. For many years, the Finnish government technology agency (TEKES) funded Stanford's infrastructure costs in supporting research

collaborations on the Stanford campus between university scholars from Finnish universities, working on projects with Stanford faculty PIs. A change in TEKES' national funding priorities led to non-renewal of the program, apart from funding ad hoc visits from Finnish university researchers. In 2017, we began negotiations with TEKES to re-establish some form of continuation. In the spring of 2019, TEKES will convene a meeting of all Finnish alumni of the H-STAR Visiting Scholars program.

In December 2017, Keith Devlin visited the University of Lapland to give a keynote at a conference and the University of Helsinki to give a seminar talk.

Much of the 2018 period was spent planning a large three-party research initiative between The University of Helsinki, Beijing Normal University, and H-STAR, to study the effective use of AI, Machine Learning, and Big Data in education. It was decided to organize three two-day workshops to conduct the detailed planning. The first, at Stanford, was organized and hosted by H-STAR in October 2018, the second will be in Helsinki in February 2019, and the third in Beijing later in 2019. The goal of the three workshops is to formulate a multi-year research plan for a large-scale project funded by the three collaborating nations.

6b. *Japan* H-STAR has had a number of partnerships with Japanese research entities going back over many years. (One such formed the impetus and much of the original funding for the launch of mediaX.) The year 2017-18 saw the second continuation of the partnership initiated two years before with NHK, the large Japanese government-funded electronic media company. With academic leadership provided by Prof Jay Hamilton in the Communications Department, this H-STAR program organized and hosted visits from five media researchers, who each spent two months at Stanford, spread throughout the year. The focus was on identifying emerging trends in the world of media. The NHK visitors interacted with a variety of different Stanford faculty and researchers. They are listed below:

1. Daisuke Takemura, Sep 4–Nov 2, 2017
2. Marie Katsura, Sep 4–Nov 2, 2017
3. Yuki Umehara, Feb 1–Mar 31, 2018
4. Ichiro Tagami, Apr 1–May 31
5. Hironori Furumiya, Apr 1–May 31

6c. *Germany* H-STAR has supported a number of Stanford research collaborations with German academics. In 2017-18, we hosted two scholars from Germany. One, Prof. Sabine Remdisch, came from the Institute for Performance Management at Leuphana University of Lüneburg, hosted by Prof Larry Leifer in the School of Engineering, from September 11, 2017 to March 11, 2018. The second, Prof. Thorsten Quandt, from the Department of Communication at the University of Münster, came from May 1 to July 16, 2018, to work with Prof. Jeremy Bailenson in the Department of Communication.

6c. *Estonia* H-STAR has a research partnership with Tallinn University of Technology in Estonia for several years, during which period a number of Estonian academics have spent time here working with Stanford faculty. During 2016-17, we established a similar partnership with Tartu University. The first visiting scholar from Tartu, Prof. Margus Pedaste of the Institute of Education, came from January 8 to July 7, 2018, hosted by Prof. Brigid Barron of the Graduate School of Education.

7. mediaX Industry Partners Program

mediaX is an industry affiliate program of the H-STAR Institute. It acts as a forum, an incubator of ideas, and a programmatic framework to support multi-disciplinary relationships. mediaX initiatives explore how a better understanding of people can improve the design of technologies

and services, particularly in education and learning, but also with relevance for entertainment and commerce.

mediaX programs explore issues at the intersection of human sciences and information technologies, in which media – broadly conceived – is a key consideration. They connect faculty and graduate students in the Graduate School of Education, across Stanford University and in the mediaX member community – on issues, questions, methods and insights that include both people and IT.

Overall summary mediaX 2017-2018
- 33 Members
- $1.5M Membership Fees
- 5 Research Projects funded
- $260K to Faculty in Research Grants
- 12 Member Theme Days
- 7 Member Workshops (23 days)
- 5 Day-long Multi-member Conferences
- 17 GSE-affiliated researchers presented insights at mediaX events
- 36 Stanford faculty & 34 Stanford-affiliated researchers participated in mediaX activities
- 66 Outreach Presentations / Local and International Visits
- 37 Seminars
- 1 Conference paper
- 5 Research Summary Reports
- 78 one-page Research Briefs

7a. GSE impact

Aside from the direct impact of funding/supporting GSE researchers, a large part of the mediaX impact can be seen on and off campus and in the dialogues created between GSE researchers and researchers working on education-related topics in other schools/departments. Our various events – theme days, conferences, and research themes promote conversations, information sharing, learning and cross-pollination of ideas – among scholars and across departments in the colleges at Stanford University: GSE, H&S, CoE, Med, Law, GBS. They highlight research and contributions in settings and contexts inside the GSE and across Stanford. They also connect the GSE with innovative research from other departments, colleges and industry, that advances education and learning, serving to foster a vibrant interdisciplinary network. (See descriptions of grants to GSE faculty, presentations by GSE faculty, and participation of GSE-affiliated researchers below.)

7b. Memberships

mediaX is supported entirely by its external members. In 2017-2018, the program received $1.5M from its member organizations.

mediaX members include a global portfolio of multinational corporations, local companies, organizations that serve business clients (such as consortia, university executive programs, etc.), and selected startups with synergistic interests. 7 Affiliate, 21 Associate, 3 Institutional, and 4 Strategic Members comprise the external constituency and sponsorship of mediaX at Stanford University.
(* indicates Continuing)

Affiliate Members:
*AiTaiJi
*Sábia Experience
*Hong Kong Productivity
Council
Japanese Science &
Technology Agency
*Monty Toole Family
Foundation
Prefixa
Yixue Education

Associate Members:
Acario Innovation
*AISIN AW
Catalia Health
Facebook
Fujitsu

Associate Members (cont):
Genentech
*Huawei
*ITRI
IVOW
*Japan-NET
*Konica Minolta
Midea
Mosaic
NASPERS
*Nissan
*Omron
QiTian
*SESI/CNI
The Warehouse Group
*Vobile
Yindu Ogilvy

Institutional Members:
CUHK
*IBE/FGE
*HKUST

Strategic Members:
*Prudential
SEST/SENAT of CNT
*VBP Orange
* THNK

7c. mediaX research themes

mediaX Research Themes enable researchers from member companies to collaborate with Stanford researchers on leading-edge questions, which have a time horizon of three to seven years and often revolve around complex issues that are not yet well defined. Results of mediaX research projects are disseminated openly. In many cases, results validate a new question or method. They can also lead to significant research funding from public or private resources.

Research funds are awarded by mediaX as university research grants, following review by a faculty committee. They are intended as catalyst funds – to seed the trial of new collaborations, new questions, and new methods.

Results of previous mediaX-funded projects have provided insights which informed continuing conversations between Stanford thought leaders and mediaX member delegates. Current mediaX research themes address the broad contexts of education and learning.

In 2017-2018 mediaX funded graduate students and their research through $260,000 awarded to five research awards on the theme of "Potential, Productivity and Performance." These funds were used primarily to support graduate students. (See below for more information.)

mediaX research grants serve as catalysts for novel research initiatives. Funding is modest and time frames are generally short. In many cases continued research by the project teams is necessary to carry the research to an academically reportable conclusion. In order to provide mediaX members with a summary of progress on the research questions, mediaX works with the Stanford researchers to provide updates of progress and brief summaries of findings.

Written updates on completed projects for "Potential, Performance and Productivity":

Using Mobile Technology to Bring Social Psychological Interventions to the Workplace
PI: Geoffrey Cohen, Psychiatry and Graduate School of Education
This project will develop, refine, and test a mobile application (app) that delivers psychological interventions aimed at bolstering worker motivation and performance at moments of distress.

New Training Models for the Digital Workforce: The Case of Coding Bootcamps
PI: Melissa Valentine, Management Science and Engineering
This study will examine the process and outcome of a boot camp model of
professional training.

**Where are the Breakdowns? Surveying Successful and Failed Uses of Data
Analytics Across the Organization.**
PI: Pamela Hinds, Management Science and Engineering
This field study employed qualitative research methods to illuminate the process and
practices through which individuals from diverse professional backgrounds enact data
analytics, and it provided essential insights into the conditions of successful and failed
uses of data analytics for managerial decisions.

Vitae: Digital Hiring Halls for On Demand Workers
PI: Michael Bernstein, Computer Science
Co-I: Margaret Levi, Political Science
This project designed and evaluated a socio-technical system in which groups of
workers can bind together into a community and trade on their collective reputation.

Coordinating Expert Flash Teams on the Biological Internet of Things
PI: Ingmar Riedel Kruse, Bioengineering
Co-PI: Michael Bernstein, Computer Science
This project investigated how a team of distributed scientists ("Knowledge workers")
working with distributed instruments ("Internet of Things") can be successfully
coordinated and motivated to collaborate on complex and open-ended research
projects.

Online Research Briefs of mediaX-sponsored Research Projects
To widely disseminate the findings and insights from mediaX-funded research projects,
mediaX has recently created one-page online summaries for 78 of its funded projects in 15
of its research themes. These are available on the mediaX website.

7d. Visiting scholars and researchers
Visiting scholars from mediaX member organizations spend time at Stanford hosted
by a Stanford professor; during this period they pursue scholarly work, contribute to
mediaX activities, and immerse themselves in the Stanford culture of discovery.

- Elizabeth Arredondo, Catalia Health, Conversations of Automated Agents, Hosted by
  Professor Jeff Hancock
- Jianming Dong, Huawei, User Interface Research, Hosted by Professor Larry Leifer,
  Mechanical Engineering
- Yuki Higuchi, Konica Minolta, Haptics, Hosted by Professor Allison Okamura, Mechanical
  Engineering
- Kiyoshi Sakamoto, Konica Minolta, Smart Office Systems, Hosted by Assistant Professor
  Michael Bernstein, Computer Science
- Daisuke Takahashi, Konica Minolta, Design Research, Hosted by Professor Larry Leifer,
  Mechanical Engineering
- Erin Young, Oxford University, Interdisciplinary Research & Education, Hosted by Professor
  Roy Pea, Graduate School of Education

7e. Conferences
mediaX-hosted conferences provide opportunities to identify areas of expertise that can
illuminate new areas of inquiry and discovery. A mix of academic and industry
perspectives, covering discrete elements of complex issues, provides business and
academic attendees opportunities to integrate concepts across existing fields of knowledge
and imagine new connections. mediaX-hosted conferences are open to members, non-

members, faculty and students. They acquaint prospective members with the mediaX/HSTAR mission and promote relevant research by faculty in the Graduate School of Education and other Stanford units.

Sept 2017
ICDSC Conference
Hosted by mediaX in conjunction with member organization Prefixa, the 11th edition of the conference discussed recent advances and open issues in smart camera networks. mediaX hosted the 2nd ICDSC Conference in 2008. Smart camera networks are becoming a fundamental piece of our intelligent cities, buildings and homes, progressively inserting themselves into our lives. From smart surveillance systems composed of a multitude of smart camera nodes to small wearable cameras able to render a visual log of our daily experience, these devices interact with each other and with a wealth of other smart things, and of course, the internet. Their rapid development is possible thanks to the convergence of several technologies.

Oct 2017
Workforce & Learning Pathways In A Period Of Dynamic Change Conference
The "Workforce & Learning Pathways in a Period of Dynamic Change" Conference took place on October 6th, 2017 at Stanford University. With the forces for education and employment shifting, changes made today will, in all likelihood, take several years to show impact. The need for change is urgent, and creative leadership is a necessity. With this in mind, Thought Leaders from the mediaX community came together to discuss: Poverty, Mobility and Displacement in the U.S., Global Economic, Social and Political Impact, System Experiments for a Competitive Workforce, Perspectives on the Opportunities, Market-Shaping Forces and Responses, Financing the Transformation, Experiments with Extensible Insights, Experiments with Promising ROI, and Pathways for Mobility.

Nov 2017
Human AI Collaboration: A Dynamic Frontier Conference
The "Human AI Collaboration: A Dynamic Frontier" Conference took place on November 1st in the Mackenzie Room at Stanford University. In the best of circumstances, collaboration and teamwork present challenges. Even teams of highly competent people struggle to clarify goals, understand each other in conversations, define roles and responsibilities, and adapt when necessary. Determining what we want from collaboration is sometimes the hardest task. Establishing confidence and trust in team members can make or break a project, and this is equally true of the relationships we have with our digital assistants and AI collaborators. The expanding capabilities and applications of intelligent machines call for a more sophisticated understanding of the relationships between people and AI.
Innovation Ecosystems for AI-Based Education, Training and Learning
The "Innovation Ecosystems for AI-Based Education, Training and Learning" Symposium took place at Stanford University on November 13, 2018 in the Bechtel Conference Center. Thought Leaders from across the mediaX community came together to examine how artificially intelligent capabilities are being introduced into teaching and learning products and services. Relying on peer-to-peer linkages and horizontal relationships, the collective action of independent actors using AI is reshaping education, training and learning. The mindsets, organizational constructs and technological systems of multi-sided markets, platforms and ecosystems offer opportunities to reframe how we think about product development and service delivery for education and training, including certification, credentialing and accreditation.

Feb 2018
<u>Digital Cities Summit</u>
For the second time, mediaX at Stanford University co-sponsored the Digital Cities Summit with the Global Project Center in the Civil and Environmental Engineering Department. The 2-day summit brought together technology and business experts along with corporate executives from to discuss how disruptive technology is changing commercial markets within cities. Topics ranged from cyber currency, autonomous vehicles, latest developments in IoT, artificial intelligence, predictive analytics, and impacts on individuals and communities.

May 2018
<u>mediaX2018 Conference: Transparency and Trust in a World of Social Bots</u>
Trust is an important part of every relationship, whether it's human-human or human-AI. How this trust develops is an essential question for the world we live in. AI entities can use personality to build relationships and maintain trust, but trust is not synonymous with 100% assurance. With this as a backdrop, the May 8th mediaX2018 Conference, "Transparency and Trust in a World of Social Bots," brought together Stanford scholars and industry leaders for a deep dive exploration of key issues in authenticity, reliability, reputation, transparency and trust.

7f. Member workshops
Feb 2018
2018 mediaX Global Innovation Workshop
Emerging technologies, such as machine learning, the internet of things and artificial intelligence-driven experiences, offer new opportunities for smart conversational agents in crosswalks, elevators, offices, homes, and vehicles of all varieties. These technology applications promise more mobility options, ubiquitous access and personalized services, better use of time, and more fulfilled lives. Novel technologies used in consideration of their human implications enhance the redesign of mobile experiences, in interior and exterior environments, from micro to macro, for living and for education.

March 2018
Human Sciences and Information Technologies for Innovation and Training for Transportation Infrastructure
Two 2.5-day mediaX Global Innovation Leadership Workshops in Brasilia Brazil, for Innovation and Training for Transportation Infrastructure, provided a multifaceted, hands-on exploration of issues and possibilities, with a focus on bridging the perspectives of thought leaders, educators, innovation executives, and change makers to inspire a Roadmap for Transformation of the Instructional Infrastructure. One workshop was directed to executives and agency leaders; one workshop was directed to educational administrators and lead instructors. Presenters included:
- Paulo Blikstein, Assistant Professor, Graduate School of Education, *Learning at the Speed of Change*
- Martin Carnoy, Professor Graduate School of Education, *Economics of Education and Training* and *Future-proofing Transportation Training Programs*
- Raquel Coelho, Doctoral Student, Graduate School of Education, *Preparing Students for Learning Futures*
- Neil Jacobstein, Distinguished mediaX/HSTAR Visiting Scholar, *Artificial Intelligence and Exponential Change* and *Decision Quality Criteria and Adaptation*
- Martha Russell, mediaX/HSTAR, *Ecosystem Design and Orchestration*
- Ram Rajagopal, Associate Professor, Civil & Environmental Engineering, *Data Analysis Mindset*

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June 2018

Human Sciences and Information Technologies for Innovation and Training for Transportation Infrastructure

This five-day workshop at Stanford provided an opportunity for business leaders and agency executives to thought leaders from Stanford and Silicon Valley to explore critical issues, experience interest-driven, activity-oriented pedagogical approaches to learning, and imagine solutions for the transformation of the transportation training infrastructure. Presentations included:

- Robert Burgelman, Professor, Graduate School of Business, Executive Director of the Stanford Executive Program, *Strategic Leadership in Dynamic Environments*
- Bruce Cahan, Distinguished Visiting Scholar of mediaX/HSTAR and Codex Fellow, *Value-Based Performance Measures*
- Kathryn Shaw, Professor Economics, Graduate School of Business, *The Value of Bosses in the Digital Transformation*
- Neil Jacobstein, Distinguished Visiting Scholar of mediaX/HSTAR, *Decision Quality Criteria and Adaptation in Data Analysis*
- Donovan Corliss, Manager, SF MTA, *Location-Based Intelligence*
- Karen Hsu, Head of Growth, BlockCypher, *BlockCypher and Blockchain Intel*
- Dave Cavander, Distinguished Visiting Scholar of mediaX/HSTAR, *Readiness for Leveraging Transportation Data*
- Dr. Jennifer Taylor-Mendoza, VP Instruction, Skyline College, *Education for Tomorrow's Jobs*
- Van Ton-Quinlivan, Executive Vice Chancellor for Workforce & Digital Futures, California Community Colleges, *California Community Colleges: Doing What Matters*
- Andrea Vizenor, Director, Center for Career and Workforce Programs, Skyline College, *Digitization and Transportation Pathway Highlights & Innovations*
- David Sirkin, Executive Director, Center for Design Research, *Teaching AI Driving Systems About Human Values*
- Anne Palmer, Executive Director, Stanford Educational Leadership Initiative, *A Case Study: ADTP and Tesla Foundation*
- Michael Bennon, Managing Director, Global Projects Center, Civil & Environmental Engineering, & Raymond Levitt, Kumagai Professor, School of Engineering, *Quantifying Synergies for Public Private Partnerships*
- Paulo Blikstein, Assistant Professor, Graduate School of Education and Computer Science (courtesy), *Interest-driven, Activity-based Learning: Robotics Example*
- Byron Reeves, Professor, Communication and Graduate School of Education (courtesy), *Designing for Screenomics and the Pause Button*

Aug 2018

Innovation in Human Science & Information Technologies for the Experience Economy

With a focus on the Experience Economy, this program built on Stanford's multidisciplinary expertise at the intersection of people and information technology and featured a human science and information technology lens on issues related to Motivation, Innovation, Design Thinking, Sustainability and Future Trends. Presenters included:

- Martha Russell, Executive Director, mediaX at Stanford University: *Introduction to Silicon Valley and Stanford University*
- Robert Burgelman, Professor, Graduate School of Business, Executive Director of the Stanford Executive Program: *Strategic Leadership in Dynamic Environments*
- Jeff Hancock, Professor, Department of Communication, founder Stanford Social Media Lab: *Online Social Infrastructure*
- Kathryn Shaw, Professor, Graduate School of Business: *The Value of Bosses in Digital Transformation*
- Tamara Carleton, Foresight and Innovation Forum: *Engagement with Strategic Foresight & Innovation*

- Sean Follmer, Assistant Professor of Mechanical Engineering: *Haptic Experiences in Automated Systems*
- Walter Greenleaf, mediaX/HSTAR Distinguished Visiting Scholar and VHIL: *VR/AR Experiences*
- Michael Bernstein, Assistant Professor, Computer Science: *Dream Teams and Pop Up Employers*
- David Sirkin, Lecturer, Electrical Engineering, Executive Director of Interaction Design at the Center for Design Research, Mechanical Engineering: *Teaching Robots about Human Values*
- David Cavander, mediaX Distinguished Visiting Scholar, Principal Scientist at Adobe (retired): *Teaching Human Values to AI*
- Karin Forssell, Director, Learning, Design and Technology Master's Program at the Graduate School of Education: *Workforce of the Future*

Workshop on "Innovating at the Intersection of People and Information Technologies"

This program built on Stanford's multidisciplinary expertise at the intersection of people and information technologies and featured a human science and information technology lens on issues related to Leadership, Innovation, Marketing, Design Thinking and Future Trends. Presenters included:

- Martha Russell, Executive Director, mediaX at Stanford University: *Introduction to Silicon Valley and Stanford University*
- Robert Burgelman, Edmund W. Littlefield Professor of Management, Executive Director of the Stanford Executive Program (SEP): *Strategic Leadership in Dynamic Environments*
- Neil Jacobstein, mediaX/HSTAR Distinguished Visiting Scholar: *Exponential Change*
- Chuck House, mediaX Distinguished Visiting Scholar: *History of Innovation at the Computer History Museum*
- Jeff Hancock, Professor, Department of Communication, founder Stanford Social Media Lab: *Online Social Infrastructure*
- Greg Kress, Founder, Radicand: *Design Thinking*
- Tamara Carleton, Foresight and Innovation Forum: *Engagement with Strategic Foresight & Innovation*
- Barbara Karanian, Founder, Design Entrepreneuring Studio, Lecturer, previously Visiting Professor, Mechanical Engineering Design Group: *Finding Your Story*
- David Sirkin, Lecturer, Electrical Engineering, Executive Director of Interaction Design at the Center for Design Research, Mechanical Engineering: *Teaching Robots about Human Values*
- Michael Bernstein, Assistant Professor of Computer Science: *The Future of Work*
- Karin Forssell, Director, Learning, Design and Technology Master's Program at the Graduate School of Education: *Workforce of the Future*
- Walter Greenleaf, mediaX/HSTAR Distinguished Visiting Scholar and VHIL: *Human/Robot/Machine Interaction*
- Neerja Raman, mediaX/HSTAR Distinguished Visiting Scholar: *Leading for Global Participation*

7g. Member theme days

Theme Days are in-depth brainstorming sessions with Stanford faculty and industry researchers from a member organization, with a topic inspired by member organizations. Follow-up activities between industry affiliates and the faculty members who attended the intimate, in-depth discussions about issues of common concern during the Theme Days have led to faculty speaking engagements, hiring graduating students, expanded mediaX member relationships, and submission of collaborative proposals.

During the 2017-2018 period, 12 Theme Days were held for mediaX member organizations by mediaX at Stanford University.

A written summary of the presentations and conversations was prepared for each of the following Theme Days:

- Artificial Intelligence and Human/Computer Interaction
- Digital Innovation with AI and Machine Learning to Improve Recommendations, Predictions, and Interactions
- The Intersection of Human Sciences and Information Technologies with a Focus on Sensing and Behavior
- Social Acceptance of AI
- Potential, Performance & Productivity
- Human Machine Interaction at the Intersection of Human Sciences and Information Technologies
- Education Technologies
- Technologies That Connect
- Human Sciences and Information Technologies for Transportation Infrastructure Training
- Challenges for Society 5.0

7h. Faculty involvement:

38 Academic Council faculty members were involved in conducting research and presenting research insights through mediaX programs. Their perspectives, from Business, Humanities & Sciences, Engineering, and Medicine, enriched and extended the intellectual resources of the Graduate School of Education's interdisciplinary expertise. Faculty involvement through presentations at mediaX events provide opportunities for new faculty members to explore the mediaX intersection and connect with other academic and industry researchers pursuing studies that include both human sciences and information technologies.

- **Maneesh Agrawala**, Professor of Computer Science and Director of the Brown Institute for Media Innovation
- **Jeremy Bailenson,** Professor, Communication and Graduate School of Education (courtesy) and Director of the Virtual Human Interaction Lab
- **Brigid Barron,** Professor of Education and the Learning Sciences at Stanford's Graduate School of Education
- **Michael Bernstein,** Assistant Professor, Computer Science
- **Bryan Brown,** Associate Professor and Associate Dean, Graduate School of Education
- **Robert Burgelman,** Professor, Graduate School of Business
- **Janet Carlson,** Associate Professor (Research), Graduate School of Education
- **Martin Carnoy,** Professor, Graduate School of Education
- **Chris Chafe,** Professor, Music and Computer Science (courtesy)
- **Geoffrey Cohen,** Professor, Graduate School of Education
- **Chuck Eesley,** Associate Professor, Management Science & Engineering
- **Sean Follmer**, Assistant Professor of Mechanical Engineering, and by Courtesy, of Computer Science
- **Sharad Goel,** Assistant Professor of Management Science & Engineering and Sociology and Computer Science (courtesy)
- **Shelley Goldman,** Professor and Associate Dean, Graduate School of Education
- **Gabriela Harari,** Assistant Professor, Communication
- **Jeff Hancock,** Professor, Communication
- **Pamela Hinds,** Professor of Management Science and Engineering, and Director of the Center on Work, Technology and Organization
- **Doug James,** Professor of Computer Science, and, by courtesy, of Music at Stanford.
- **Michael Kirst,** Professor, Graduate School of Education
- **James Landay,** Professor, Computer Science
- **Prashant Loyalka**, Assistant Professor, Graduate School of Education, and Research Fellow at the Freeman Spogli Institute for International Studies

- **Margaret Levi,** Professor, Political Science and Director, Center for the Advanced Study of the Behavioral Science
- **Harikesh Nair,** Professor of Marketing at the Graduate School of Business
- **Allison Okamura**, Professor, Mechanical Engineering and Computer Science (courtesy), and Director of the CHARM (Collaborative Haptics and Robotics in Medicine) Lab
- **Khatib Oussama,** Professor, Computer Science and Director, Stanford Robotics Lab
- **Roy Pea,** Professor of Education, Co-Founder and Faculty Director of the H-STAR Institute, Director of the PhD Program in Learning Sciences and Technology Design and Professor, Computer Science (courtesy)
- **Woody Powell,** Professor, Graduate School of Education and Professor of Sociology, Organizational Behavior, Management Science and Engineering, and Communication (courtesy)
- **Ram Rajagopal,** Associate Professor, Civil & Environmental Engineering
- **Byron Reeves,** Professor Communication and Graduate School of Education (courtesy)
- **Ingmar Riedel Kruse**, Assistant Professor, Bioengineering
- **Daniel Rubin,** Associate Professor of Radiology, of Medicine, of Biomedical Data Science, and, by Courtesy, of Ophthalmology, Stanford
- **Manish Saggar,** Assistant Professor, Psychiatry and Behavioral Sciences
- **Daniel Schwartz,** Professor and Dean, Graduate School of Education
- **Michael Shanks,** Professor, Classics
- **Kathryn Shaw,** Professor, Economics, Graduate School of Business
- **Mitchell Stevens,** Associate Professor, Graduate School of Education
- **Johan Ugander,** Assistant Professor, Management Sciences and Engineering
- **Sam Wineburg,** Professor, Graduate School of Education and History (courtesy)

Additional Stanford-Affiliated Thought Leaders:

37 Stanford affiliated researchers and thought leaders participated in mediaX activities. The participation of graduate students, research scientists, and visiting scholars with a wide variety of research interdisciplinary interests augmented faculty expertise for mediaX programs and activities.

- **Brett Alpert,** Associate Dean of Career Education & Director of Career Ventures
- **Tanya Aitamurto,** Postdoctoral Fellow at the Brown Institute for Media Innovation at the School of Engineering at Stanford
- **Banny Banarjee**, Director, Change Labs
- **Michael Bennon,** Director Global Projects Center, Civil and Environmental Engineering
- **Suzanne Burrows,** Strategy Implementation Manager, Center to Support Excellence in Teaching (CSET)
- **Bruce Cahan,** Distinguished Visiting Scholar with mediaX/HSTAR and Fellow Codex
- **Vinay K. Chaudhri**, Program Director, Artificial Intelligence (AI) Center at SRI International.
- **Geoffrey Cox,** Senior Associate Dean, Graduate School of Education
- **Keith Devlin,** Executive Director HSTAR
- **David Evans,** Distinguished Visiting Scholar with mediaX/HSTAR
- **Karin Forssell**, Director, Learning, Design & Technology Program, Graduate School of Education
- **Megan French,** PhD Candidate, Communications
- **Renate Fruchter,** Founding Director of the Project Based Learning Laboratory (PBL Lab) and Senior Research Engineer at the Department of Civil and Environmental Engineering at Stanford University
- **Walter Greenleaf**, Distinguished Visiting Scholar with mediaX/HSTAR and the Virtual Human Interaction Lab (VHIL)
- **Wendy Ju,** formerly Senior Research Engineer, Mechanical Engineering and Executive Director, Center for Design Research
- **Chuck House,** Distinguished Visiting Scholar with mediaX/HSTAR
- **Neil Jacobstein,** Distinguished Visiting Scholar with mediaX/HSTAR
- **Barbara Karanian,** Lecturer, School of Engineering
- **Rene Kizilcec,** Director of Digital Learning Research, Stanford University, Assistant

Research Professor, Arizona State University
- **Poruz Khambatta,** PhD Student, Organizational Behavior, Graduate School of Business, advised by Michal Kosinski, Graduate School of Business
- **Paul Kim,** Chief Technology Officer and Assistant Dean of the Graduate School of Education at Stanford University
- **Ranjay Krishna,** PhD Candidate/Researcher in the Artificial Intelligence Laboratory, co-advised by Professors Fei-Fei Li and Michael Bernstein.
- **Ray Levitt,** Professor, Civil and Environmental Engineering
- **Fernano Lopez Lezcano,** Lecturer, Stanford University Center for Computer Research in Music and Acoustics (CCRMA)
- **David Markowitz,** PhD Candidate, Communication, advised by Jeff Hancock
- **Romain Michon,** PhD Candidate, Stanford University Center for Computer Research in Music and Acoustics (CCRMA)
- **Paulo Parigi,** Associate Director, IRiSS
- **Chris Proctor,** PhD Candidate, Learning Sciences Technology & Design, Stanford Graduate School of Education
- **Scott Rozelle**, Senior Fellow at FSI, Co-Director of the Rural Education Action Program
- **Martha Russell,** Executive Director, mediaX
- **Niloufar Salehi,** PhD Student, Human Computer Interaction, Copmuter Science
- **David Sirkin,** Executive Director, Center for Design Research
- **Neeraj Sonalkar,** Senior Research Engineer, Center for Design Research
- **Cathy Williams**, Co-Founder and Executive Director of youcubed.org
- **Sandra Winter,** Research Associate, Stanford Prevention Research Center, and Director, Well Living Laboratory
- **Nette Worthey,** Stanford University Center for Computer Research in Music and Acoustics
- **Esther Wojcicki**, mediaX/HSTAR Distinguished Visiting Scholar

7i. Seminars
The mediaX Seminar Series continued in 2017-2018 with seminars given by academic and industry researchers to explore horizon issues germane to emerging research questions. Attendance for mediaX seminars is open, pending space availability, without charge.

Sept-Dec 2017
Interactive Media & Games Seminars
Interactive media and games increasingly pervade and shape our society. In addition to their dominant roles in entertainment, videogames play growing roles in education, arts, science and health.

For the 9th consecutive quarter, mediaX supported this 1-unit academic course with promotion, video recording, and curated online publication of videos. The talks brought together a diverse set of experts to provide interdisciplinary perspectives on these media regarding their history, technologies, scholarly research, industry, artistic value and potential future. The series also provided a topical lens for the diverse aspects of human lives. The series sponsorship has catalyzed campus student organizations and cross-disciplinary faculty collaborations with leading game and media organizations.

Jan-Feb 2018
Creating AI Conversations Panel Series
Creating AI Conversations was a series of panel discussions that delved into the thinking, research, and process around crafting the personalities, conversations, and interactions of AI entities with people. Conversational Artificial Intelligence (AI) personalities are playing an increasing role in our everyday lives. In addition to our personal assistants, industries such as education, healthcare, hospitality, transportation, and law are using AI to varying degrees. As conversational AI becomes integrated in our society, serious thought is needed to mindfully create these personalities and conversations. These will be personalities that

not only keep us company and help to make our daily lives easier, but also coach us into changing our behavior, help us navigate the world, and teach our children.

- Behavior change and AI
- Personality and Voice in AI
- Children and AI
- Race, Gender and Ethnicity and AI
- Voice User Interface Design

May 2018
Trust, Transparency & Technology Panel Discussions
Trust, Transparency & Technology was a series of panel discussions that delved into the research, concepts and tools that may help create open collaborations in a world of automated intelligent agents, algorithm-driven interactions, and machines that can learn what humans cannot explain. Information technologies are expanding the parameters of media, pervading our environments, our systems, and our daily lives. The direct connection between people and their data is now brokered via algorithms. Machine learning, pattern recognition, and sensor driven applications play out behind the scenes. Understanding the conditions that help to build trust is a worthy challenge for the open, non-linear, multi-faceted, and globally connected world we live in.

- Trust and Transparency in Interdisciplinary Collaborations
- Trust and Transparency in Human-AI Collaborations
- Trust and Transparency in Personalized Algorithms

7j. Outreach
During the period September 2017 to August 2018 mediaX held 66 meetings to describe Stanford's research expertise at the intersection of human sciences and information technologies for business, educational and government organizations, around the world. (* indicates presentations at the company location.)

*CERTI Foundation and Sapiens Park. BRAZIL
*CNI. BRAZIL
*CNT. BRAZIL
*E.J.Gallo. USA
*FIBRA. BRAZIL
*Fujitsu. JAPAN
*Guangzhou Qitian Technology Co. CHINA
*HKUST Shenzhen Incubation Center. CHINA
*Hong Kong Productivity Council. CHINA
*Huawei. CHINA
*Japanese innovation Network. JAPAN
*Japanese Science & Technology Agency. JAPAN
*Konica Minolta. JAPAN
*Midea. CHINA
*OMRON. JAPAN
*SESI-SC. BRAZIL
*Skyline Community College. USA
*Sony PlayStation. USA
*The San Francisco Aquarium. USA
*Yindu Ogilvy. CHINA
*Yuto. CHINA

Acario Innovation. JAPAN.
Acuitus. USA.

Angola Cables. AFRICA
Atmosphera. BRAZIL
Bank of the West/BNPP. FRANCE.
Benetech. USA.
Blockcypher. USA.
Business Finland. FINLAND
Business Reactor. USA.
CCTV. CHINA
CETIQT. BRAZIL.
Chengdu Heyuanmeizeh Educational Technology Company. CHINA.
Cisco. USA.
Elisa. Finland.
Facebook. USA.
Genentech. USA/SWITZERLAND.
Getty Images. USA.
Global Fine Arts Awards. USA
Hitachi. JAPAN.
Honda Research Institute USA. USA/JAPAN.
IBM USA.
Institute for Culture Creativity of Tsinghua University. JAPAN.
Intel. USA.
Interior Architects. USA.
IVOW. USA.
James Hardie. AUSTRALIA/IRELAND.
Korean Investment Partners. South KOREA/CHINA.
March for Science. USA.
Nanjing Municipal Science and Technology Commission. CHINA
Novim Awards – Kavli Institute. USA.
Nytro Marketing. MEXICO.
Oracle. USA
Peking University. CHINA.
Samsung. SOUTH KOREA.
Silicon Valley Technical Council. CHINA.
Softbank Robotics. JAPAN.
South African University. SOUTH AFRICA
Talla. USA.
Target. USA.
Tohoku Forum for Creativity. JAPAN.
Tsingua University. CHINA
University of Heksinki. Finland.
University of Helsinki. FINLAND
University of Illinois. USA.
VR Voice. USA.

Email Campaigns:
58 email communications to members in 2017-2018

Social Platforms:
Facebook, Twitter, Instagram, YouTube presence maintained, all with increased audience

Conference Paper
Presented and published at Hawaii International Conference on System Sciences, January 4-7, 2018:

- Arash Hajikhani, Erin Lorelie Young, Karina Alexanyan, Jason Wilmot, and Martha Russell. **"**University-Industry Programs as Platforms: A Case Study of Multi-Disciplinary Network Development."

7k. GSE impact

Aside from the direct impact of funding/supporting GSE researchers, a large part of mediaX impact can be seen on and off campus and in the dialogues created between GSE researchers and researchers working on education related topics in other schools/ departments. Our various events – theme days, conferences, and research themes promote conversations, information sharing, learning and cross-pollination of ideas – among scholars and across departments in the colleges at Stanford University: GSE, H&S, CoE, Med, Law, GBS. They highlight research and contributions in settings and contexts inside the GSE and across Stanford. They also connect the GSE with innovative research from other departments, colleges and industry, that advances education and learning, serving to foster a vibrant interdisciplinary network.

GSE Faculty member receiving mediaX research grant
- Geoffrey Cohen, "*Using Mobile Technology to Bring Social Psychological Interventions to the Workplace"*

GSE faculty, researcher and student participation in mediaX events
- **Brigid Barron,** Professor of Education and the Learning Sciences at Stanford's Graduate School of Education
- **Bryan Brown,** Associate Professor and Associate Dean, Graduate School of Education
- **Suzanne Burrows,** Strategy Implementation Manager, Center to Support Excellence in Teaching (CSET)
- **Rachel Coelho,** Graduate Student, Graduate School of Education
- **Geoffrey Cohen,** Professor of Organizational Studies in Education and Business Professor of Psychology, and Psychology, and Professor of Organizational Behavior (courtesy)
- **Geoffrey Cox,** Senior Associate Dean Graduate School of Education
- **Karin Forssell**, Director, Learning, Design & Technology Program, Graduate School of Education
- **Shelley Goldman,** Professor and Associate Dean, Graduate School of Education
- **Paul Kim,** Chief Technology Officer and Assistant Dean of the Graduate School of Education at Stanford University
- **Michael Kirst,** Professor Emeritus of Education, Graduate School of Education, and Professor of Business Administration
- **Roy Pea,** Professor of Education, Co-Founder and Faculty Director of the H-STAR Institute, Director of the PhD Program in Learning Sciences and Technology Design and Professor, Computer Science (courtesy)
- **Chris Proctor,** PhD Candidate, Learning Sciences Technology & Design, Stanford Graduate School of Education
- **Woody Powell,** Professor, Graduate School of Education and Professor of Sociology, Organizational Behavior, Management Science and Engineering, and Communication (courtesy)
- **Dan Schwartz,** Professor and Dean, Graduate School of Education
- **Mitchell Stevens,** Associate Professor, Graduate School of Education
- **Cathy Williams**, Co-Founder and Executive Director of youcubed.org
- **Sam Wineburg,** Professor, Graduate School of Education and History (courtesy)

8. H-STAR Faculty and Staff Publications and Awards in AY 2017-2018

Awards:

2018: H-STAR Director Roy Pea was awarded an Honorary Degree, Doctor of The University: The Open University, Milton Keynes, UK

2018: H-STAR Director Roy Pea was appointed Inaugural Fellow, International Society for the Learning Sciences

Publications:

Barron, B.

Barron, B. & Levinson, A.L. (2017). Media as a catalyst for children's engagement in learning at home and across settings. In E. Gee, L. Takeuchi, E., Wartella (Eds.), *Children and Families in the Digital Age*, pp. 17-36. New York: Taylor & Francis.

Levinson, A., & Barron, B. (2018). Latino immigrant families learning with digital media across settings and generations. *Digital Education Review*, (33), 150-169.

Darling-Hammond, L., Cook-Harvey, C., Flook, L., Barron, B., Osher, D. (in press). Science of Learning and Development: Implications for Educational Practice. To appear in *Applied Developmental Science*.

Devlin, K.

Devlin, K. How mathematicians learned to stop worrying and love the computer, *Proc of the Borwein Commemorative Conference, 2017*, in press.

Devlin, K., Ketamo, H., & Kiili, K., Gamifying Assessment: Extending Performance Measures with Gaming Data, AERA 2018 National Meeting, New York City, April 2018.

Murtagh, F. & Devlin, K., Data Science in Education, Employment, Research: Data Revolution for Sustainable Development, *Big Data and Cognitive Computing: Feature Papers 2018, MDPI*, June 2018.

Atienza, S., Matlen, B., Devlin, K. & Weiner, R., Game-Based Learning with Direct Representation of Mathematics, Connected Learning Summit, MIT, Cambridge, MA, August 1–3, 2018.

Devlin, K. & Matlen, B., Design for math learning games that "break the symbol barrier": Using direct, game-based representations for mathematics, *WestEd Insights*, August 18, 2018. https://wested.org/research-evaluation/wested-insights/

Fishkin, J. S.

Fishkin, James S., Senges, M., Donahoe, E., Diamond, L., Siu, A. (2017). "Deliberative polling for multistakeholder internet governance: considered judgments on access for the next billon." *Information, Communication & Society.* doi: 10.1080/1369118X.2017.1340497

Fishkin, James S., Roy William Mayega, Lyn Atuyambe, Nathan Tumuhamye, Julius Ssentongo, Alice Siu and William Bazeyo (2017). "Applying Deliberative Democracy in Africa: Uganda's First Deliberative Polls." *Daedalus: Journal of the American Academy of Arts and Sciences* 146(3): 140-154.

Jane J. Mansbridge and James S. Fishkin eds. (2017) "Prospects and Limits of Deliberative Democracy," Issue of Daedalus: Journal of the American Academy of Arts and Sciences 146(3): 6-13.

"Random Assemblies for Lawmaking? Prospects and Limits." <u>Politics & Society</u> vol 46, no 3, August 2018, pp 359-79.

James S. Fishkin Democracy *When the People Are Thinking: Revitalizing Our Politics Through Public Deliberation* (Oxford: Oxford University Press, 2018

Hamilton, J.

Hamilton, J. & Morgan, F., "Poor Information: How Economics Affects the Information Lives of Low-Income Individuals, *International Journal of Communication* 12(2018), 2832-2850.

Hamilton, J. "FOIA and Investigative Reporting: Who's Asking What, Where, and When – and Why It Matters," in David Pozen and Michael Schudson (eds.), *Troubling Transparency: The History and Future of Freedom,* (New York: Columbia University Press, 2018).

Pea, R. D.

Pea, R., & Cole, M. (2019, in press). The living hand of the past: The role of technology in development. *Human Development*.

Markowitz, D.M., Laha, R., Perone, B.P., Pea, R.D., & Bailenson, J.N. (2018, in press). Immersive virtual reality field trips facilitate learning about climate change. *Frontiers in Psychology*.

Schneider, B., Sharma, K., Cuendet, S., Zufferey, G., Dillenbourg, P., & Pea, R. D. (2018). Leveraging mobile eye-trackers to capture joint visual attention in co-located collaborative learning groups. *International Journal of Computer-Supported Collaborative Learning*, *12*, 1-21.

Pea, R. (2018). Foreword. In Lahlou, S. *Installation Theory: The societal construction and regulation of behavior* (pp. xiii-xx). New York: Cambridge University Press.

Niemi, D., Pea, R.D., Clark, R.E. & Saxberg, B. (2018). (Eds.). *Learning Analytics in Education*. Charlotte, NC: Information Age Publishing.

Niemi, D., Pea, R., & Piety, P. J. (2018). Introduction. In D. Niemi, R.D. Pea, B. Saxberg, & R.E. Clark (Eds.). *Learning Analytics in Education*. Charlotte, NC: Information Age Publishing.

Piety, P. J., & Pea, R. D. (2018). Understanding learning analytics across practices. In D. Niemi, R.D. Pea, R.E. Clark, & B. Saxberg. (2018). (Eds.). *Learning Analytics in Education*. Charlotte, NC: Information Age Publishing.

Grover, S., & Pea, R. (2018). Computational thinking: A competency whose time has come. In S. Sentance, E. Barendsen & C. Schulte (Eds.), *Computer science education: Perspectives on teaching and learning* (pp. 19-38). London: Bloomsbury.

Reeves, B.

Yeykelis, L., Cummings, J. J., & Reeves, B. (2018). The Fragmentation of Work, Entertainment, E-Mail, and News on a Personal Computer: Motivational Predictors of Switching Between Media Content. *Media Psychology*, *21*(3), 377-402.

Cummings, J. and B. Reeves (2018). Stimulus Sampling and Research Integrity. In L. Jussim, S.T. Stevens and J.A. Krosnick (eds), *Research Integrity in the Behavioral Sciences*. Oxford University Press (in press).

Reeves, B., and N. Ram, T.N. Robinson, J. J. Cummings, L. Giles, J. Pan, A. Chiatti, MJ Cho, K. Roehrick, X. Yang, A. Gagneja, M. Brinberg, D. Muise, Y. Lu, M. Luo, A. Fitzgerald & L. Yeykelis (2018**)**. *Screenomics*: A Framework to Capture and Analyze Personal Life Experiences and the Ways that Technology Shapes Them. (Under revision, *Human-Computer Interaction*).

Chiatti, A., MJ Cho, A. Gagneja, X. Yang, M. Brinberg, K. Roehrick, S. Ray Choudhury, N. Ram, B. Reeves, C.L. Giles. Text Extraction and Retrieval from Smartphone Screenshots: Building a Repository for Life in Media. *Proceedings of the 33rd ACM/SIGAPP Symposium on Applied Computing (SAC 2018)*. Pau, France. April 9-13, 2018.

Reeves, B., J. Hancock and S. Liu (2018). How do people perceive social robots and what makes them effective. Paper submitted to *Journal of Human-Robot Interaction*.

Ram, N., Yang, X., Cho, M-J, Brinberg, M., Muirhead, F., Robinson, T. N., & Reeves, B. (2018). Teen screenomes: Describing and interpreting adolescents' day-to-day digital lives. Submitted for publication to the *Journal of Adolescence Research.*

Ram, N., & Reeves, B. (2018). Time sampling. In M. H. Bornstein, M. E. Arterberry, K. L. Fingerman, & J. E. Lansford (Eds.), *Encyclopedia of Lifespan Human Development* (pp. 2247-2248). Thousand Oaks, CA: Sage.

Li,, J., W. Ju, and B. Reeves (2017). Touching a Mechanical Body: Tactile Contact with a Humanoid Robot is Physiologically Arousing. *Journal of Human-Robot Interaction*, Vol. 6 No. 3, 118-130.

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