MIT Libraries  
Annual Report FY 2017

Program on Information Science  
by Micah Altman, Director of Research

The Libraries’ pioneering decision, over fifteen years ago, to develop a general research program established its reputation for information science research and led to the development of tools and approaches used by many memory institutions and individual researchers. The Program on Information Science continues this tradition of applied research in information management, scholarly communication, dissemination, and preservation.

Goals

The current Program on Information Science was initiated as part of the Libraries general research efforts in 2012.

The mission of the program is to solve emerging problems in information management that are essential to support new and innovative services, and to amplify the impact that MIT can have on the development of information science, information policy, and scholarly communication through participation in the development of standards, policy, and methods related to information science and information management.

The program has five overarching goals:

- Solve emerging research problems in information acquisition, protection, management, dissemination, communication, and stewardship that are essential to support future innovative services.
- Collaborate with faculty to develop innovative approaches to research information and research outputs.
- Future-proof planning, by incorporating the best-of-class research findings in information science, data science, and other fields into our policies, planning and practices.
- Identify, gain recognition for, and generalize the innovations that the Institute and MIT community is making to solve their own problems or to advance the information commons.
- Amplify the impact that MIT can have on the development of information science, information policy, and scholarly communication through participation in the development of standards, policy, and methods related to information science and information management.

Research Portfolio

The research program has established a portfolio in several areas of ongoing research including:
• **Information Privacy**
  o The program continues its collaboration with Harvard University and Microsoft Research in the NSF and Sloan-funded “Privacy Tools for Research Data” project. Which aims to develop a better understanding of the practical performance and usability of a variety of algorithms for analyzing and sharing privacy-sensitive data. Last year this project was awarded a research supplement to support bringing additional students and trainees. This year the project published numerous articles, presentations, and commentaries.
  o This year, the program worked with JPAL to develop and deliver a MOOC module on data privacy and security that is now part of MITx’s micromaster sequence in field research in economics.
  o This year, the program supported research interns conducting research in library privacy.

• **Transparency -- Open Data, Open Government, and Scientific Reproducibility**
  o The program develops its collaborate with the University of Florida and ITAM on the Public Mapping Project, which uses crowd-sourced GIS information to stimulate public participation in electoral mapping and to advance research in related areas of political science, law, and public administration. As a result of this research, an article on *Open Data, Political Representation and Redistricting in Mexico* was published in a top-tier journal.

• **Enhancing Teaching and Learning**
  o The program continues its collaboration with TERC, and Landmark University to study how big data in education can be augmented with measurements of student attention, and how that big educational data may be managed and shared. This year, the project ran experiments and collected data from 40 subjects – we expect the results to be published in journals and workshops.
  o This year, the program supported two graduate research interns in conducting research in applying Virtual Reality in the library environment. A book chapter describing this research is forthcoming.

• **Scholarly Communications**
  o Through participation on the board of ORCID and Force11, the program is actively engaging with the emerging development of new standards and practices in researcher identification and evaluation.
  o This year, the program worked with Force11 to develop and publish the *Joint Software Citation Principles*.
  o This year, working with former program students and collaborators at the program conducted research and published a study on *Evaluating and Promoting Open Data Practices in Open Access Journal*.

• **Digital Stewardship and Preservation**
  o Through participation on the board of coordinating committee of NDSA, the program is actively engaging with the emerging development of new standards.
and practices in digital preservation

- This year, the program hosts a CLIR postdoc in software curation, and is investigating software as a scholarly object.
- Thus year the program supported Research Affiliates in conducting research into preservation risks through computer simulation and other methods.
- This year, the program published joint research on preservation practices: *Trends in Digital Preservation Capacity and Practice: Results from the 2nd Bi-annual National Digital Stewardship Alliance Storage Survey*

**Outreach, Dissemination, Recognition, & Engagement**

**Outreach to the Community**

In FY17 the Program Contributed to a number of initiatives supporting the MIT community:

- The program hosted a monthly “brown-bag” seminar series cover a broad range of developments in information science relevant to libraries and scholarly communications, which included visiting presenters MIT, national universities, and industry. This attracted students, postdocs, and research staff representing many departments across the Institute and beyond.
- The program delivered invited seminars for the MIT and Boston postdoctoral associations in grant writing, and confidential information management.
- As described above, under research, the program worked with JPAL to develop new educational content for its MITx micromasters.

**Broad Dissemination**

In FY17 the program’s external outreach and dissemination activities include:

- Publishing over five professional articles and related to research conducted by the program. This included articles in *Political Geography*, *D-Lib*, *American Politics Research*, and *Peerj*. Additional working papers have been released (through SSRN and the program website) for comment prior to revision. These outputs both represent significant dissemination and recognition, and reflect broad collaboration with a broad set of faculty, researchers, and practitioners.
- Delivering over a half dozen invited talks at, national, and international forums. These talks included delivering a keynote at the *Big Data Innovation Forum*; and at a plenary talk at *Digital Preservation 2016*.
- With research collaborators, the program engaged in policy commentary and standards development – submitting comments on privacy regulations and standards for open data.
Recognition

In FY2017 the program continued to receive national recognition for its activities:

- This year the director continues to hold nominated/elected positions to a number of community organizations including: the National Digital Stewardship Alliance; the ORCID board; the Syracuse Qualitative Data Archive technical advisory board; the Force 11 advisory board; and a number of journal editorial boards.
- This year, the Future of Privacy Forum recognized privacy research authored by the director with a Firestarter award and invited talk.
- This year, the Director joined and was included in Who’s Who in America and in Who’s Who in American Politics.
- This year, program work in redistricting and data curation received media coverage in the Daily Dot, and in the MIT Tech.

Community Engagement

And, the Libraries’ research program engaged with a number of key organizations that are developing or guiding broad standards, infrastructures and community effort.

- The program served as MIT’s institutional representative to NISO. In that capacity it has participated in webinars to NISO members.
- As library representative to the National Digital Stewardship Alliance, and chair of the Coordination Committee, the program helped the NDSA in its transition to a new host. This year, the NDSA completed its transition to DLF as host, and ran its first annual meeting under that new host.
- The program serves as MIT’s representative to the ORCID organization. And the Director was elected last year to serve on the executive committee of the ORCID board. As a part of the board and of the executive committee, the Libraries’ research program continues MIT’s contribution to the direction of Open Researcher & Contributor ID.
- The director served on the Task Force on Data, Software, and Reproducibility in Publication, Association of Computing Machinery, and on Elsevier’s Research Data Management advisory group consulting on scholarly communication and reproducibility.
- The program hosted over 4 library student research interns, and release publications co-authored with three prior interns.

Outlook for Next Year

This year, the Program collaborated with a broad range internal and external faculty and researchers (including faculty in MIT CSAIL, the MIT Media Lab, MIT Sloan School, MIT Materials Sciences, the MIT Political Science Department, Harvard University, TERC, Landmark college, U. Fl., the US Census, and ITAM) to conduct sponsored research and to develop and submit proposals for sponsored activities.
During this FY multiple proposals, pre-proposals and LOI’s were submitted to the Knight Foundation, NSF, the Sloan Foundation, Mellon Foundation, Arnold Foundation and IMLS. One proposal has received informal notice of funding, two others remain under review.

This year, the Program successfully hosted one postdoc, three graduate interns, and one undergraduate intern. These interns have worked with the Program to develop computer models for preservation simulation; to develop a scan of emerging virtual reality products and potential applications in library; to study information privacy in libraries. We plan to recruit additional postdoctoral fellows and students supported by current grants.

**Future Outlook & Vision**

Based on the recommendation from the Future of Libraries task force, the program envisions a transition to IRISSC (Initiative for Research in Information Science and Scholarly Communication).

We envision developing an interdisciplinary research center such as the Berkman-Klein-center at Harvard, that fosters a large thriving community of scholars, projects, fellows; incubates a wide portfolio of research, demonstrations and start-up-like initiatives; is globally recognized across multiple fields; and hosts a steady stream of speakers, workshops, conferences and other events. We aspire for the center to have a major impact on research in the field of information sciences; has a substantial voice in national debates on information policy; engages the library and press community; and informs and is informed by library platform development.

The ultimate purpose of this work will be to promote and inform an ecosystem for research information that not only is scalable, but also supports open and equitable access to information; is based on a transparent and trustworthy platform; and supports widely inclusive participation in knowledge creation and use. In other words our ultimate vision is an information ecosystem that corrects the pathologies of current market-based approaches. IRISSC is intended to ensure that work towards this is informed by rigorous interdisciplinary research and innovative development. This is essential to MIT research having its optimal impact in the world.