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I. Collections, services, and systems

A. Collections

Center for Global Change Science

The Center for Global Change Science (CGCS) seeks to better understand the fundamental processes and mechanisms controlling the global environment. The interdisciplinary Center, founded in 1990, utilizes theory and observations of oceanic, atmospheric, and terrestrial systems, to improve the ability to accurately predict global environmental change. Two major activities of the CGCS are the Climate Modeling Initiative, and the Joint Program on the Science and Policy of Global Change.

The CGCS collection in DSpace contains over 100 reports from 1994 to the present.

Joint Program on the Science and Policy of Global Change Reports https://hpds1.mit.edu/handle/1721.1/3550. This report series communicates research results, and provides useful reviews and commentaries on various aspects of the global climate change issue.

Center for Innovation in Product Development (CIPD)

A joint effort between MIT's School of Engineering and Sloan School of Management, CIPD links the best ideas of academia with the best experience of industry. MIT faculty,

students, and staff join with industrial partners to research the process of product development (PD) from engineering concept to management practice; from product design to market delivery.

CIPD collections in DSpace include 35 papers from 1998 to the present.

- o Distributed Object-based Modeling Environment(DOME): https://hpds1.mit.edu/handle/1721.1/3765
- o Effective Enterprise Learning: https://hpds1.mit.edu/handle/1721.1/3766
- o Implementation Dynamics (ID): https://hpds1.mit.edu/handle/1721.1/3767
- o Incentives and Boundaries (IB): https://hpds1.mit.edu/handle/1721.1/3768
- o Information Flow Modeling (IFM): https://hpds1.mit.edu/handle/1721.1/3769
- o Other CIPD Research: https://hpds1.mit.edu/handle/1721.1/3774
- o Platform Architectures (PA): https://hpds1.mit.edu/handle/1721.1/3770
- o Virtual Customer (VC): https://hpds1.mit.edu/handle/1721.1/3771

Center for Technology, Policy, and Industrial Development (CTPID)

CTPID, a multi-industry research enterprise, applies intellectual tools from engineering, management, and the social sciences to critical industry issues. CTPID's research programs investigate sustainable, global solutions to challenges in aerospace, automotive production, transportation, environmental policy, Internet technology and policy, materials systems, and technology and law.

The CTPID collection in DSpace contains 300 items from 1977 to the present.

- o Cooperative Mobility Program (https://hpds1.mit.edu/handle/1721.1/1779) Global research on sustainable mobility, transportation trends, and economic and environmental impact
- o Materials from early CTPID research, former programs, and associated scholars CTPID Archive (https://hpds1.mit.edu/handle/1721.1/1778)
- o Ford-MIT Alliance (https://hpds1.mit.edu/handle/1721.1/1781) Materials from an Institute-wide collaboration that focuses on statistical engineering, virtual education, and the environment
- o International Motor Vehicle Program (https://hpds1.mit.edu/handle/1721.1/1782) Research on automotive industry dynamics from assembly to the extended enterprise, from e-business to sustainability
- o Aerospace Research Agenda Labor (https://hpds1.mit.edu/handle/1721.1/1784) Research on advancing theory, practice, and policy with respect to the 21st century aerospace workforce
- o Lean Aerospace Initiative (https://hpds1.mit.edu/handle/1721.1/1785) Materials from a collaboration of the U.S. Air Force, aerospace industry, labor, and MIT
- o Lean Sustainment Initiative (https://hpds1.mit.edu/handle/1721.1/1786) U.S. Air Force-industry-MIT research on applying lean principles to the maintenance, repair, and overhaul of defense aircraft

- Materials Systems Laboratory (https://hpds1.mit.edu/handle/1721.1/1788) Analysis of the strategic implications of materials choice in the automotive, electronic, and aerospace industries
- MIT Program on Information Quality (https://hpds1.mit.edu/handle/1721.1/5539) Materials on developing and testing new knowledge and information quality benchmarking standards
- Program on Internet and Telecoms Convergence (https://hpds1.mit.edu/handle/1721.1/1790) Research to identify and shape solutions to technical, economic, or policy hurdles slowing the Internet's evolution as a global communications infrastructure
- Program on Science, Technology, and Environmental Policy (https://hpds1.mit.edu/handle/1721.1/1791) Materials that focus on science and technology components of contemporary environmental issues.
- Technology and Law Program (https://hpds1.mit.edu/handle/1721.1/1793) Research and graduate studies that bring law and technology perspectives to environmental, policy, trade, and sustainability issues.

Computer Science and Artificial Intelligence Lab (CSAIL)

CSAIL was formed by the merger of MIT's Laboratory for Computer Science (LCS) and the Artificial Intelligence Laboratory (AI). It is an interdepartmental laboratory which includes faculty from: Electrical Engineering and Computer Science(http://www.eecs.mit.edu/), Mathematics(http://www-math.mit.edu/), Brain and Cognitive Science(http://web.mit.edu/bcs/), Aeronautics and Astronautics(http://web.mit.edu/aeroastro/www/), Ocean Engineering(http://oe.mit.edu/), the Biological Engineering Division(http://web.mit.edu/be/), and the Harvard-MIT Division of Health Sciences and Technology(http://hst.mit.edu/). CSAIL is also the home of the World Wide Web Consortium(http://www.w3c.org).

The primary mission of CSAIL is research in both computation and artificial intelligence, broadly construed. It is organized into four broad research areas: 1. Architecture, systems, and networks. 2.Theory. 3.Language, learning, vision, and graphics. 4. Physical, biological, and computational systems.

CSAIL collections in DSpace include over 1000 technical reports from 1959 to the present.

- Artificial Intelligence Lab Publications(https://hpds1.mit.edu/handle/1721.1/5459)
- AI Memos
- AI Technical Reports
- Center for Biological & Computational Learning Memos

Department of Ocean Engineering

The goal of MIT's Department of Ocean Engineering is to develop the knowledge and technology to foster and enable the wise and effective use, development, and preservation of the ocean, its natural resources and environment.

Collections in DSpace include:

- Design Project Reports (https://hpds1.mit.edu/handle/1721.1/1780)
- Ocean Engineering Collection (https://hpds1.mit.edu/handle/1721.1/1789)

Department of Political Science

Focused initially on international issues, particularly in the area of security, MIT's Department of Political Science has more recently grown in three main directions. First, a large number of faculty members now specialize in American politics. Second, the Department has developed considerable strength in political economy, both comparative and international. And third, it has extended its coverage of comparative politics by adding faculty members specializing in Europe, Japan, the Middle East, South Asia, and Latin America.

Sub-communities and collections in Dspace include:

- Voting Technology Project (https://hpds1.mit.edu/handle/1721.1/5432)
- Works of Charles Stewart (https://hpds1.mit.edu/handle/1721.1/5523)
- Works of Eugene Skolnikoff (https://hpds1.mit.edu/handle/1721.1/5524)
- Works of Joshua Cohen (https://hpds1.mit.edu/handle/1721.1/5442)
- Works of Stephen Ansolabehere (https://hpds1.mit.edu/handle/1721.1/5528)
- Works of Stephen van Evera (https://hpds1.mit.edu/handle/1721.1/5431)

Laboratory for Information and Decision Systems (LIDS)

The Laboratory for Information and Decision Systems (LIDS) is an interdepartmental research laboratory at the MIT. The laboratory conducts theoretical as well as applied research in the fields of system, communications, control, signal processing and algorithms.

The LIDS collection in DSpace contains over 1000 technical reports from 1969 to the present.

- LIDS Technical Reports (https://dspace.mit.edu/handle/1721.1/1783)

MIT Press

The MIT Press, established as an independent publisher in 1962, is the only university press in the United States whose list is based in science and technology. The Press

currently publishes some 40 journals and about 250 new books each year. It has major publishing programs in six scholarly subject areas -- architecture and design arts, economics and finance, computer science, cognitive and brain sciences, and environmental science -- as well as smaller programs in science and technology studies, political science, and social theory.

MIT Press Collections in DSpace include a selection of 74 digital books spanning the period of 1969 to 1991.

- o MIT Press Out of Print Books (https://dspace.mit.edu/handle/1721.1/1787)

Operations Research Center

Operations research (OR) is the professional discipline that deals with the application of scientific methods to decision making. MIT's Operations Research Center brings together faculty with various research interests from the following departments: Sloan School of Management, Department of Electrical Engineering and Computer Science, Civil and Environmental Engineering, Mathematics, Aeronautics and Astronautics, Urban Studies and Planning, Ocean Engineering, Mechanical Engineering and Nuclear Engineering.

Operations Research Center collections in DSpace include 345 working papers from 1971 to the present.

Operations Research Center (https://dspace.mit.edu/handle/1721.1/5066)

Research Laboratory for Electronics (RLE)

The Research Laboratory of Electronics (RLE) was founded in 1946 as the Institute's first interdisciplinary laboratory. RLE is the successor to the famed MIT Radiation Laboratory of World War II, and was formed to bring together physicists and electrical engineers to work on fundamental and applied understanding of emerging topics related to electronics. Today, RLE continues to be a premier MIT research environment, providing a supportive framework for one of MIT's largest communities of faculty, staff, and student investigators in the departments of Electrical Engineering and Computer Science, Physics, Mechanical Engineering, Materials Science and Engineering, Aeronautics and Astronautics, the Biological Engineering Division, the Engineering Systems Division, and the Harvard-MIT Division of Health Sciences and Technology. RLE investigators pursue a broad and diverse interpretation electronics clustered around six primary themes: 1. circuits, systems, signals, and communications; 2. physical sciences; 3. quantum computation and communication; 4. nanostructures; 5. photonic materials, devices and systems; and 6. communication biophysics.

RLE collections in DSpace include over 600 technical reports from 1946 to the present.

ResearchLaboratory for Electronics(RLE) (https://dspace.mit.edu/handle/1721.1/4058)

Singapore-MIT Alliance (SMA)

The Singapore-MIT Alliance is an innovative engineering education and research collaboration among three of the top engineering research universities in the world: National University of Singapore (NUS), Nanyang Technological University (NTU) and Massachusetts Institute of Technology (MIT). Founded in 1998 to promote global engineering research, SMA has provided thousands of students with an unsurpassed education through the most technologically advanced interactive distance education facilities available.

Collections in DSpace include over 300 conference papers from 2002 to the present.

- o Advanced Materials for Micro- and Nano-Systems(AMMNS) (https://hpds1.mit.edu/handle/1721.1/3650)
- o Computer Science (CS) (https://hpds1.mit.edu/handle/1721.1/3651)
- o High Performance Computation for Engineered Systems (HPCES) (https://hpds1.mit.edu/handle/1721.1/3652)
- o Innovation in Manufacturing Systems and Technology (IMST) (https://hpds1.mit.edu/handle/1721.1/3653)
- o Molecular Engineering of Biological and Chemical Systems (MEBCS) (https://hpds1.mit.edu/handle/1721.1/3654)

Sloan School of Management

Through innovative research, MIT Sloan faculty create and redefine ideas at the forefront of management theory and practice around the globe.

The Sloan School collection in DSpace contains over 1000 working papers from 1968 to the present.

- o Sloan School of Management (https://dspace.mit.edu/handle/1721.1/1777)

Warren M. Rohsenow Heat and Mass Transfer Laboratory

The Warren M. Rohsenow Heat and Mass Transfer Laboratory is dedicated to fundamental and applied research in transport phenomena to support energy technologies, electronics thermal management, manufacturing processes, and leading-edge engineering.

Collections in DSpace include:

- o Historical Essays on Heat Transfer and Heat Engineering at MIT (https://hpds1.mit.edu/handle/1721.1/5551)
- o Rohsenow Symposium on Future Trends in Heat Transfer (https://hpds1.mit.edu/handle/1721.1/5552)

C. Services & Systems

DSpace is a groundbreaking digital library system, developed jointly by MIT Libraries and Hewlett-Packard (HP), to capture, store, index, preserve and redistribute the intellectual output of a university's research faculty in digital formats.

The open source system is freely available to research institutions worldwide. Currently more than 100 organizations have DSpace running as a live system and over 25 others have begun implementing or evaluating it.

DSpace at MIT is a digital storage solution for MIT faculty and researchers. DSpace stores electronic content such as e-prints, working papers, technical reports, datasets, video simulations, images and course materials. The system preserves this material over time—providing increased visibility and accessibility.

DSpace at MIT - http://dspace.mit.edu/

The DSpace Federation – http://dspace.org

II. Projects and programs

A. Projects

Verde—A New System to Manage Electronic Resources

The MIT Libraries and Harvard University Libraries are collaborating with Ex Libris to create a new system to manage electronic resources. This partnership has led to the successful definition of a formal co-development agreement for a new product known as Verde. While the specification work is largely complete, this co-development arrangement is ongoing and should result in an important new product for the library market.

Digital Library Standards

Technology staff of the MIT Libraries are also engaged in defining and developing new international standards which will be required to take the digital library and preservation development agenda forward in the future. These include standards for metadata and content sharing (e.g. METS http://www.loc.gov/standards/mets/) as well as standards for creating infrastructure to support distributed digital preservation (e.g. the Global Digital Format Registry http://hul.harvard.edu/gdfr/). The participation of MIT Libraries experts in these initiatives is helping to insure that MIT is well placed at the center of future research and development initiatives in this area, both in terms of funding opportunities and business opportunities as they arise.

Digital Research Projects

MIT's Digital Libraries Research Group has continued to expand its project portfolio, and is currently working on five grant-funded research projects, in addition to the one that concluded in 2004. The projects range from outreach and educational initiatives to state-of-the-art technology research questions, and demonstrate the breadth and depth of expertise being developed by the MIT Libraries in this area. The current projects include:

DSpace@Cambridge, a collaboration with the Cambridge University Library in the UK with funding from the Cambridge-MIT Institute to deploy DSpace at Cambridge University, promote DSpace in the UK, and develop the system in the areas of digital preservation and support for educational technology.

http://www.lib.cam.ac.uk/dspace/

LEADIRS (LEarning About Digital Institutional Repositories Seminars), another CMI-funded initiative offers an innovative series of seminars to help higher education and further education institutions in the UK to develop their own plans for creating an institutional repository service (using DSpace or other software of their choosing).

SIMILE, a collaboration with MIT CSAIL, the W3C, and HP Labs to bring the Semantic Web technology into the real-world domain of library metadata and to integrate that technology into DSpace.

http://simile.mit.edu/

CWSpace, a Microsoft iCampus-funded project to investigate the standards and protocols necessary to archive educational material produced under the OpenCourseWare initiative into long-term digital repositories like DSpace. http://cwspace.mit.edu/

DSRB, a project funded by the US National Archives and Records Administration through the NSF to collaborate with the University of California, San Diego Libraries and the San Diego Supercomputer Center on an investigation of using data grid technology for content storage, as implemented by the SDSC's SRB open source storage management technology.

III. Specific Digital Library Challenges

Building an open source community in the digital library domain

Projects such as DSpace offer an opportunity to bring the collective resources of universities to bear on a number of issues challenging today's research libraries such as open access to scholarly resources and digital preservation. Open source projects rely on the talent and resources of the entire user community to thrive. DSpace has been

fortunate to attract a community of open source developers who have lent their expertise. They are already making improvements to the system, and more are underway or planned. Experience with the platform continues to widen, both technically and among librarians and other content managers who have curatorial interests in the scholarly material produced by research institutions. **Institutional repositories offer a high-value, long-term vision, even though they remain works in progress.** The community must continue to collaborate on how best to build repositories by sharing information about advocacy, marketing, assessment, policies, business plans, technical architecture, system capabilities and a myriad of other issues that help universities understand how repositories might function most effectively.

Semantic Web

Digital Libraries use complex metadata of many types for a range of critical purposes in digital resource discovery, management, and preservation. For digital library systems to support this metadata, more flexible, extensible, and sophisticated technologies are needed than are currently widely available. The W3C's Semantic Web technology, building on the RDF metadata framework, shows promise for this problem, but requires further exploration to identify where and how this technology will be of most benefit. The MIT Libraries are collaborating on projects with the W3C and other Semantic Web research centers (HP Labs, MIT's CSAIL) to apply Semantic Web standards and tools to a range of real-world digital library metadata types and functionality. Successful experiments will be offered for deployment in the DSpace platform for broad use within the digital library community.

IV. Digital library publications, policies, working papers, and other documents

Publications

- Young, Jeffrey R. "5 Challenges for Open Source" The Chronicle of Higher Education 24, September 2004.
- Smith, MacKenzie. DSpace for E-Print Archives, CERN HEPL Webzine (2004).
- Bass, Mick; Tansley, Robert; Smith, MacKenzie. The DSpace™ Institutional Repository System: Status, Roadmap, Research, Governance, and Community Building. Proceedings of the ICDL, 2004.
- Smith, MacKenzie; Rodgers, Richard; Walker, Julie; Tansley, Robert. DSpace: a Year in the Life of an Open Source Digital Repository System. LNCS, September 2004.
- Smith, MacKenzie. VALA Conference Proceedings, Melbourne, Australia. January 2004.