TEACHING CHILDREN THINKING\textsuperscript{1,2}

Seymour Papert*

This report describes research done at the Artificial Intelligence Laboratory of the Massachusetts Institute of Technology. Support for the laboratory's education research is provided in part by the National Science Foundation under grant 6J-1049.

\textsuperscript{*}This paper is deeply influenced by Cynthia Solomon and Marvin Minsky.

\textsuperscript{1}Presented at the Proceedings of IFIPS World Congress on Computers and Education, Amsterdam, The Netherlands, 1970.

\textsuperscript{2}To be published in Mathematics Teaching (The Association of Teachers of Mathematics, Leicester, England: 1972).
The purpose of this essay is to present a grander vision of an educational system in which technology is used not in the form of machines for processing children but as something the child himself will earn to manipulate, to extend, to apply to projects, thereby gaining a greater and more articulate mastery of the world, a sense of the power of applied knowledge and a self-confidently realistic image of himself as an intellectual agent.
The computer revolution is a revolution in the way we think and in the way we express what we think.
Computational Thinking

It represents a universally applicable attitude and skill set everyone, not just computer scientists, would be eager to learn and use.

Computational thinking builds on the power and limits of computing processes, whether they are executed by a human or by a machine. Computational methods and models give us the courage to solve problems and design systems that no one of us would be capable of tackling alone. Computational thinking confronts the riddle of machine intelligence: What can humans do better than computers? and What can computers do better than humans? Most fundamentally it addresses the question: What is computable? Today, we know only parts of the answers to such questions.

Computational thinking is a fundamental skill for everyone, not just for computer scientists. To reading, writing, and arithmetic, we should add computational thinking to every child’s analytical ability.

Cisely. Stating the difficulty of a problem accounts for the underlying power of the machine—the computing device that will run the solution. We must consider the machine’s instruction set, its resource constraints, and its operating environment.

In solving a problem efficiently, we might further ask whether an approximate solution is good enough, whether we can use randomization to our advantage, and whether false positives or false negatives are allowed. Computational thinking is reformulating a seemingly difficult problem into one we know how to solve, perhaps by reduction, embedding, transformation, or simulation.

Computational thinking is thinking recursively. It is parallel processing. It is interpreting code as data and data as code. It is type checking as the generalization of dimensional analysis. It is recognizing both the virtues and the dangers of aliasing, or giving someone or something more than one name. It is recognizing both the cost and power of indirect
Computational Thinking

Hal Abelson
MIT
From Computational Thinking to Computational Values

Hal Abelson
MIT
Google's Ngram Viewer: A time machine for wordplay

by Lance Whitney | December 17, 2010 8:26 AM PST

Summary: You may never get through all 500 billion words from more than 5 million books over five centuries. But you can find out, for instance, that "smartphone" is a lot older than you think.
Quantitative Analysis of Culture Using Millions of Digitized Books

Jean-Baptiste Michel,1,2,3,4† Yuan Kui Shen,5 Aviva Presser Aiden,6 Adrian Veres,7 Matthew K. Gray,8 The Google Books Team,8 Joseph P. Pickett,9 Dale Hoiberg,10 Dan Clancy,8 Peter Norvig,8 Jon Orwant,8 Steven Pinker,4 Martin A. Nowak,1,11,12 Erez Lieberman Aiden1,12,13,14,15,10,†

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We constructed a corpus of digitized texts containing about 4% of all books ever printed. Analysis of this corpus enables us to investigate cultural trends quantitatively. We survey the vast terrain of "culturomics", focusing on linguistic and cultural phenomena that were reflected in the English language between 1800 and 2000. We show how this approach can provide insights about fields as diverse as lexicography, the evolution of grammar, collective memory, the adoption of technology, the pursuit of fame, censorship, and historical epidemiology. "Culturomics" extends the boundaries of rigorous quantitative inquiry to a wide array of new phenomena spanning the social sciences and the humanities.

custom equipment (7), and the text digitized using optical character recognition (OCR). Additional volumes – both physical and digital – were contributed by publishers. Metadata describing date and place of publication were provided by the libraries and publishers, and supplemented with bibliographic databases. Over 15 million books have been digitized [12% of all books ever published (7)]. We selected a subset of over 5 million books for analysis on the basis of the quality of their OCR and metadata (Fig. 1A) (7). Periodicals were excluded.

The resulting corpus contains over 500 billion words, in English (361 billion), French (45B), Spanish (45B), German (37B), Chinese (13B), Russian (35B), and Hebrew (2B). The oldest works were published in the 1500s. The early decades
Generative platforms
Researchers aim to chart intellectual trends in Arxiv

‘Culturomics’ team pivots from Google Books to scientific preprints.

Eric Hand
24 February 2012

When physicist Paul Ginsparg goes to next week’s American Physical Society meeting in Boston, Massachusetts, he plans to take with him a 64-gigabyte flash drive containing all 740,000 or so articles from Arxiv, the preprint repository he founded in 1991 that is managed by Cornell University in Ithaca, New York.

He will pass the data on to researchers from the Cultural Observatory at Harvard University in Cambridge, Massachusetts. They want to break down the full text of the articles into component phrases to see how often a particular word or phrase appears relative to others — a measure of how ‘meme-like’ a term is. Their goals: to give Arxiv a new tool for identifying original source papers in physics, mathematics and computer science — and to enable historians to spot trends from the 20 years that the repository has existed.

“How do you find the moment when a given scientific transformation occurred?” asks Jean-Baptiste Michel, co-director of the Cultural Observatory and a postdoctoral researcher in psychology at Harvard. “You can help the reader figure out where in time the most relevant papers were located, which has always been difficult to do.”
Learning
from the April 19, 2005 edition

When iPod goes collegiate

By Elizabeth Armstrong Moore | Correspondent of The
Christian Science Monitor

When Kenneth Rogerson walked into his newspaper journalism class on the first day of the school year, the professor could barely contain his excitement.

After a quick introduction he broke the big news: "We got the grant," he told his class. "You all get iPods."

As if on cue, the students exhaled an audible "whoa" and exchanged elated glances. Duke University in Durham, N.C., had already made many a headline as the first school ever to provide all incoming freshmen with their own 20-gigabyte iPods - enough space to store up to 5,000 songs.

Now, thanks to a grant program set up within Duke, some upperclassmen were overjoyed to also become recipients of the slim white gadgets.

But by this spring, the school had already announced its intention to...
"Do they have permission from the person who wrote the lectures to share it?" asks Alan Albright, managing principal and specialist in intellectual property litigation at the law firm of Fish & Richardson in Austin, Texas. "That would be the copyright concern…"

But all this collecting and dispersing raises red flags: First, how many words and how many students can be unwittingly and used for unknown purposes? And where is copyright being infringed? And how do professors and faculty make their own recordings?

Professors should be aware, Mr. Albright says, of how easy it is today for students to record lectures or any downloadable class materials and broadcast them over the Internet.

But not all professors or institutions are so free with their spoken intellectual property.

"Do they have permission from the person who wrote the lectures to share it?" asks Alan Albright, managing principal and specialist in intellectual property litigation at the law firm of Fish & Richardson in Austin, Texas. "That would be the copyright concern. The school wouldn't be liable anymore than Kmart is liable for selling me the iPod; giving me the storage capability isn't the bad thing. But I can't imagine, having been a student myself, that it wouldn't be widely abused."

This concern exists at any school where students have iPods, whether they were gifts or not. Professors should be aware, Mr. Albright says, of how easy it is today for students to record lectures or any downloadable class materials and broadcast them over the Internet.

But even as such discussions persist, it seems clear that iPods are in classrooms to stay.
RIAA Sues 22 Dorm Residents For Sharing Calculus Lectures

By Keith J. Weinstein

The record industry sued 22 MIT students for copyright infringement last Wednesday. All of the students — as yet unnamed — live in MIT dormitories and are accused of sharing copyrighted songs without permission on the Internet. MIT has already notified the students whose names may be released to the industry.

The lawsuits are part of the industry’s campaign, launched in 2003, of suing individual users of file-sharing software who publish songs for others to download without permission. So far, the industry has sued more than 6,000 people across the country — users of KaZaA, Grokster, LimeWire, and other programs.

This time, the record companies sued 405 users of the “i2hub” program at 18 colleges. The industry says it is suing the most flagrant individuals, but lawyers for the students say they are taking a risky gamble.

“We chose targets based on the egregiousness of the infringement,” wrote Cary Sherman, the president of the Recording Industry Association of America, in an online chat with college newspaper reporters last week. “The users sued today had an average of 2,300 MP3 files,” he wrote.

The record companies do not yet know whom they are suing. They have asked the federal district court in Boston for permission to send subpoenas to MIT to identify the owners of 22 computers that have shared copyrighted songs. The court is likely to grant permission in the next few weeks.

After MIT receives the subpoenas, the students identified will have 14 days to contest the release of their names. If a student does not challenge the subpoena in court, then MIT will send their names to the record companies who will amend their lawsuit to name the students as defendants.

The industry’s lawsuit names five IP addresses at Baker House, five at Simmons Hall, two each at Senior House, Burton Conner House, Edgerton House, and the west parallel of East Campus, as well as one user at MacGregor House, Next House, Tang Residence Hall, and on MIT’s remote access service.

The law entitles copyright owners to at least $750 for each song that is illegally copied. “But we routinely settle these cases at far less — on average in the $3,500–4,500 range — for those who work with us to resolve these cases quickly,” Sherman wrote.

The industry’s lawsuit against MIT students has become part of a larger existing case, London-Sire Records Inc. v. Does, No. 04-12434 (D. Mass. filed Nov. 18, 2004).

See page 22 for additional copy.
University of Southern California

As an academic institution, USC's purpose is to promote and foster the creation of intellectual property. It is antithetical to this purpose for USC to play any part, even inadvertently, in the violation of the intellectual property rights of others.

September 2002, letter to USC students from the Dean of Libraries
From Computational Thinking to Computational Values to Computational Actions

Hal Abelson
MIT
Site Highlights

- Syllabus
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  - 2237 active, others archived in MIT DSpace
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- 1018 course translations
- 345 mirror copies distributed on hard drives
- 66% of MIT faculty participating
MIT OCW distribution statistics for July 2013 - June 2014

- 56.3M visits by 34.7M unique visitors
- 274.7M page views
- 524K visits from within MIT
- 12.9M downloads on iTunes
- 33M views on YouTube
- 53% of traffic from outside North America
About The Open Education Consortium

The Open Education Consortium is a worldwide community of hundreds of higher education institutions and associated organizations committed to advancing open education and its impact on global education. We envision a world where everyone, everywhere has access to the education they need to build their futures. We seek to instill openness as a feature of education around the world, allowing greatly expanded access to education while providing a shared body of knowledge upon which innovative and effective approaches to today’s social problems can be built. The Open Education Consortium realizes change by leveraging its sources of expert opinion, its global network and its position as the principal voice of open education.

What is Open Education?

Open education encompasses resources, tools and practices that employ a framework of open sharing to improve educational access and effectiveness worldwide.

Open Education combines the traditions of knowledge sharing and creation with 21st century technology to create a vast pool of openly shared educational resources, while harnessing today’s collaborative spirit to develop educational approaches that are more responsive to learner’s needs.

The idea of free and open sharing in education is not new. In fact, sharing is probably the most basic characteristic of education: education is sharing knowledge, insights and information with others, upon which new knowledge, skills, ideas and understanding can be built. Open Education seeks to scale educational opportunities by taking advantage of the power of the internet, allowing rapid and essentially free dissemination, and enabling people around the world to access knowledge, connect and collaborate. Open is key: open allows not just access, but the ability to modify and use materials, information and networks so education can be personalized to individual users or woven together in new ways for large and diverse audiences.
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  - September 9, 2014

- **The Civil War and Reconstruction - 1850-1877**
  - ColumbiaX | HIST1.1x
  - September 17, 2014

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  - RiceX | BIOC372.1x
  - August 18, 2014
Open Educational Resources

Open Educational Resources (OER) are high-quality, openly licensed, online educational materials that offer an extraordinary opportunity for people everywhere to share, use, and reuse knowledge. They also demonstrate great potential as a mechanism for instructional innovation as networks of teachers and learners share best practices.

Since 2002, the Hewlett Foundation has worked with OER grantees to improve education globally by making high-quality academic materials openly available on the Internet. The Education Program continues to work toward establishing a self-sustaining and adaptive global OER ecosystem and demonstrating its potential to improve teaching and learning.
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DSpace@MIT is a growing collection of MIT’s research that includes peer-reviewed articles, technical reports, working papers, theses and more. End-user downloads of the 70,000+ items regularly exceed one million per month.

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- Department of Humanities
- Department of Interdisciplinary Science
Browsing Al Memos (1959 - 2004) by Author "Papert, Seymour"

1968-1969 Progress Report
Minsky, Marvin; Papert, Seymour (1970-01-01)
This report mainly summarizes the Project MAC A.I. Group work between July 1968 and June 1969 but covers some work up to February 1970. The work on computer vision is described in detail. This summary should be read ...

Artificial Intelligence, Language and the Study of Knowledge
Goldstein, Ira; Papert, Seymour (1975-07-01)
This paper studies the relationship of Artificial Intelligence to the study of language and the representation of the underlying knowledge which supports the comprehension process. It develops the view that intelligence ...

The Artificial Intelligence of Hubert L. Dreyfus: A Budget of Fallacies
Papert, Seymour (1968-01-01)
In December 1965 a paper by Hubert Dreyfus revived the old game of generating curious arguments for and against Artificial Intelligence. Dreyfus hit top form in September 1967 with an explanation in the Review of ...

Artificial Intelligence Progress Report
Minsky, Marvin; Papert, Seymour (1972-01-01)
1968-1969 Progress Report

Author: Minsky, Marvin; Papert, Seymour

Citable URI: http://hdl.handle.net/1721.1/6701
Date Issued: 1970-01-01
Abstract:
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• DSpace vision: Universal access to the collective intellectual resources of the world’s great research institutions.
WHY?
Why should universities support Open Educational Resources and Institutional Repositories?
Why should universities support Open Educational Resources and Institutional Repositories?

Without initiatives like these, traditional academic values will be increasingly marginalized, and university communities will be increasingly stressed.
Many students probably create a work that would infringe a faculty member's copyright, that is, they base their notes on and incorporate her particular expression rather than just state facts and ideas she articulates in more detail. Faculty members have always permitted this kind of activity without actually talking about it. They “implicitly” license students to create a “derivative work” from the lecture. The license is implied through academic tradition -- students are expected to take notes. …

Now faculty may wish to make the implied license explicit and add some restrictions.

A limited license to take notes could be very important to protecting the intellectual content of lecture materials …

University of Texas, Office of the General Counsel, August 2001
The suggested license …

Written and verbal instructions at the beginning of class could look something like this:

*My lectures are protected by state common law and federal copyright law. They are my own original expression and I record them at the same time that I deliver them in order to secure protection. Whereas you are authorized to take notes in class thereby creating a derivative work from my lecture, the authorization extends only to making one set of notes for your own personal use and no other use. You are not authorized to record my lectures, to provide your notes to anyone else or to make any commercial use of them without express prior permission from me.*

University of Texas, Office of the General Counsel, August 2001
Conflating “freedom of inquiry” with “freedom of property”

Intellectual property law … embodies the notion that the only forms of cultural work that can be “protected” are those that can be owned. …

… the conflation of property rights and “academic rights” participates in a set of discourses … in which freedom can only be understood to mean “individual free enterprise.”

In retelling this tale academics risk losing a language for talking about knowledge as other than private property and the university as other than economically “useful.”

Why should universities support Open Educational Resources and Institutional Repositories?

- Without initiatives like these, traditional academic values will be increasingly marginalized, and university communities will be increasingly stressed.
Why should universities support Open Educational Resources and Institutional Repositories?

• Without initiatives like these, traditional academic values will be increasingly marginalized, and university communities will be increasingly stressed.

• To keep a seat at the table in decisions about the disposition of knowledge in the information age.
Scientific literature as property: The basic deal

- Scientist authors give their property away to the journal publishers.
- Publishers own this property and all rights to it forever, and they magnanimously allow the scientist author to retain some limited rights that are determined at the publisher’s sole discretion.
- The university generally gets no specific rights.
- And the public doesn’t enter into this deal at all.
Copyright Transfer

COPYRIGHT is a bundle of 5 rights:

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• Reuse in publications:
  – For noncommercial publication, author may reuse figures and tables, and up to 250 words of text
Academic publishing

No peeking...

A publishing giant goes after the authors of its journals’ papers

Jan 11th 2014 | From the print edition

ONCE upon a time, it was common for scientists to receive letters from researchers working in other institutions, asking for reprints of papers they had published. It was the usual practice in those days for journal publishers to furnish authors with a couple of dozen such reprints, precisely for this purpose—but, if these had run out, a quick visit to the photocopier kept the wheels of scientific discourse turning, and though it was technically a violation of copyright, no one much minded.

Then, the world wide web was invented—initially, as it happens, with the intention of making it easier for scientists to share their results—and everything changed. Now, any scientist worth his grant has a website, and that site will often let the casual visitor download copies of its owner’s work. And, though it has taken a while, some publishers have decided they do mind about this—indeed one, Elsevier, based in the Netherlands, has been fighting back. It is using the Digital Millennium Copyright Act (DMCA), an American law that lets copyright holders demand the removal of anything posted online without their permission, to require individual scientists to eliminate from their websites papers published in its journals. In doing so it has stirred a hornets’ nest.
[Elsevier] is using the Digital Millennium Copyright Act (DMCA), an American law that lets copyright holders demand the removal of anything posted online without their permission, to require individual scientists to eliminate from their websites papers published in its journals.
Elsevier Takedown Notices for Faculty Articles on UC Sites

Elsevier recently sent DMCA (Digital Millennium Copyright Act) takedown notices to some UC campuses, claiming that the availability of certain Elsevier journal articles posted on university websites infringes Elsevier copyrights.

UC faculty might be wondering, what does this mean for me? Am I at risk of receiving a takedown notice and, if so, what should I do?

- At this point, the takedown action only applies to local campus web pages like department sites, faculty profiles, or lab pages. This action does not currently apply to any content you may have posted to UC’s eScholarship Repository. Read a recent article in the Washington Post on Elsevier’s takedown notice campaign. Elsevier has also been in the news for similar notices sent to academia.edu, a for-profit article sharing site.

- If you have not been notified by someone on your campus (e.g., a campus DMCA agent, someone in IT, etc.), your site is not currently the target of a takedown notice.

Additional information:

What right does Elsevier have to tell faculty they can’t post their own work?

If you published with an Elsevier journal, you probably signed a copyright agreement. If you did, Elsevier is exercising the legal right you gave them to control access to your article.

I can’t find the agreement I signed with Elsevier. What did it say?

It may vary a little depending on the journal, but the agreement probably transferred copyright ownership to the publisher, and had a list of things you could still do with the article. Posting the published version on a website where anyone can read it was probably not allowed. You can request a copy from the publisher or your editor if you unable to locate your copy.

I thought self archiving was fine. Don’t we have an open access policy now?
Performing Advanced Indexing, Analysis Prohibited

• “Subscriber may not use routines designed to continuously and automatically search and index the service” (Springer)
• “automated searches against ProQuest's systems are not permitted. ... Data mining is prohibited.”
From Elsevier’s license to libraries

- Except as expressly stated in this Agreement or otherwise permitted in writing by Elsevier, the Subscriber and its Authorized Users may not:
  - use any robots, spiders, crawlers or other automated downloading programs, algorithms or devices to continuously and automatically search, scrape, extract, deep link, index or disrupt the working of the Subscribed Products;
SCIENCE DIRECT

Description

SciVerse ScienceDirect: discovery via full-text content

ScienceDirect is SciVerse's leading full-text scientific database offering science, medical and technical (STM) journal articles and book chapters from more than 2,500 peer-reviewed journals and over 11,000 books. There are currently more than 10 million articles/chapters, a content base that is growing at a rate of almost 0.5 million additions per year with archives that reach as far back as 1823.

SciVerse ScienceDirect also offers sophisticated search and retrieval tools and integrated external sources that enable users to maximize the effectiveness of their knowledge discovery process. Built to save time and streamline research, these functions facilitate more efficient work flows to accelerate scientific discovery.

To discuss the benefits ScienceDirect can offer your institute, contact your nearest Elsevier Regional Sales Office.

Last update: 9 Jun 2011
In other words ...
In other words.

We are moving towards private monopoly control of the scholarly record.
STM Commercial Journal Publisher Consolidation

1998: 8 Key Players

Elsevier ($995M)


Wiley ($1,235M)

Acquired: Blackwell

Blackwell ($657M) (1996)

Plenum ($53M) (1997)

Kluwer ($198M)

Springer ($170M)

Acquired: Plenum, Kluwer, Humanar

Academic ($192M)

T & F ($61M)

2008: 4 Key Players

Elsevier ($9,168M)


Springer ($1,334M)

Acquired: Plenum, Kluwer, Humanar

Taylor & Francis ($2,274M)

Acquired: CRC Press, Routledge; merged with informa

Wiley ($1,235M)

Acquired: Blackwell

(Shown very roughly to scale)
MIT Libraries Materials Purchases vs. CPI % Increase
1986-2009

NOTE: # serials purchased % change data to 2011; CPI % change to 2010
How can it be that this system persists?

- The journal publication is structured as a copyright negotiation between publishers and individual faculty authors.
- To prompt a move back toward balance, the faculty must play a role as a collective body, not just as individuals.
Mathematicians Organize Boycott of a Publisher

By THOMAS LIN
Published: February 13, 2012

More than 5,700 researchers have joined a boycott of Elsevier, a leading publisher of science journals, in a growing furor over open access to the fruits of scientific research.

The protest grew out of a provocative blog post by the mathematician Timothy Gowers of Cambridge University, who announced on Jan. 21 that he would no longer publish papers in any of Elsevier’s journals or serve as a referee or editor for them.

Last week 34 mathematicians issued a statement denouncing “a system in which commercial publishers make profits based on the free labor of mathematicians and subscription fees from their institutions’ libraries, for a service that has become largely unnecessary.”

The signers included three Fields medalists — Dr. Gowers, Terence Tao and Wendelin Werner. The statement was also signed by Ingrid Daubechies, president of the International Mathematical Union, who then resigned as one of the unpaid editors in chief at the Elsevier journal Applied and Computational Harmonic Analysis.
Why scientists are boycotting a publisher

By Gareth Cook | FEBRUARY 12, 2012

THE SCIENTIFIC community finds itself at the beginning of its own Arab Spring. At stake are values that all Americans hold dear: the free flow of information and the continued betterment of human life. Success is by no means guaranteed, but it’s an important protest movement in which Boston should play a special role.

The central character in this emerging drama may seem an unlikely villain: Elsevier, an Amsterdam-based publisher of scientific journals, including the prestigious titles Cell and Lancet, which give researchers a platform to share their most important advances.

But Elsevier has settled on a business strategy of exploitation, aligning itself against the interests of the scientific community. Most of the intellectual work that goes into Elsevier’s journals is provided for free, by scientists whose salaries are largely paid for by taxpayers. Then Elsevier charges exorbitant rates for its journals, with many titles running in the thousands of dollars a year. This sharply curtails the sharing of results - the fuel of scientific discovery - and makes it prohibitively expensive for the public to read what appears in its pages. Yet for Elsevier, this looks like success: In 2010 Elsevier reported revenues of about $3.2 billion, of which a whopping 36 percent were profit.
The Cost of Knowledge

14735 Researchers Taking a Stand. See the list

Academics have protested against Elsevier's business practices for years with little effect. These are some of their objections:

1. They charge exorbitantly high prices for subscriptions to individual journals.
2. In the light of these high prices, the only realistic option for many libraries is to agree to buy very large "bundles", which will include many journals that those libraries do not actually want. Elsevier thus makes huge profits by exploiting the fact that some of their journals are essential.
3. They support measures such as SOPA, PIPA and the Research Works Act, that aim to restrict the free exchange of information.

The key to all these issues is the right of authors to achieve easily-accessible distribution of their work. If you would like to declare publicly that you will not support any Elsevier journal unless they radically change how they operate, then you can do so by filling in your details on this page.

More information:
- Statement of Purpose
- Polymath journal publishing reform page

Read our blog, and follow the boycott on Twitter here.

14735 people from All Subjects have signed.
The Faculty of the Massachusetts Institute of Technology is committed to disseminating the fruits of its research and scholarship as widely as possible.
Each faculty member grants to MIT nonexclusive permission to make available his or her scholarly articles for the purpose of open dissemination.
“The vote is a signal to the world that we speak in a unified voice; that what we value is the free flow of ideas.”

--Bish Sanyal

Chair of the MIT Faculty at time of Vote on MIT Faculty Open Access Policy & the Ford International Professor of Urban Development & Planning
Institutional open access mandates
roarmap.eprints.org
MIT Open Access Policy

Open Access Articles Collection
Growth in Total Articles: 10/2009 - 6/2014
MIT Open Access Policy
March 2009 – June 2014

- Downloads: 2.1 M
- Papers included: 15,852
- Includes 39% of faculty papers

Sources
  - mining publisher web sites 44%
  - requests to authors 18%
  - MIT sites 19%
  - other repositories 16%

- 1238 waivers requested -- 4.6% of articles, only reason for request was publisher requirement
The battles over openness
Authors' Rights & Responsibilities

At Elsevier, we are dedicated to protecting your rights as an author, and ensuring that any and all legal information and copyright regulations are addressed.

Whether an author is published with Elsevier or any other publisher, we hold ourselves and our colleagues to the highest standards of ethics, responsibility and legal obligation.

As a journal author, you retain rights for a large range of author uses of your article, including use by your employing institute or company. These rights are retained and permitted without the need to obtain specific permission from Elsevier.

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Intellectual property, in particular copyright (rights in editorial content), trademarks (rights in brands for services or journals), and database rights (rights in compilations of information), form the foundation of Elsevier's publishing services and communications businesses. We in Elsevier embrace the opportunities the digital environment offers for communication and access, while at the same time we recognize the new risks that this environment poses, that being the case with which unauthorized copies can be made and distributed worldwide. For more information, see: [Download your practical guide to Elsevier's copyright policy](https://www.elsevier.com/author-center/permissions)

**Our objective**

We aim to manage digital rights and brands amidst the structural changes that the "information society" represents, while at the same time recognizing the shared goals we have with our customers and authors. These include providing the widest possible distribution of scientific and medical content and services in a financially sustainable business model.

Elsevier wants to ensure a proper balance between the scholarly rights which authors retain (or are granted/transferred back in some cases) and the rights granted to Elsevier that are necessary to support our mix of business models. We routinely analyse and modify our policies to ensure we are responding to authors' needs and concerns, and to the concerns in general of the research and scholarly communities.

**What rights do I retain as a journal author?**

- the right to make copies (print or electronic) of the journal article for your own personal use, including for your own classroom teaching use;
- the right to make copies and distribute copies of the journal article (including via e-mail) to research colleagues, for personal use by such colleagues for scholarly purposes*;
- the right to post a pre-print version of the journal article on Internet websites including electronic pre-print servers, and to retain indefinitely such version on such servers or sites for scholarly purposes.

*Please consult the author guidelines for specific details.

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**Related Links**

- [SciVerse ScienceDirect](https://www.sciencedirect.com)
  - Access peer-reviewed full-text articles through SciVerse ScienceDirect.
- [Elsevier Author WebShop](https://www.elsevier.com/author-center)
  - Language editing and illustration services for your manuscripts, personal reprints, Personal Selections for iPads and more.
The right to post a revised personal version of the text of on your personal or institutional website.
The right to post a revised personal version of the text of on your personal or institutional website * (but not in subject-oriented or centralized repositories or institutional repositories with mandates for systematic postings unless there is a specific agreement with the publisher) [added in 2010]
Research Works Act Could Challenge Public Access to Federally Funded Research
by Robin Peek
Posted On January 17, 2012

H.R. 3699, the Research Works Act, was introduced Dec. 23, 2011, by Rep. Darrell Issa (R-Calif.), chairman of the Committee on Oversight and Government Reform, and committee member Rep. Carolyn Maloney (D-NY). According to the Association of American Publishers (AAP) website, “The legislation is aimed at preventing regulatory interference with private-sector research publishers in the production, peer review and publication of scientific, medical, technical, humanities, legal and scholarly journal articles.” Put another way, it is designed to thwart activities such as the National Institutes of Health (NIH) Public Access Policy, which requires scientists to submit final peer-reviewed journal manuscripts that arise from NIH funds to the digital archive PubMed Central upon acceptance for publication.

The bill is, as noted by the AAP in its press release, “significant legislation that will help reinforce America’s leadership in scholarly and scientific publishing in the public interest and in the critical peer-review system that safeguards the quality of such research.” The argument, an old one at that, is that publishers add value to journal content and requiring them to provide free access denies them revenues. The big ticket players in this game are journals such as Cell, Science, and Nature.

Specifically, according to Section 2. Limitation on Federal Agency Action. “No Federal agency may adopt, implement, maintain, continue, or otherwise engage in any policy, program, or other activity that—(1) causes, permits, or authorizes network dissemination of any private-sector research work without the prior consent of the publisher of such work; or (2) requires that any actual or prospective author, or the employer of such an actual or prospective author, assent to network dissemination of a private-sector research work.”

As noted on the AAP website, “The Research Works Act will prohibit federal agencies from unauthorized free public dissemination of journal articles that report on research which, to some degree, has been federally-funded but is produced and published by private sector publishers receiving no such funding. It would also prevent non-governmental authors from being required to agree to such free distribution of these works.”

The Copyright Alliance, a group that includes large media organizations such as the Recording Industry of America and Reed Elsevier, Carolyn Maloney (D-NY) for their bipartisan introduction of H.R. 3699, the Research Works Act. The proposal would overturn an unproven statute, proposed by certain authors and researchers.” according to Copyright Alliance executive director Sandra Aistars. “This reversal of centuries of copyright laws and case law would have the effect of turning some of the most deserving authors and researchers into criminals.”

The point about not having input into these congressional committees is wholly incorrect. As a long time columnist on the subject of copyright, I had exceptional opportunities to influence copyright decision makers directly. This is an old issue that the Copyright Alliance is hoping to open and debated at length when the NIH policy was passed in 2008. I covered this extensively in Information Today as did others in different publications.

At the time of this writing, six members of the AAP—MIT Press, the Council on Library and Information Resources (CLIR), ITHAKA, Peter Lang University Press, and the University of California Press—have publicly disavowed this bill. Other organizations, such as the Special Libraries Association, have also come out against it. An online petition site to stop the Research Works Act has also been set up.

“I want to state emphatically that I support the NIH Public Access Policy and think it should be expanded to other federal funding agencies.” Rockefeller University Press in a public letter. “All publishers of biomedical research understand several truths: 1) that their content is public domain; 2) that the peer review process is carried out in large part by federally funded individuals, and 3) that a significant portion of their support comes from institutions. Although publishers’ content may technically be considered ‘private-sector research work’ as described in the text of H.R. 3699, the content is truly the public’s.”
H. R. 3699

To ensure the continued publication and integrity of peer-reviewed research works by the private sector.

IN THE HOUSE OF REPRESENTATIVES

DECEMBER 16, 2011

Mr. Issa (for himself and Mrs. Maloney) introduced the following bill, which was referred to the Committee on Oversight and Government Reform

A BILL

To ensure the continued publication and integrity of peer-reviewed research works by the private sector.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the “Research Works Act”.

SEC. 2. LIMITATION ON FEDERAL AGENCY ACTION.

No Federal agency may adopt, implement, maintain, continue, or otherwise engage in any policy, program, or other activity that—

(1) causes, permits, or authorizes network dissemination of any private-sector research work with-
Elsevier, along with other publishers and publishing Trade Associations, lobbied for the bill to be introduced ... We don’t believe that the government should tell authors and publishers what we can do with our publications.

Alicia Wise
Director of Universal Access at Elsevier
Feb. 8, 2012
ELSEVIER WITHDRAWS SUPPORT FOR THE RESEARCH WORKS ACT

At Elsevier, we have always focused on serving the global research community and ensuring the best possible access to research publications and data. In recent weeks, our support for the Research Works Act has caused some in the community to question that commitment.

We have heard expressions of support from publishers and scholarly societies for the principle behind the legislation. However, we have also heard from some Elsevier journal authors, editors and reviewers who were concerned that the Act seemed inconsistent with Elsevier’s long-standing support for expanding options for free and low-cost public access to scholarly literature. That was certainly not our intention in supporting it. This perception runs counter to our commitment to making published research widely accessible, coming at a time when we continue to expand our access options for authors and develop advanced technologies to enable the sharing and distribution of research results.

We welcome indications that key research funders are more willing to talk to publishers to explore collaborative approaches. This is a good sign because we firmly believe that more cooperation and partnership between funders and publishers is the best way to expand free public access.

While we continue to oppose government mandates in this area, Elsevier is withdrawing support for the Research Work Act itself. We hope this will address some of the concerns expressed and help create a less heated and more productive climate for our ongoing discussions with research funders.

Cooperation and collaboration are critical because different kinds of journals in different fields have different economics and models. Inflexible mandates that do not take those differences into account and do not involve the publisher in decision making can undermine the peer-reviewed journals that serve an essential purpose in the research community. Therefore, while withdrawing support for the Research Works Act, we will continue to join with those many other nonprofit and commercial publishers and scholarly societies that oppose repeated efforts to extend mandates through legislation.

We are ready and willing to work constructively and cooperatively to continue to promote free and low-cost public access through a variety of means, as we have with research funders and other partners around the world.

Publication date: 27 February 2012
MEMORANDUM FOR THE HEADS OF EXECUTIVE DEPARTMENTS AND AGENCIES

FROM: John P. Holdren
Director

SUBJECT: Increasing Access to the Results of Federally Funded Scientific Research

1. Policy Principles

The Administration is committed to ensuring that, to the greatest extent and with the fewest constraints possible and consistent with law and the objectives set out below, the direct results of federally funded scientific research are made available to and useful for the public, industry, and the scientific community. Such results include peer-reviewed publications and digital data.

Scientific research supported by the Federal Government catalyzes innovative breakthroughs that drive our economy. The results of that research become the grist for new insights and are assets for progress in areas such as health, energy, the environment, agriculture, and national security.
The Office of Science and Technology Policy (OSTP) hereby directs each Federal agency with over $100 million in annual conduct of research and development expenditures to develop a plan to support increased public access to the results of research funded by the Federal Government.

Scientific research supported by the Federal Government catalyzes innovative breakthroughs that drive our economy. The results of that research become the grist for new insights and are assets for progress in areas such as health, energy, the environment, agriculture, and national security.
MEMORANDUM FOR THE HEADS OF EXECUTIVE DEPARTMENTS AND AGENCIES

Ensure that the public can read, download, and analyze in digital form final peer-reviewed manuscripts or final published documents within a timeframe that is appropriate for each type of research conducted or sponsored by the agency.
Publishers Offer CHORUS as Solution to Federal Open Access Requirements

By Meredith Schwartz on June 6, 2013

The Association of American Publishers (AAP) has put forward its bid for a coalition of publishers to handle many of the requirements outlined in the recent Office of Science and Technology Policy (OSTP) memo requiring open access to federally funded research, in the form of the Clearinghouse for the Open Research of the United States (CHORUS). The publishers are in discussions with OSTP, the funding agencies, universities and research library communities (as are other proposed solutions by other stakeholders, not yet announced). CHORUS plans to “work out the system architecture and technical specifications over the summer and have an initial proof of concept completed by August 30.”

Publishers have offered to cover the costs for implementing CHORUS, but Joseph W. Serene, Treasurer/Publisher of the American Physical Society (APS), doesn’t think that will be a heavy burden. He told LJ, “most of the things that are on [the memo’s list of requirements], we can provide at very little marginal expense.”
The SHared Access Research Ecosystem (SHARE) is a higher education and research community initiative to ensure the preservation of, access to, and reuse of research outputs. SHARE will develop solutions that capitalize on the compelling interest shared by researchers, libraries, universities, funding agencies, and other key stakeholders to maximize research impact, today and in the future. SHARE aims to make the inventory of research assets more discoverable and more accessible, and to enable the research community to build upon these assets in creative and productive ways.

The Association of Research Libraries (ARL), the Association of American Universities (AAU), and the Association of Public and Land-grant Universities (APLU) have partnered to develop SHARE with significant input from the three associations’ member institutions and their broader stakeholder communities. Management of SHARE is overseen by a steering group drawing from the leadership and membership of ARL, AAU, and APLU.

ARL, AAU, and APLU strongly believe that ensuring broad and continuing access to research is central to the mission of higher education. Research publications, research data, other research outputs, along with their associated metadata, should be publicly accessible and available for reuse, text mining, data mining, and machine reading. This accelerates further research and discovery.

The higher education community also has the responsibility to collect and preserve their researchers’ scholarly output for reasons beyond ensuring access, such as for institutional planning and for analytic purposes.
Generative platforms
Generative technologies: Technologies like personal computers that have the capacity to produce unprompted, user-driven change.
Zittrain in Technology Review: The personal computer is dead

November 30, 2011

The following op-ed by Harvard Law School Professor Jonathan Zittrain appeared in the Nov. 30 edition of the Technology Review. [Click here for audio.]

In addition to his HLS professorship, Zittrain is faculty co-director of the Berkman Center for Internet and Society at Harvard University. He is also a professor of law at the Harvard Kennedy School, and professor of computer science at the Harvard School of Engineering and Applied Sciences.

Zittrain is the author of the 2008 book *The Future of the Internet—And How To Stop It.*

The personal computer is dead

by Jonathan Zittrain

The PC is dead. Rising numbers of mobile, lightweight, cloud-centric devices don’t merely represent a change in form factor. Rather, we’re seeing an unprecedented shift of power from end users and software developers on the one hand, to operating system vendors on the other—and even those who keep their PCs are being swept along. This is a little for the better, and much for the worse.
If we allow ourselves to be lulled into satisfaction with walled gardens, we'll miss out on innovations to which the gardeners object, and we'll set ourselves up for censorship of code and content that was previously impossible.
Over 500,000 apps. For work, play, and everything in between.

The apps that come with your iPhone are just the beginning. Browse the App Store to find hundreds of thousands more. The more apps you download, the more you realize there's almost no limit to what your iPhone can do.

Learn more about the App Store ›
Network effects lead to Monopoly positions Lead to Concentration of channels Lead to Decline of generativity
From Computational Thinking to Computational Values
From Computational Thinking to Computational Values

Will our students’ computing platforms be generative? Will students be able to tinker with them?
Apple Rejects Kid-Friendly Programming App

By Brian X. Chen  
April 20, 2010 | 2:15 pm | Categories: Media Players

510 people like this. Be the first of your friends.
Create and share your own interactive stories, games, music, and art

Check out the 2,334,269 projects from around the world!

To create your own projects:

Download Scratch

Featured Projects

Map-It
by UnprovenTheorem

Launch your own...
by sennisnuet

Valentine's Day...
by Joannfarc

Collab Camp
Collaborate with other Scratchers at Collab Camp to create music mashups.

Learn more

Scratch Day
Be a part of Scratch Day - a worldwide network of gatherings, where Scratchers come together to meet, share, and learn.

Find out more

Projects Selected by CylonToast

Admiral Ackbar
by gub!

The Good Left...
by MaxFlyboy

Snake Glow
by joicote

Projects from Scratch Design Studio

See more

Find out more

ScratchEd
Do you help people learn Scratch? Join ScratchEd, our new online community for educators.

Find out more
From Computational Thinking to Computational Values

Will our students’ computing platforms be generative? Will students be able to tinker with them?
From Computational Thinking to Computational Values

Will our students’ computing platforms be generative? Will students be able to tinker with them?

Will mobile computing be tinkerable?
Get Started
Follow these simple steps to build your first app.

Start

Tutorials
Step-by-step guides show you how to build all kinds of apps.

Tutorials

Teach
Teachers, find out about curriculum and teaching resources.

Teach

Forums
Join community forums to get answers to your questions.

Forums
Designer: choose components for your app
Blocks View: program connections between components
What is MIT App Inventor?

Creating an App Inventor app begins in your browser, where you design how the app will look. Then, like fitting together puzzle pieces, you set your app's behavior. All the while, through a live connection between your computer and your phone, your app appears on your phone.

You can build many different types of apps with App Inventor. Often people begin by building games like MoleMash or games that let you draw funny pictures on your friend's faces. You can even make use of the phone's sensors to move a ball through a maze based on tilting the phone.

But app building is not limited to simple games. You can also build apps that inform and educate. You can create a quiz app to help you and your classmates study for a test. With Android's text-to-speech capabilities, you can even have the phone ask the questions aloud.

To use App Inventor, you do not need to be a professional developer. This is because instead of writing code, you visually design the way the app looks and use blocks to specify the app's behavior.

MIT App Inventor is almost ready!

* If you are not already a tester of the experimental instance of MIT App Inventor, please read the blog post about applying to be a tester.
Text for Button1
Hello Purr

Text for Button1
When Button1.Click:

do:

Play the media. If it was previously paused, the playing is resumed.
when Button1.Click
do Call Player1.Start
App Inventor today

- **free public service** at appinventor.mit.edu (uses GAE and GCE)

- Open source, with code publicly available on GitHub

- MIT server stats (**May 2014**)
  - 87K weekly active users
  - 1.9M total registered users
  - 195 countries
  - 4.7M apps started
  - 31,500 App Inventor apps on Google Play
App Inventor in Schools

AP CS Principles course: Hartford and Birmingham implementing App Inventor based CS Principles courses

Introductory undergraduate courses in many universities

Pre-service and in-service teacher professional development courses

UK nationwide curriculum—one of three modules in a new CS curriculum for middle and high school

Verizon Innovative App Challenge: winning schools receiving hands-on App Inventor training
High School girls “Tag It” app for community cleanup

Find a location that needs to be cleaned up. Take a picture and tag it. Create an event to get it cleaned.
Science Apps in the Field: Measuring Tree Height

Student ID: jgourl
Height (m): 1.92
Stride (m): 1.7

Tree ID: 613
Tree Type: Columnar Sugar Maple
Circumference (cm): 25
Distance (paces): 51

Calculate Height
Upload All Data

http://notes.hfoss.org/index.php/TreeCalc:Main_Page
Developed by three college students, the ComPal App uses the phone’s camera to perform analysis of medical tests in places where regular medical care is not readily available.
Science Apps in the Field: Tracking Wild Hogs
Apps for Social and Humanitarian Good

After Hurricanes devastated Haiti, residents were faced with long lines to receive aid. Volunteers recorded distributions with paper/pen.

Using App Inventor, Haiti relief workers developed an app to facilitate distribution of food and water by tracking items in a centralized database.
Apps to Aid Law Enforcement

Five high-school girls in Lagos, Nigeria created an app to help local traffic police.

Rather than chasing after the offender, the officer submits information to a shared database.

The team was a winner of the International Telecommunications Union “Tech Needs Girls” award.

They were honored at a reception hosted by Nigeria’s first lady at the presidential villa, and an award presentation at the European Parliament in Brussels.
Apps for Parents

Track your child on bus rides to and from school.

Created by an eighth-grader in India.

Bar code scanner for checking students on and off the bus.

GPS to get bus location.

Informs parents by sending SMS messages.

App has two modules, one for parents and one for students.
DroidBall: App Inventor robot controllers

Monash University Sunway Campus, Malaysia, Intelligent System Boot Camp takes high school students from beginner to robot programmer in two days.
Thank you
END