DECEMBER 11, 2018

Building Community and Support for Open Science at Carnegie Mellon University – A Conference Report

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Carnegie Mellon University

@cmkeithw @HuajinBioLib

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" 2. BIRMINGHAM STATION. PANHANDLE R.R.
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" 6. POST OFFICE.
" 7. EXPOSITION BUILDINGS.
" 8. FORT PITT BLOCKHOUSE

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PENNSYLVANIA.

1902.

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Carnegie Mellon

We do not do everything, but at what we do we aim to be the best in the world.

#1 SCHOOL OF COMPUTER SCIENCE
U.S. News & World Report, 2014

#1 TIME-BASED/ NEW MEDIA
U.S. News & World Report, 2016

#1 INFORMATION & TECHNOLOGY MANAGEMENT
U.S. News & World Report, 2016

#2 SCHOOL OF DRAMA
The Hollywood Reporter, 2017

#5 COLLEGE OF ENGINEERING
U.S. News & World Report, 2017

#10 BEST FOR NEW HIRES[1]
Wall Street Journal, 2010

#17 AMONG U.S. UNIVERSITIES
Times Higher Education of London, 2017-18

#24 UNIVERSITY IN THE WORLD
Times Higher Education of London, 2017-18

49.8% OF COMPUTER SCIENCE'S FIRST-YEAR STUDENTS WERE WOMEN IN 2017
Nearly triple the national average

56 MEMBERS OF NAE[2]

17 MEMBERS OF NAS[3]

5 MEMBERS OF NAM[4]

44 TONY AWARDS

10 ACADEMY AWARDS

116 EMMY AWARDS

12 TURING AWARDS

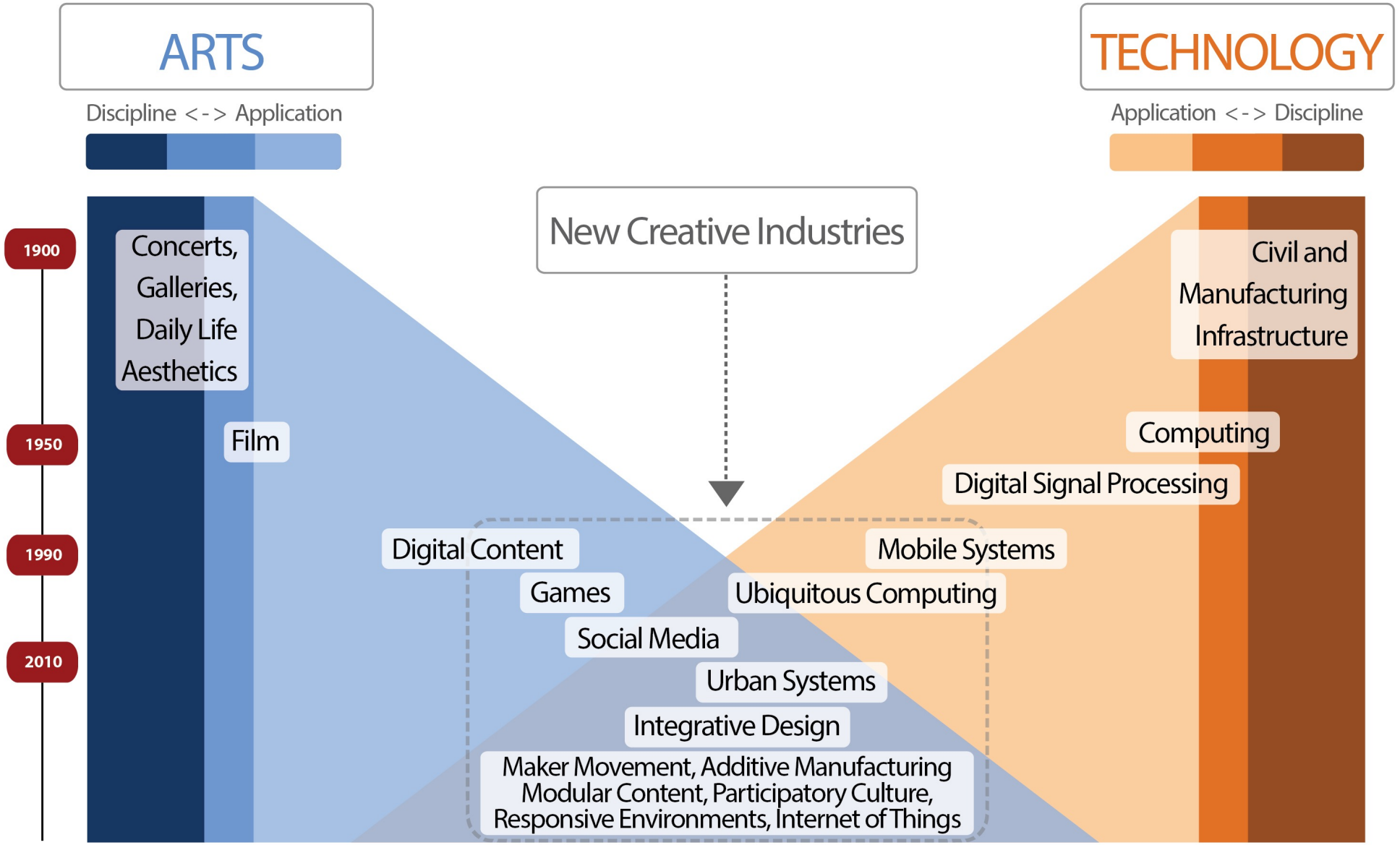
20 NOBEL LAUREATES

▲ *Won by alumni and current/former faculty*

[2] *National Academy of Engineering*

[3] *National Academy of Sciences*

[4] *National Academy of Medicine*


ARTS
Discipline <-> Application
TECHNOLOGY
Application <-> Discipline
New Creative Industries
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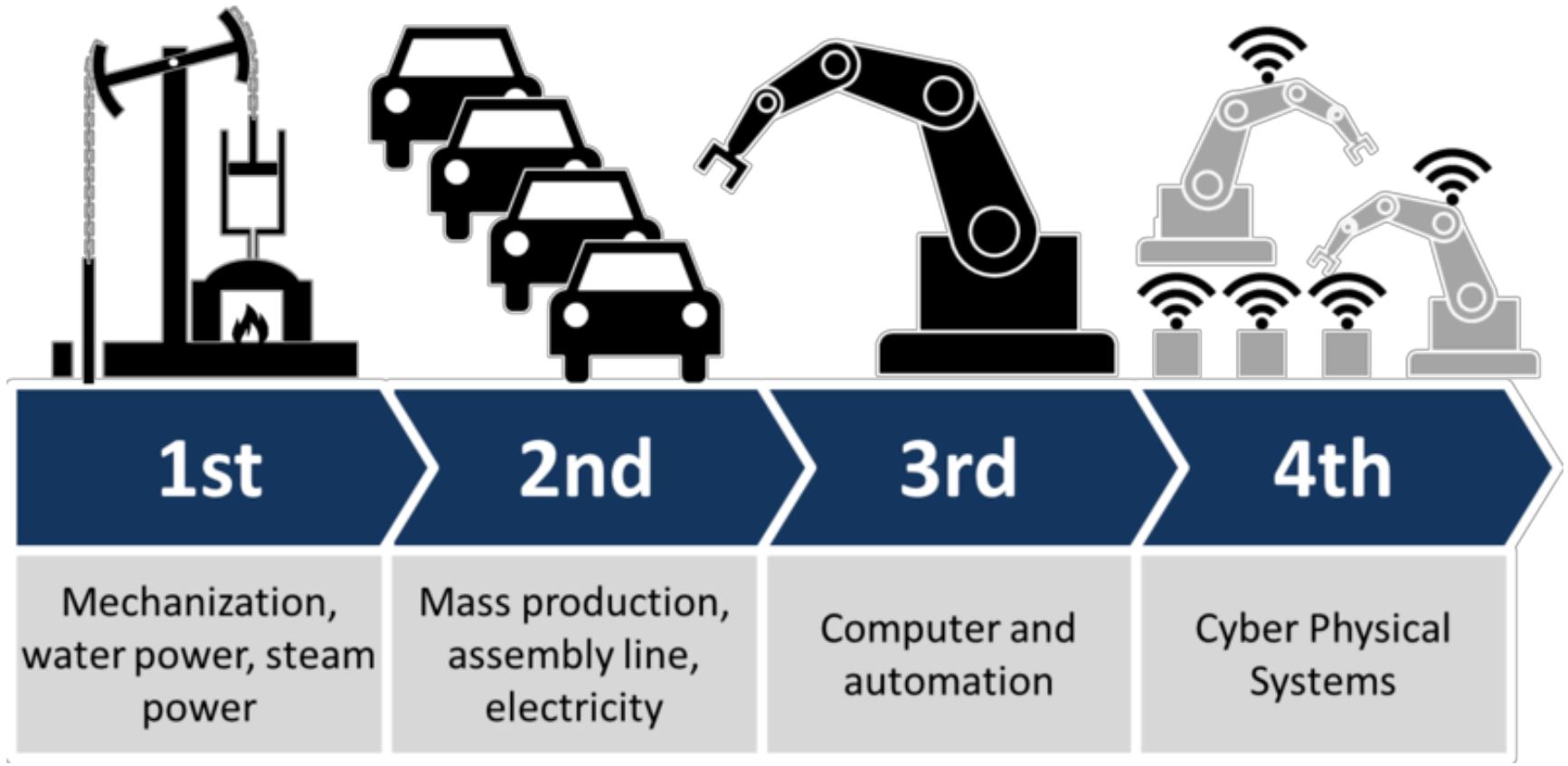
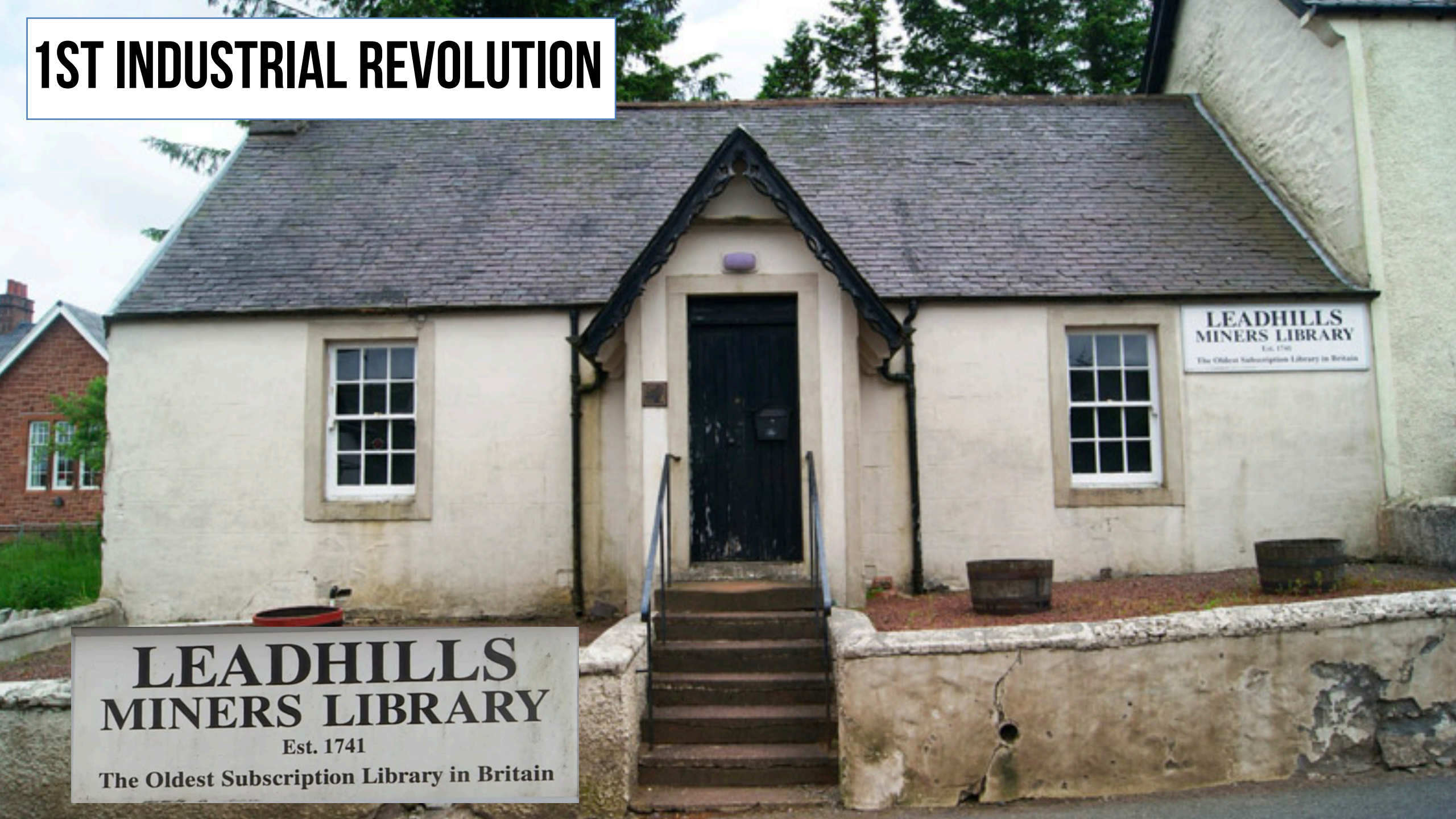
1990
2010
Concerts,
Galleries,
Daily Life
Aesthetics
Film
Civil and
Manufacturing
Infrastructure
Computing
Digital Signal Processing
Digital Content
Games
Social Media
Urban Systems
Integrative Design
Mobile Systems
Ubiquitous Computing
Maker Movement, Additive Manufacturing
Modular Content, Participatory Culture,
Responsive Environments, Internet of Things

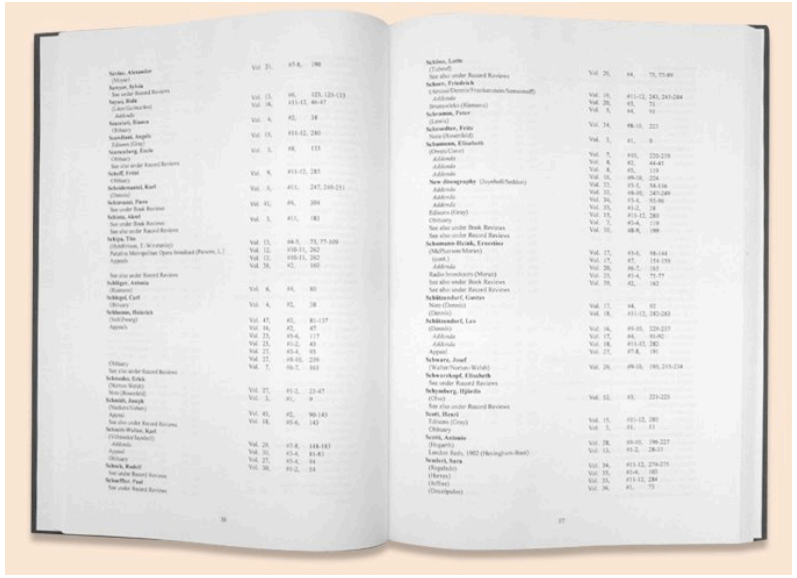


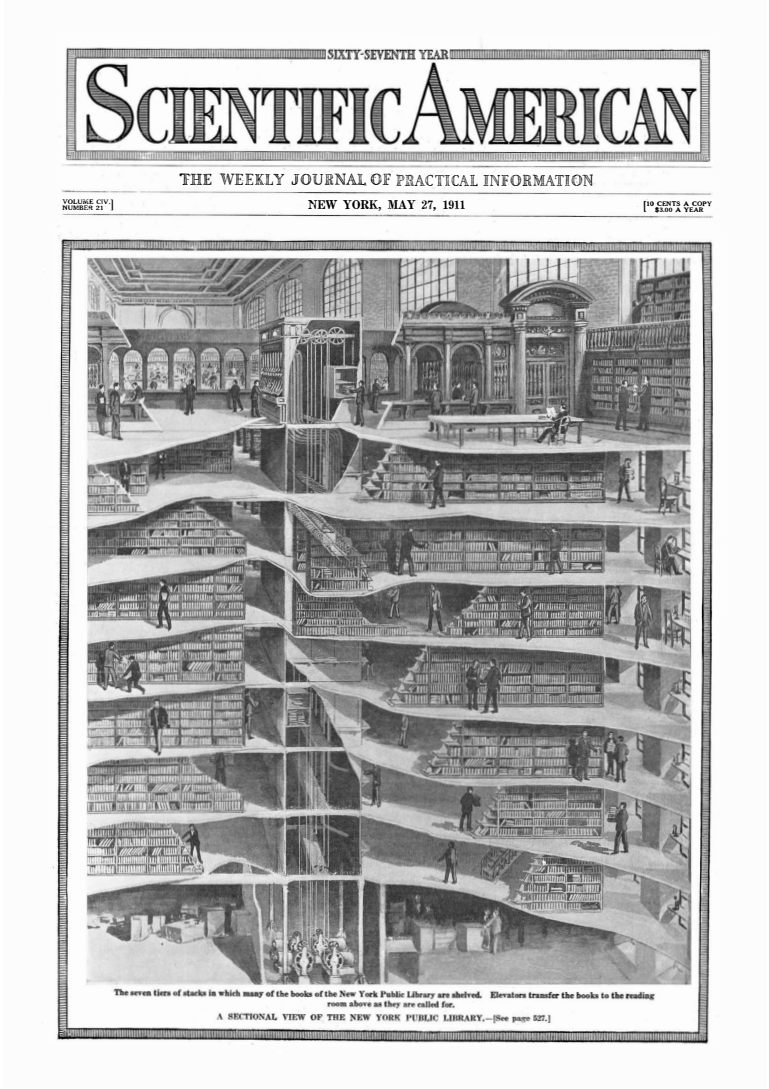
www.forbes.com/sites/bernardmarr/2016/04/05/why-everyone-must-get-ready-for-4th-industrial-revolution

1ST INDUSTRIAL REVOLUTION



2ND INDUSTRIAL REVOLUTION





SIXTY-SEVENTH YEAR

SCIENTIFIC AMERICAN

THE WEEKLY JOURNAL OF PRACTICAL INFORMATION

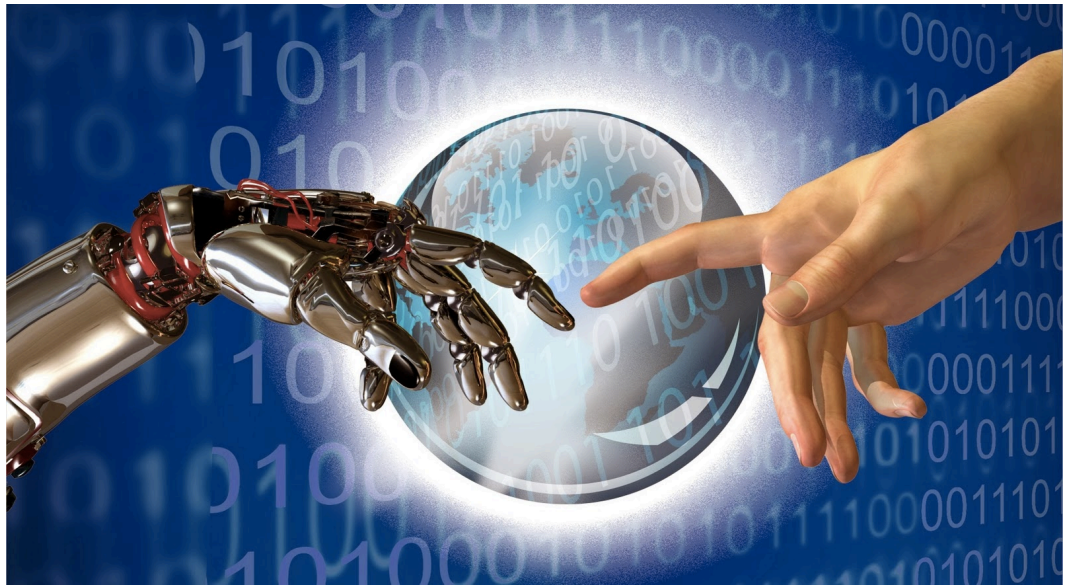
VOLUME CIV.] NUMBER 21 — NEW YORK, MAY 27, 1911 — [10 CENTS A COPY $3.00 A YEAR

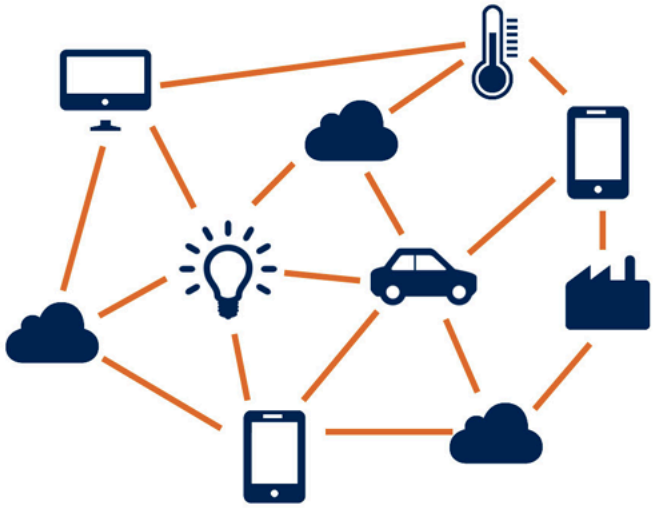
The seven tiers of stacks in which many of the books of the New York Public Library are shelved. Elevators transfer the books to the reading room above as they are called for.

A SECTIONAL VIEW OF THE NEW YORK PUBLIC LIBRARY.—[See page 527.]

3RD INDUSTRIAL REVOLUTION

4TH INDUSTRIAL REVOLUTION





http://www.oclc.org/research/publications/library/2014/oclcresearch-evolving-scholarly-record-2014-overview.html

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standards, databases, policies

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Best Match

Recommended Records

Recommended

Associated Publication?

No Publication | Has Publication

Claimed?

No Maintainer | Has Maintainer

Record Status

Uncertain | Deprecated | In developme | Ready

Standard Type

- Reporting Guideline 3
- Terminology Artifact 1

Registry

- Database 87
- Standard 4
- Policy 2

Domains

- Life Science 62
- Biomedical Science 25

Registry	Name	Abbreviation	Type	Domain	Taxonomy	Related Database	Related Standard	Related Policy	In Collection/Recommendation
	Australian Antarctic Data Centre	AADC	Database	Atmospheric Science; Biology; Environmental Science; Geology; Geophysics; Plus 4 More...	All	GBIF	None	PLOS Recommended Data Repositories; Scientific Data's Recommended Data Repositories	None
	Archaeology Data Service	ADS	Database	Classical Archeology; History; Humanities; Natural Sciences	None	None	None	Scientific Data's Recommended Data Repositories	None
	TERN AEKOS	AEKOS	Database	Biodiversity; Data Sharing; Dataset DOI/URL; Ecology; Ecosystem Science; Plus 8 More...	Animalia; Plantae	None	None	Scientific Data's Recommended Data Repositories; Scientific Data's Data Policies	Scientific Data; EMBL-ABR
	Australian Open Data Network Portal	AODN	Database	Climate; Marine Environment; Natural Sciences; Oceanography	All	None	None	Scientific Data's Recommended Data Repositories	None
	ArrayExpress	ArrayExpress	Database	Chromatin Immunoprecipitation - DNA Microarray (ChIP-Chip); Chromatin Immunoprecipitation - DNA Sequencing (ChIP-Seq); DNA Microarray; Gene Expression Data; Genotyping; Plus 4 More...	All	BioSD Expression Atlas SMD ClinVar Gemma Plus 1 more...	MAGE-TAB EFO MINSEQE MIAME/Env MIAME Plus 2 more...	GigaScience - Minimum Standards of Reporting Checklist American Association for the Advancement of Science - Science - Editorial Policies; Data Materials Availability Nature Publishing Group - Nature Biotechnology - Availability of Data and materials	PLOS; Wellcome Open Research; Scientific Data; Data Citation Implementation; EMBO Press; Plus 5 more...

The Washington Post

Health & Science

The new scientific revolution: Reproducibility at last

By Joel Achenbach January 27 Follow @joelachenbach

Diederik Stapel, a professor of social psychology in the Netherlands, had been a rock-star scientist — regularly appearing on television and publishing in top journals. Among his striking discoveries was that people exposed to litter and abandoned objects are more likely to be bigoted.

And yet there was often something odd about Stapel's research. When students asked to see the data behind his work, he couldn't produce it readily. And colleagues would sometimes look at his data and think: It's beautiful. Too beautiful. Most scientists have messy data, contradictory data, incomplete data, ambiguous data. This data was too good to be true.

nature International weekly journal of science

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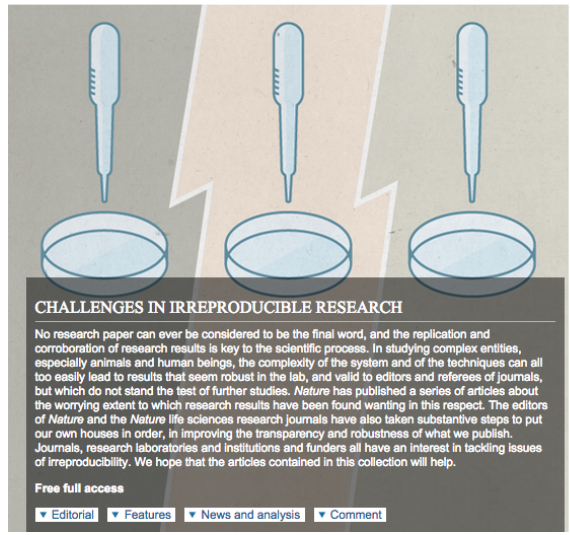
Archive > Specials & supplements archive > Challenges in irreproducible research

SPECIAL

See all specials



CHALLENGES IN IRREPRODUCIBLE RESEARCH

No research paper can ever be considered to be the final word, and the replication and corroboration of research results is key to the scientific process. In studying complex entities, especially animals and human beings, the complexity of the system and of the techniques can all too easily lead to results that seem robust in the lab, and valid to editors and referees of journals, but which do not stand the test of further studies. *Nature* has published a series of articles about the worrying extent to which research results have been found wanting in this respect. The editors of *Nature* and the *Nature* life sciences research journals have also taken substantive steps to put our own houses in order, in improving the transparency and robustness of what we publish. Journals, research laboratories and institutions and funders all have an interest in tackling issues of irreproducibility. We hope that the articles contained in this collection will help.

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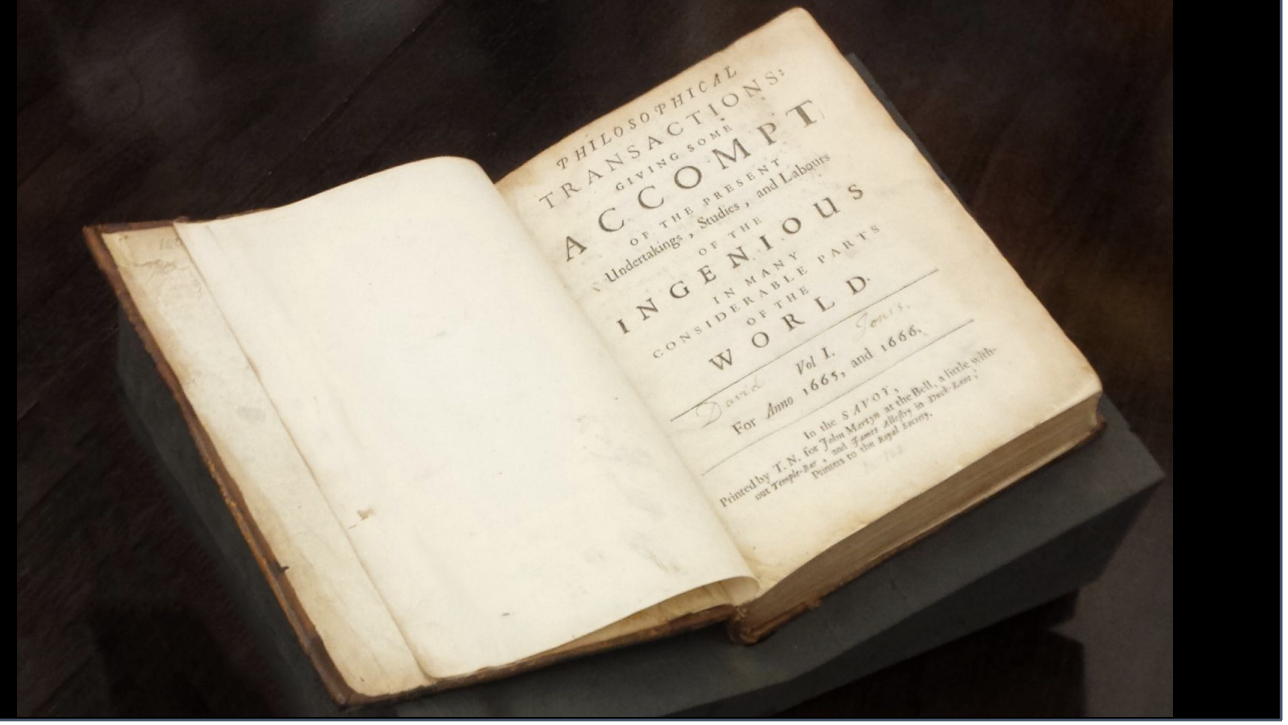
REPRODUCIBILITY INITIATIVE



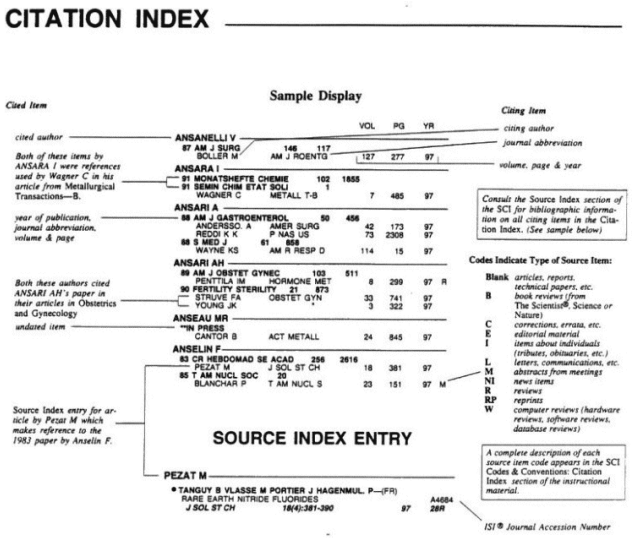
ALWAYS OPEN?

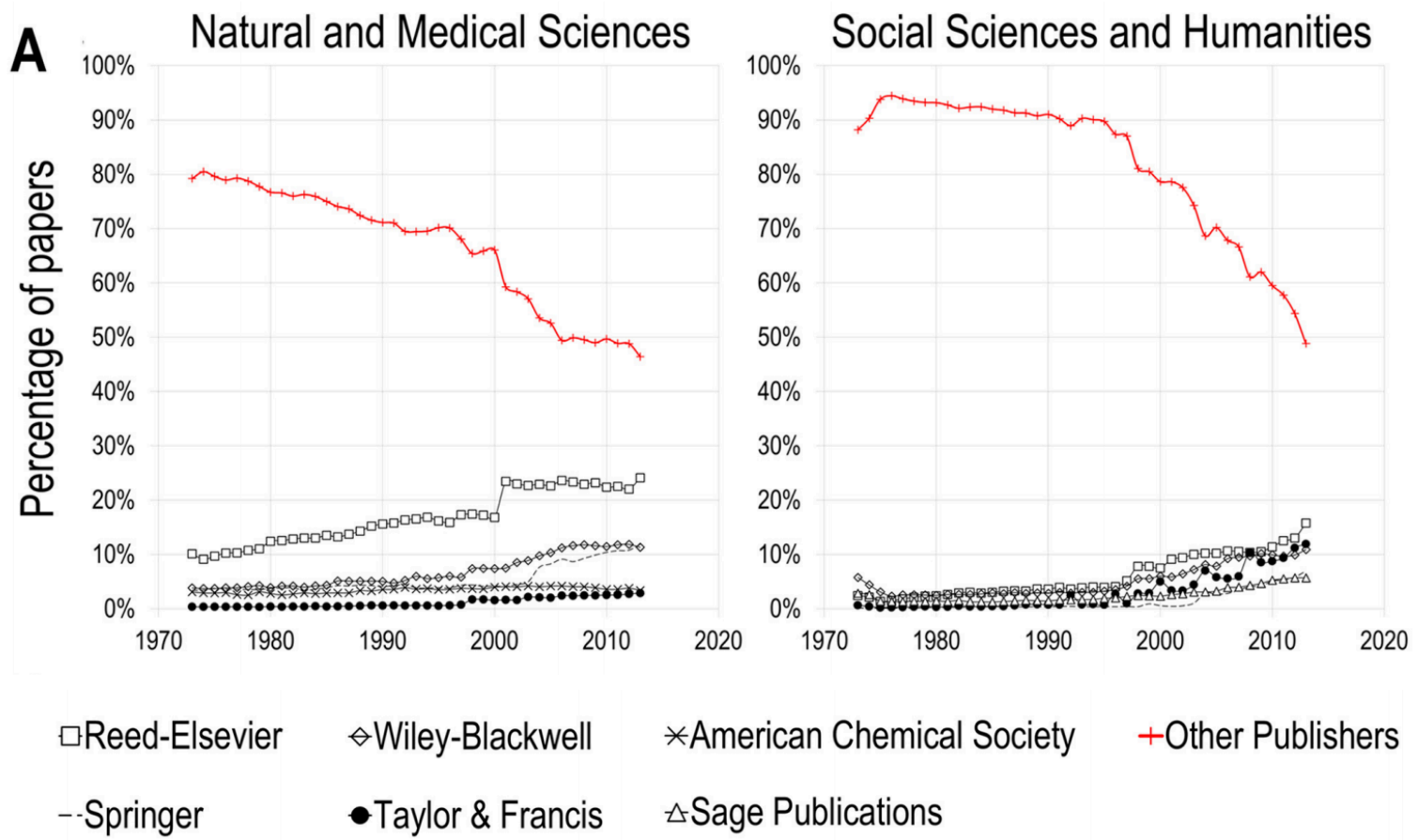
PHILOSOPHICAL TRANSACTIONS - 1665

ASSOCIATION OF IDEAS INDEX - 1960s

IMPACT FACTOR - 1960s

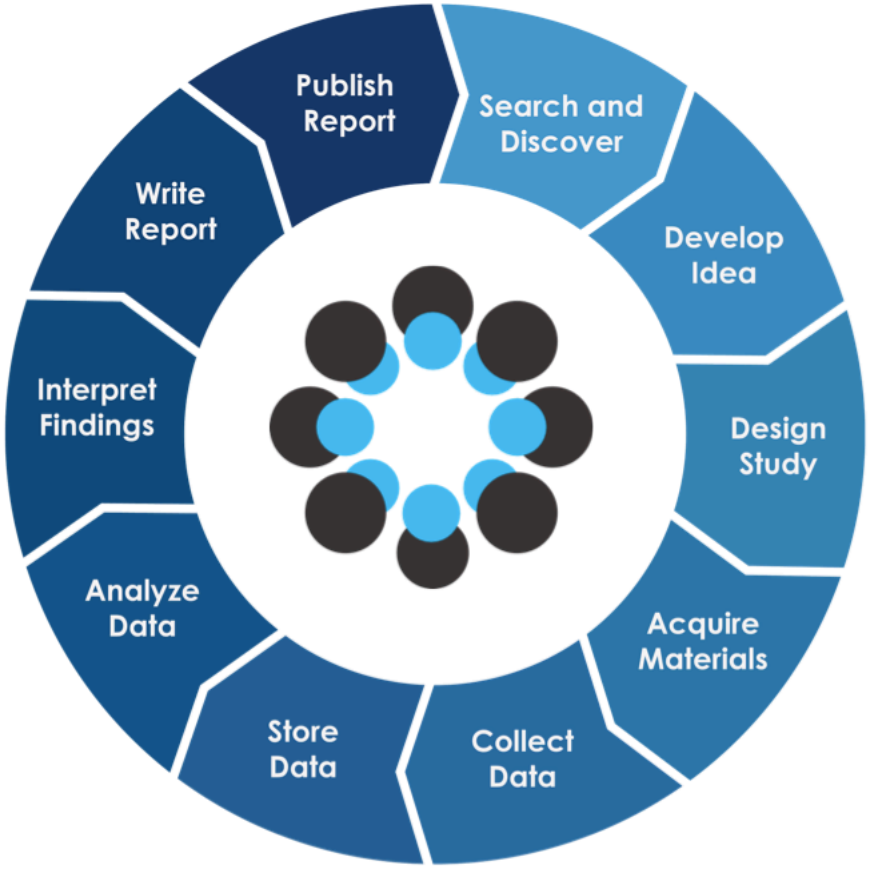
SALE OF JOURNAL TITLES BY SOCIETIES - 1960s-1980s





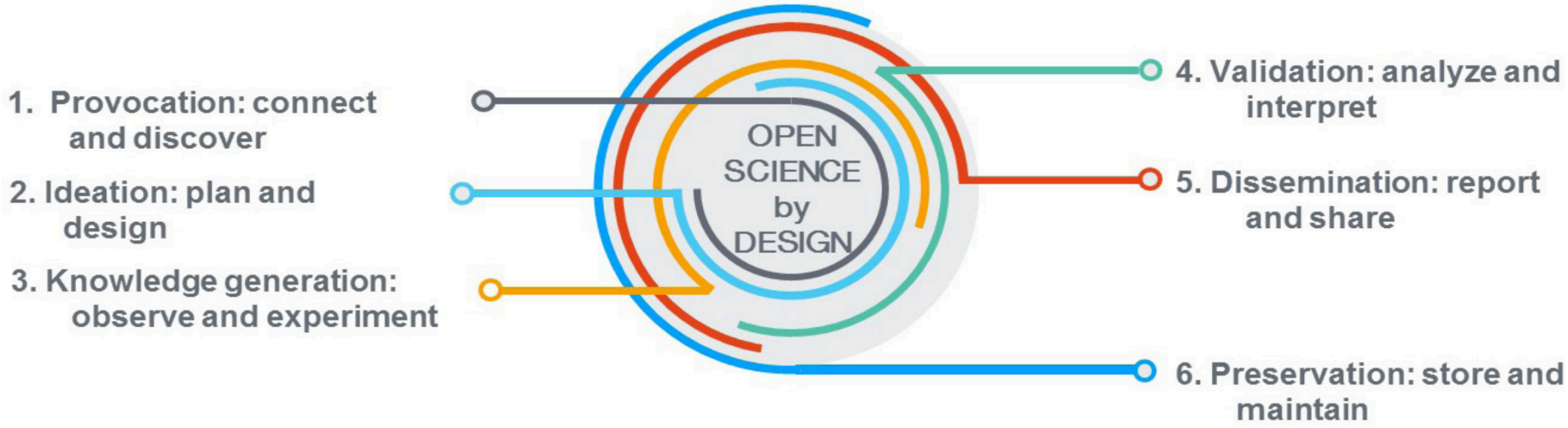
Larivière V, Haustein S, Mongeon P (2015) The Oligopoly of Academic Publishers in the Digital Era. PLoS ONE 10(6): e0127502. doi:10.1371/ journal.pone.0127502

OPEN SCIENCE



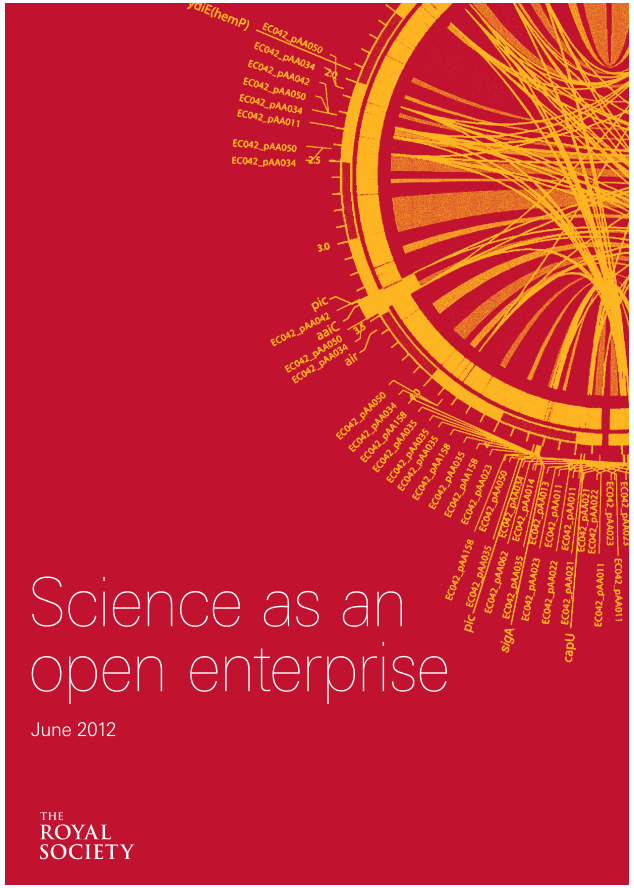
The Open Science Framework - cos.io

Open science by design



https://www.nap.edu/catalog/25116/open-science-by-design-realizing-a-vision-for-21st-century

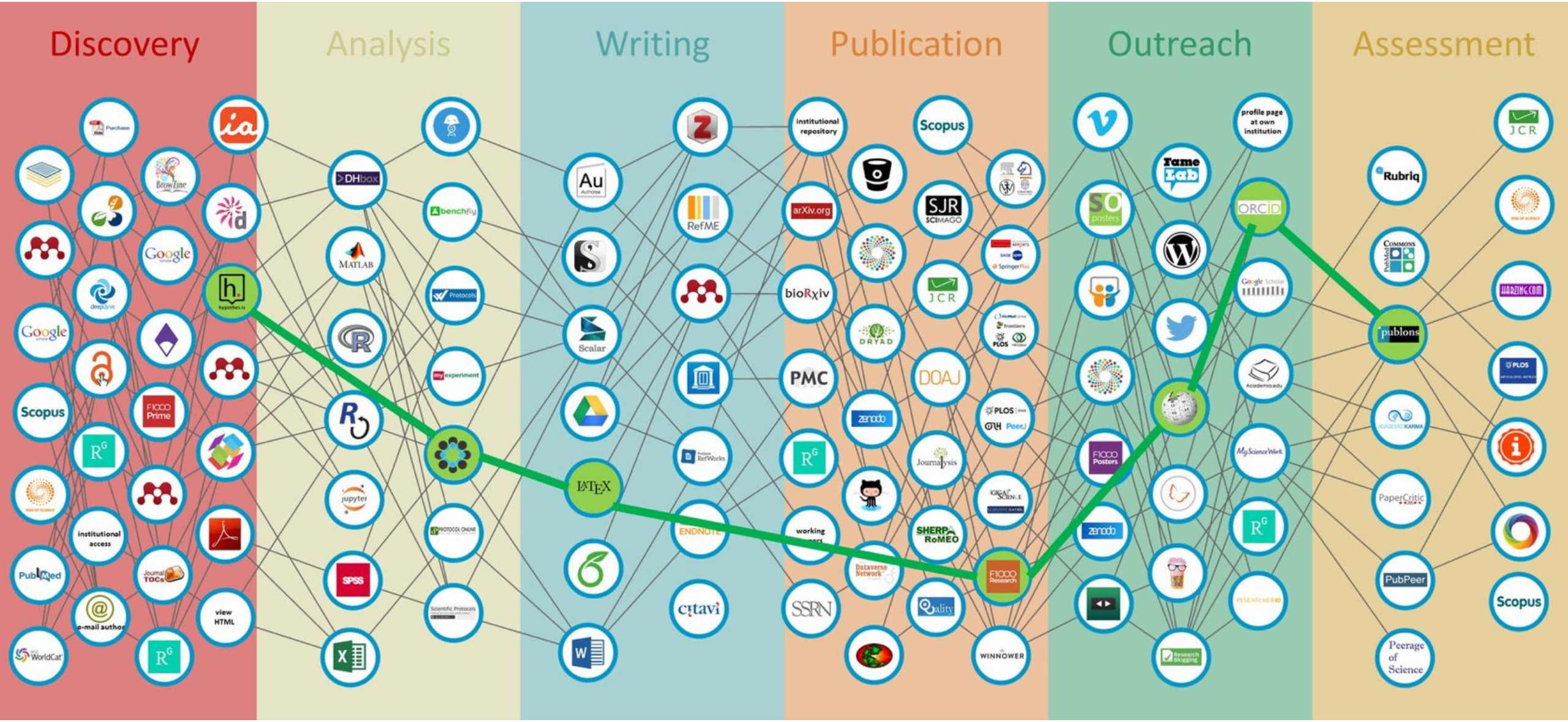
OPEN SCIENCE



101 Innovative tools and sites in 6 research workflow phases (< 2000 - 2015)

January 2015

http://figshare.com/articles/101_Innovations_in_Scholarly_Communication_the_Changing_Research_Workflow/1286826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CREATING A 21ST CENTURY LIBRARY

INDIVIDUAL EXPERIENCE

UNIVERSITY COMMUNITY

SOCIETAL IMPACT

STRATEGIC RECOMMENDATION

Create a 21st century library that serves as a cornerstone of world-class research and scholarship.

In a world where digital is becoming the default format for information, the library will remain a vital presence on campus, sustaining serious scholarship and providing opportunities for interactive research and study environments. To support this important work for students, faculty, and staff, and to create 21st century library spaces for 21st century learners, the library will:

- Develop information specialists as partners in research, teaching, and learning.
- Collaborate with peer institutions to provide coordinated access to a global collection of information resources.
- Steward the evolving scholarly record, and champion new forms of scholarly communication.
- Be recognized globally as a leader in the development of the scholarly information ecosystem.

Open Science Framework: Start

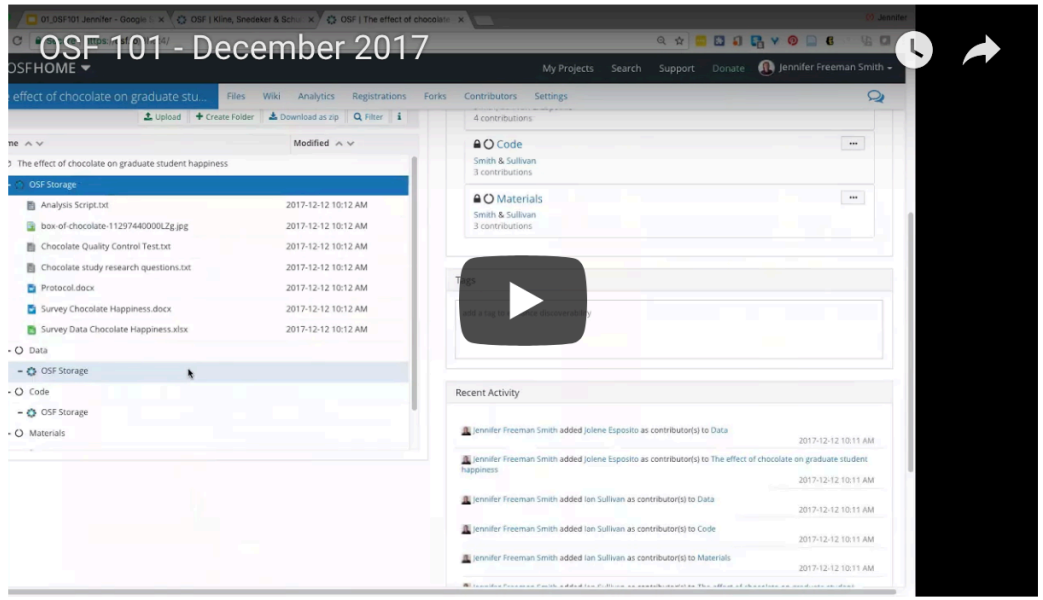
A guide for how to use the open source project management platform, Open Science Framework

About Open Science Framework

OSF is a free, open source web application for project management from the non-profit, **Center of Open Science**. Researchers use OSF to collaborate, document, archive, share, and register research projects, materials, and data. This guide will teach you how to:

- create an account on OSF
- create a project in OSF and share with collaborators
- how to organize projects
- preregister a research project
- how to get a DOIs

Getting Started with OSF



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Get started by **creating a free account** with your Andrew ID. Find helpful info on how OSF can be used **here**.

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Manage Information & Data	Work with our specialists to evaluate, select, and navigate the tools to organize your data and keep your project on track.	figshare
Publish & Share Your Research	Navigate the many options for publishing your research to optimize its accessibility and impact.	Overleaf
Measure Impact & Manage Your Digital Identity	Identify when and where your research has been cited, as well as the scope of its reach.	Elements, Altmetric, SciVal Experts
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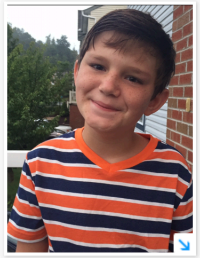
USA TODAY

Boy without one-sixth of his brain is a remarkably 'normal' 12-year-old

USA TODAY NETWORK Ashley May, USA TODAY Published 9:00 a.m. ET Aug. 3, 2018 | Updated 10:03 a.m. ET Aug. 3, 2018



(Photo: Courtesy of the Collins family)

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A boy who had one-sixth of his brain removed to stop daily seizures now acts like a typical 12-year-old, according to researchers and his parents.

Tanner Collins from New Stanton, Pennsylvania, was six years old when he had a tumor in the right hemisphere of his brain removed. At the time, his family was unsure if it was benign or malignant. Before the surgery, his parents, who are both nurses, felt they had exhausted options to rid him of frequent seizures. The anti-seizure medications were also taking their toll on Tanner's personality, behavior, and performance in school, his parents Carl and Nicole Collins said.

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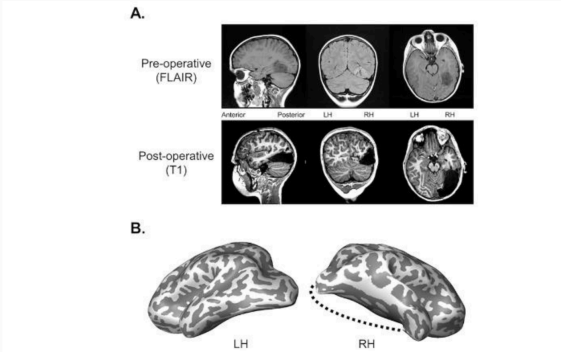
CNN Health » Food | Fitness | Wellness | Parenting | Vital Signs Live TV U.S. Edition +

When surgeons removed one sixth of a child's brain, here's what happened

By Susan Scutti, CNN

Updated 11:51 AM ET, Tue July 31, 2018



Surgeons removed part of a child's brain for epilepsy and it rewired itself.

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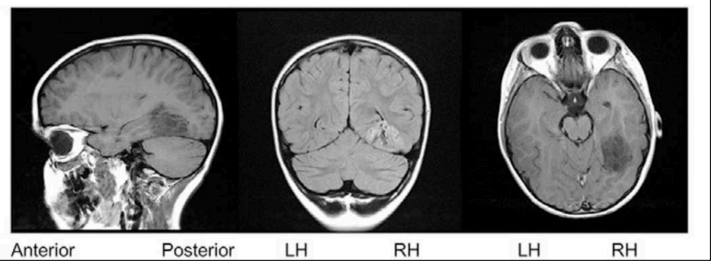
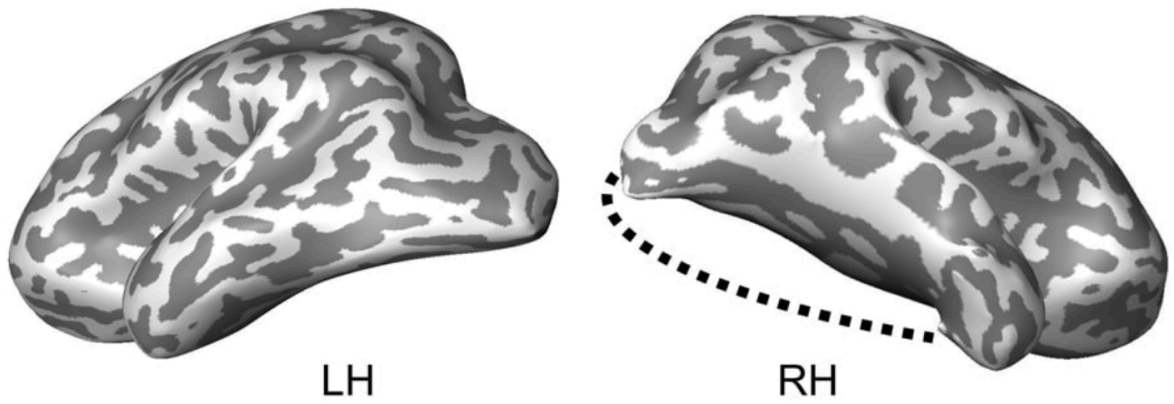
DAILY NEWS 31 July 2018

Boy's brain works just fine after a large piece was removed





The figure shows the left and right hemispheres of the patient's brain after the procedure. The dotted line indicates where the entire occipital lobe, which includes the brain's visual processing center, and most of his temporal lobe were removed. Despite the lobectomy and although the patient can't actually see the left half of his world, the preserved left hemisphere compensated for visual tasks such as recognizing faces and objects.

Related

Washington Post: A 12-year-old had one-sixth of his brain removed. He feels 'perfectly normal.' ▸

Newsweek: Lobectomy Study: Scientists Reveal Boy's Incredible Recovery After Large Chunk of his Brain was Removed ▸

PBS News Hour: A child lost a sixth of his brain, then made an amazing comeback ▸

Cell Reports: Successful Reorganization of Category-Selective Visual Cortex following Occipito-temporal Lobectomy in Childhood ▸

August 01, 2018

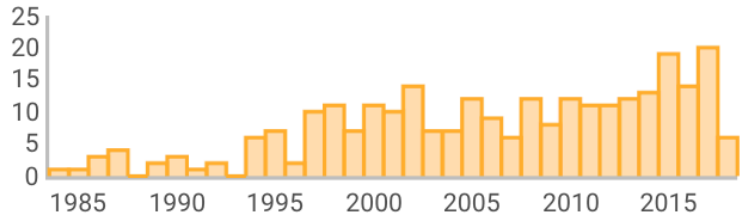
Case Study: Child's Lobectomy Reveals Brain's Ability To Reorganize Its Visual System

After three years, patient recognizes faces normally, despite removal of preeminent regions involved in facial recognition

My Summary

300 publications

+ add



h-index:	59 Scopus	52 Web of Science

How do we calculate this?

Claimed publications:

- 2 books
- 7 chapters
- 2 conferences
- 18 datasets
- 260 journal articles
- *(Show fewer)*
- 4 filesets
- 7 other

Pending publications:

You have no pending publications.

My publications

Mine (260) | Pending (0) | Not mine (0)

Sort by: Reporting date (newest to oldest)

10 results per page | 1-10 of 260 | Page: 1 2 ... 26

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Successful Reorganization of Category-Selective Visual Cortex following Occipito-temporal Lobectomy in Childhood

Summary | Organisation users (4) | History (3) | Data sources (3) | Full text | Links (4)

Liu TT, Nestor A, Vida MD, Pyles JA, Patterson C, Yang Y, Yang FN, Freud E, Behrmann M

Cell Reports **24**(5):1113-1122.e6 31 Jul 2018 doi

Reporting date: 01 Jan 2018 Edit

Altmetrics	Citation Metrics		Journal Rankings	
	Scopus	WoS	*Cell Reports*	
633	0	-	SNIP	SJR
			1.65	7.55

Journal article

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In the top 5% of all research outputs scored by Altmetric

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- **6** blogs
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Readers on

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SUMMARY | News | Blogs | Twitter | Facebook | Google+ | Reddit

Title	Successful Reorganization of Category-Selective Visual Cortex following Occipito-temporal Lobectomy in Childhood
Published in	Cell Reports, July 2018
DOI	10.1016/j.celrep.2018.06.099
Pubmed ID	30067969
Authors	Liu, Tina T., Nestor, Adrian, Vida, Mark D., Pyles, John A., Patterson, Christina, Yang, Ying, Yang... [show]
Abstract	Investigations of functional (re)organization in children who have undergone large cortical... [show]

View on publisher site

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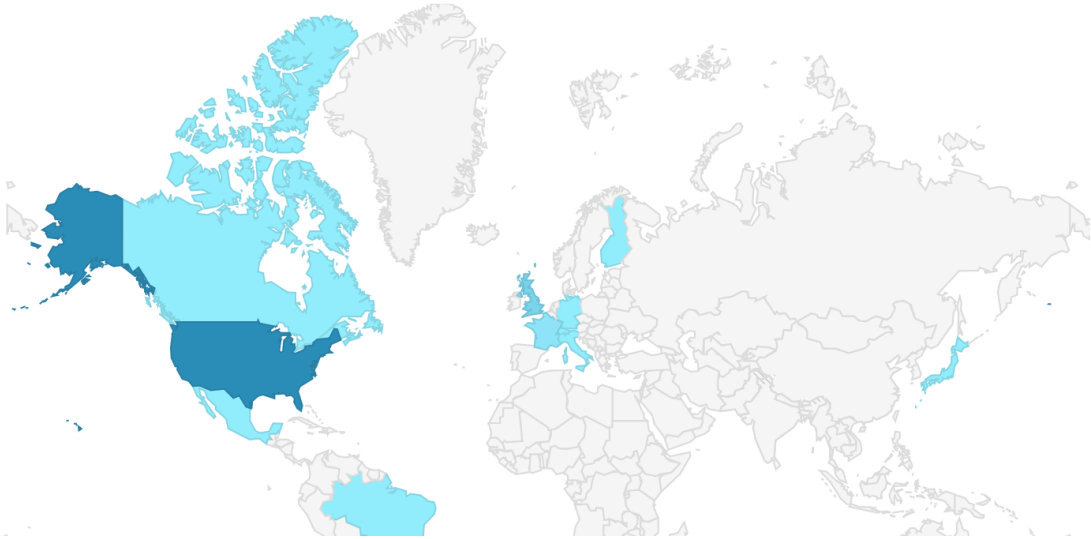

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- **64** tweeters
- **3** Facebook pages
- **2** Google+ users
- **1** Redditor

Readers on

- **20** Mendeley

SUMMARY | News | Blogs | Twitter | Facebook | Google+ | Reddit

So far, Altmetric has seen **77** news stories from **71** outlets.

Hoeveel brein heb je eigenlijk echt nodig?

Volkskrant, 08 Sep 2018

Een 44-jarige man komt bij de dokter.Hij heeft de laatste tijd weinig kracht in zijn linkerbeen.

Brain's 'plasticity' amazes as boy recovers from drastic surgery

Health24, 08 Aug 2018

The developing brain of a growing child has incredible ways of compensating for the loss of an essential brain region, a new...

Plasticity after Lobectomy; The Hunt for ALS Genes; Marijuana and MS Patients

MedPage Today, 07 Aug 2018

A child who lost more than one-third of the right side of his brain showed intact cognitive abilities and intermediate- and high...

Epilepsie. Un enfant guéri par l'ablation d'une partie de son cerveau

Free , 06 Aug 2018

Un garçon de six ans a subi une ablation partielle du cerveau afin de soigner son épilepsie.

A 12-year-old had one-sixth of his brain removed. He feels 'perfectly normal.'

Tampa Bay Times, 05 Aug 2018

It was a solution no parent wants to hear: To get rid of a brain tumor and stop their young son's seizures, surgeons would need...

Après l'ablation d'une partie de son cerveau, ce garçon va bien

Top Santé, 05 Aug 2018

Un peu avant l'âge de 7 ans, on lui a retiré un tiers de l'hémisphère droit de son cerveau pour soigner son épilepsie.

Epilepsie : un enfant de 6 ans soigné grâce à l'ablation d'une partie de son cerveau

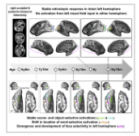
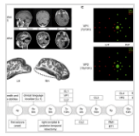
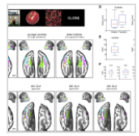
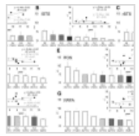
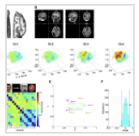
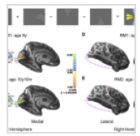
Erstaunlicher Fall: Ärzte entfernen Epileptiker Teile des Gehirns

Outline

Highlights
Summary
Graphical Abstract
Keywords
Introduction
Results
Discussion
STAR★Methods
Acknowledgments
Supplemental Information
References

Show full outline

Figures (6)

Tables (1)

Table

Extras (2)

Document S1. Figures S1–S5 and Tables S1 and S2
Document S2. Article plus Supplemental Information

Cell Reports

Volume 24, Issue 5, 31 July 2018, Pages 1113-1122.e6
open access

Report

Successful Reorganization of Category-Selective Visual Cortex following Occipito-temporal Lobectomy in Childhood

Tina T. Liu [1, 2], Adrian Nestor [3], Mark D. Vida [1, 2], John A. Pyles [1, 2], Christina Patterson [4], Ying Yang [1, 5], Fan Nils Yang [6, 7], Erez Freud [1, 2], Marlene Behrmann [1, 2, 8]

Show more

https://doi.org/10.1016/j.celrep.2018.06.099

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Open Access funded by National Institutes of Health

Highlights

- A 3-year longitudinal investigation of visual plasticity post lobectomy in a child
- Stable left homonymous hemianopia and no remapping of the early visual cortex
- Competition between face and word selectivity within a single (left) hemisphere
- Intact cognitive abilities and intermediate- and high-level visual function

Summary

Bootstrapped regression slopes were calculated from the randomly picked 4 values (as a proxy for 4 sessions) after shuffling the condition labels in the upper (or equivalently the lower) RDM. This analysis yielded a distribution of the bootstrapped regression slopes (cyan histogram in Figure 4F), and the face and word dissimilarity slope (red dot in Figure 4F) and the house and object dissimilarity slope (yellow dot in Figure 4F) was each compared with this null distribution. To establish the statistical significance of the difference between bootstrapped slopes and the face and word dissimilarity slope or the house and object dissimilarity slope, we calculated the 95% CI of the obtained bootstrap distribution of the mean. For comparison, see RSA on a control anatomical region (LO2) in Figure S3.

Data and Software Availability

Behavioral and fMRI data and experiment scripts are available on KiltHub, which is a part of figshare (https://figshare.com/articles/Successful_Reorganization_of_Category-Selective_Visual_Cortex_Following_Occipito-Temporal_Lobectomy_in_Childhood/5919409/1).

Acknowledgments

This research was supported by NIH grant RO1 EY027018 (to M.B.) and a Presidential Fellowship from Carnegie Mellon University (CMU) (to T.T.L.). We thank Joel Greenhouse and Yuanning Li for statistical advice, Ev Fedorenko for providing the language localizer, and David Plaut for helpful comments. We also thank the patient, the controls, and their families for their time and cooperation; MRI technologists Scott Kurdilla and Debbie Viszlay for help with imaging; and the VisCog group at CMU for fruitful discussion.

Author Contributions

Conceptualization, A.N. and M.B.; Methodology, A.N., M.D.V., and J.A.P.; Investigation, T.T.L., M.D.V., and J.A.P.; Formal Analysis, T.T.L., F.N.Y., and A.N.; Software, Y.Y.; Writing – Original Draft, T.T.L. and M.B.; Writing – Review & Editing, T.T.L., M.D.V., J.A.P., Y.Y., A.N., E.F., and M.B.; Visualization, E.F.; Funding Acquisition, A.N. and M.B.; Resources, C.P.; Supervision, M.B.

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DATASET

BOLD5000

Nadine Chang 11/09/2018

An Engineering and Behavioral Sciences Approach to Understand ...

What You See Is What You Get: Data-Informed Workflow in Design ...

Consuming Nature: Fresh Fruit, Processed Juice, and the Remakin...

README_Liu Fre… .txt (3.65 kB)

Liu Freud et al_20….rar (4.72 GB)

Intact visuoperceptual function and category-selective organization in children with cortical resections

Dataset posted on 24.07.2018, 16:59 by Tina Liu, Erez Freud, Marlene Behrmann, Christina Patterson

This dataset includes fMRI raw data, behavioral data, experiment codes, and scripts related to the manuscript entitled: Intact visuoperceptual function and category-selective organization in children with cortical resections.

The fMRI folder includes raw fMRI data from 10 patients and 10 matched controls. In each participant, there was 1 anatomical scan and 3 functional runs of a category localizer, except in the case of one patient (NN) and the matched control, there were only two runs.

The behavioral folder includes raw data from 7 patients and 7 matched controls: each participated in 4 visuoperceptual tasks, focusing on global form perception (Glass pattern, contour integration) and pattern recognition (face recognition, object recognition).

All personally identifiable information has been removed. For more details, contact: behrmann@cmu.edu, tinaliutong@gmail.com.

FUNDING

NIH (RO1 EY027018)

DATE

24/07/2018

CATEGORIES

- Neuroscience

KEYWORD(S)

cortical resection | plasticity | lobectomy | face processing | word processing | vision | visual pathway | visual function

Google Dataset Search

marlene behrmann

About

Updated Oct 4, 2017

Data from: Successful Reorganization of Category-Selective Visual Cortex...
figshare.com
search.datacite.org
Updated Feb 23, 2018

Intact visuoperceptual function and category-selective organization in...
figshare.com
Updated Jul 24, 2018

The large-scale organization of shape processing in the ventral and dorsal...
figshare.com
search.datacite.org
Updated Oct 4, 2017

F

The large-scale organization of shape processing in the ventral and dorsal...
figshare.com

Intact visuoperceptual function and category-selective organization in children with cortical resections

figshare.com

Dataset created Jul 24, 2018
Dataset updated Jul 24, 2018
Dataset published Jul 24, 2018

Dataset provided by
figshare

Authors
Tina Liu; Erez Freud; Marlene Behrmann; Christina Patterson

License
https://creativecommons.org/licenses/by/4.0/

Description

This dataset includes fMRI raw data, behavioral data, experiment codes, and scripts related to the manuscript entitled: Intact visuoperceptual function and category-selective organization in children with cortical resections.

Organizers:
Huajin Wang
Ana Van Gulick
Melanie Gainey
Eric Yttri

October 18-19, 2018

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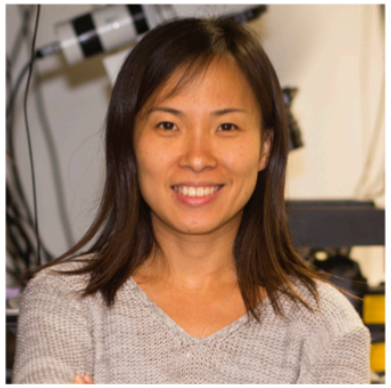
The Inception

Ana Van Gulick

Librarian, Psychology and Brain Sciences

Carnegie Mellon University



Huajin Wang

Librarian, Biology and Computer Science

Carnegie Mellon University

Melanie Gainey

Librarian, Biological Sciences

Carnegie Mellon University

- “Open science is super important - let’s host an event to bring people together!”
- We need to engage researchers
- We need resources

Embedded liaison librarianship = collaboration with faculty

Eric Yttri

Assistant Professor of Biological Sciences

Carnegie Mellon University

“Open science is super important - it brought so many collaborations to my research!!”

Grant support and buy-in from college(s)

Rebecca Doerge

Dean of the Mellon College of Science

Carnegie Mellon University

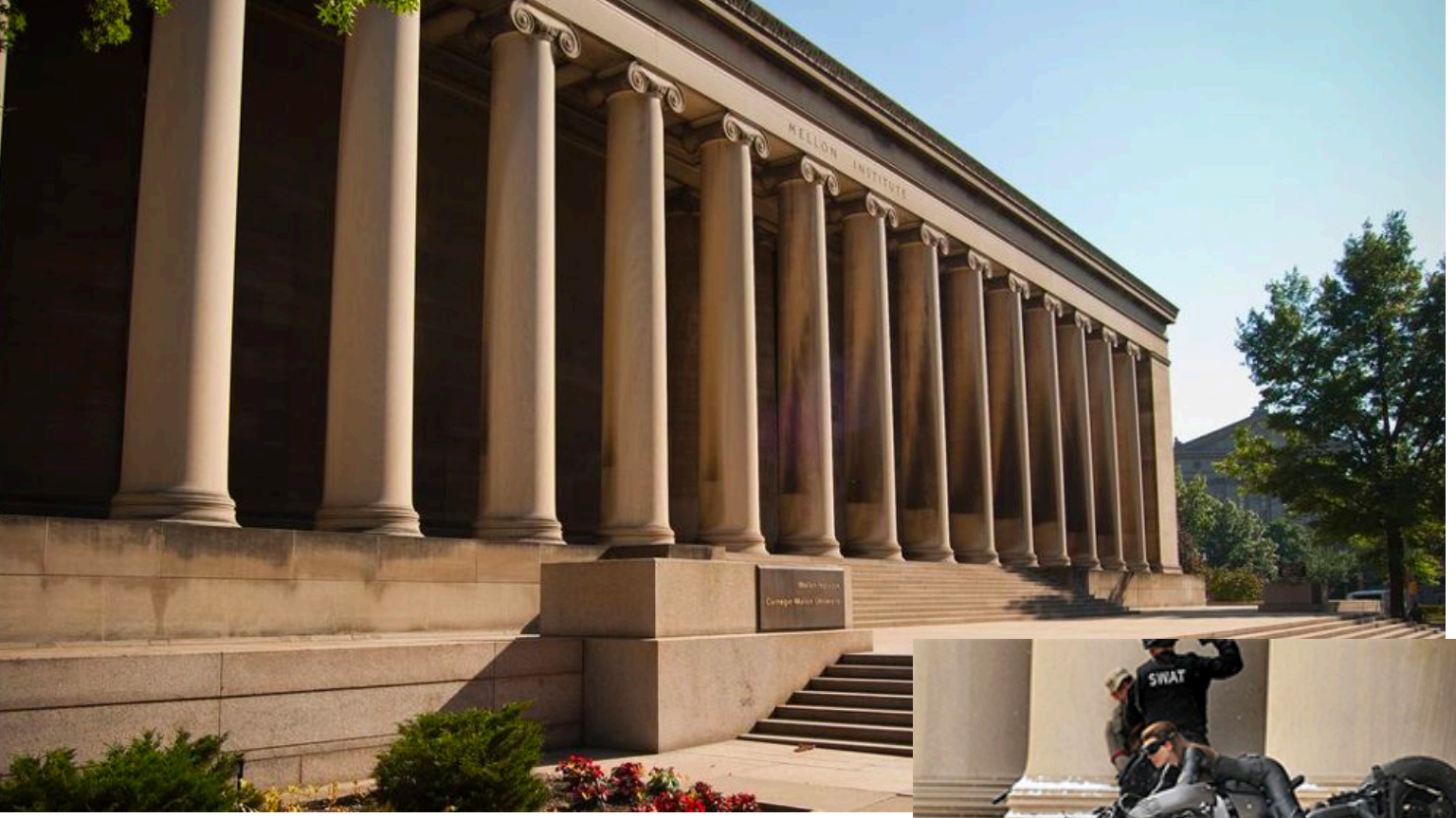
David Scaife Foundation:

“Here is some money - do some exciting things with it.”

Rebecca (Dean of MCS):

“*THIS* is the future of science!”

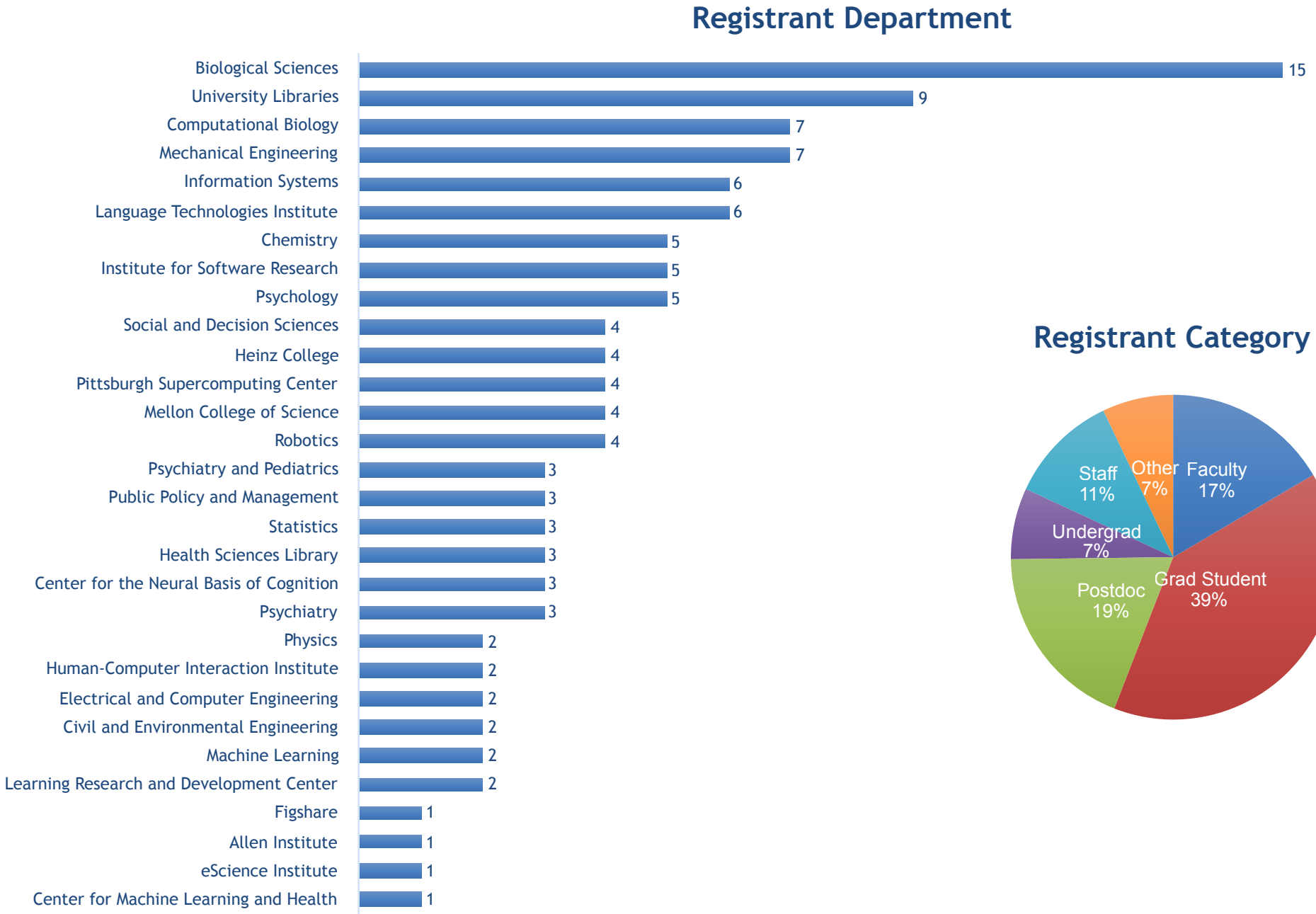
The Venue



Mellon Institute

City Hall of Gotham

The Participants



Day 1:
Talks and Panels

Open Science in Research

Open Data and Reproducibility

Open Tools and Platforms

Open Access

The “Speed Dating”

Day 2: Hands-on Workshops

Track 1

- Preparing your data and code for reproducible publication (Code Ocean)
- Open Science on Bridges (Pittsburgh Super Computing Center)

Track 2

- Bioconductor (Sean Davis, NCI)
- ENCODE pipeline development framework: making your computational analysis scalable, reliable, portable and reproducible

Track 1+2

- Lightning talks: BenchSci, Protocols.io, Open Science Framework
- Lunch and KiltHub Deposit-a-thon (CMU Libraries)

Highlights

Open hardware and software

Josh Siegle

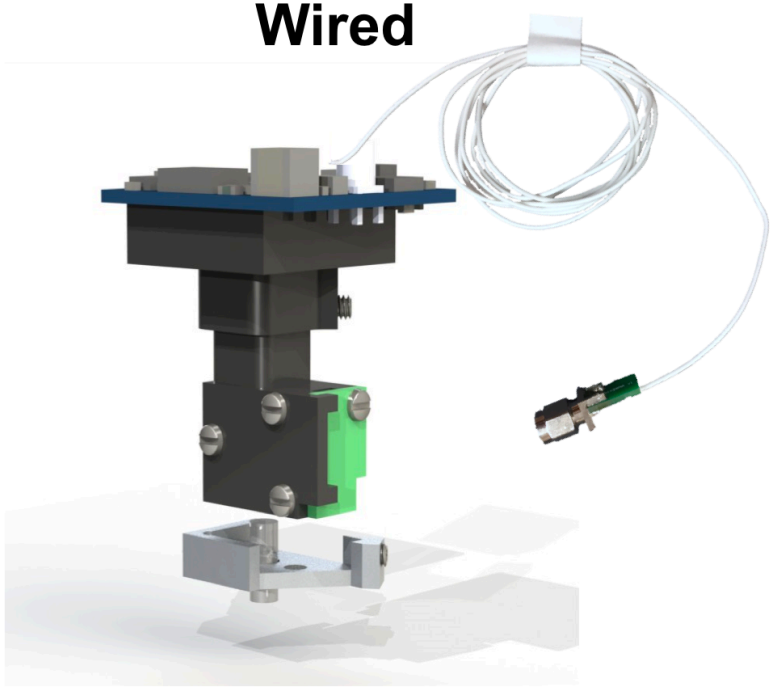
Scientist I

Allen Institute

Open hardware and software

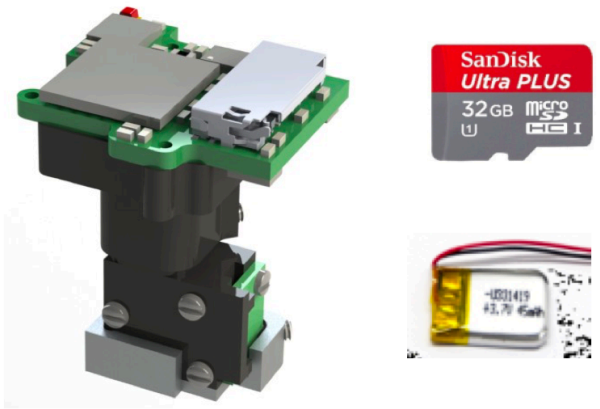
Open-source Miniscopes

Wired



Cai et al., *Nature*, 2016

Wire-free



Shuman et al., *bioArxiv*, 2018

Denise Cai

Assistant Professor of Neuroscience

Mount Sinai

Large scale team science

The era of "brain observatories"

Allen Institute for Brain Science

Human Connectome Project (HCP),
(2012-2015), N = ~1,200

Healthy Brain Network (HBN),
(2016--), N = ~10,000

Adolescent Brain Cognitive Development,
(2016--), N = ~10,000

UK Biobank,
(2018--), N = ~500,000

Ariel Rokem

Senior Data Scientist

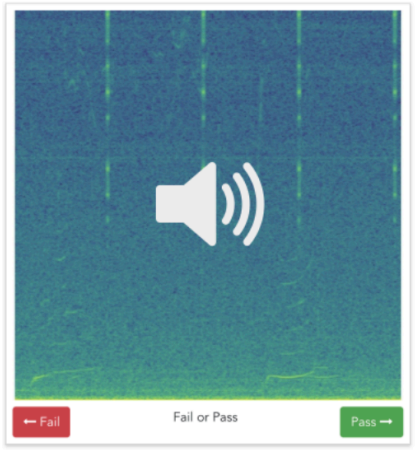
eScience Institute, University of Washington

Open framework for citizen science

Swipes for Science

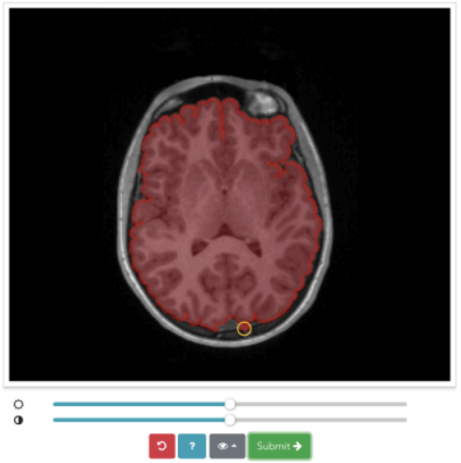
https://github.com/SwipesForScience/SwipesForScience

braindrles.us



whaledr

appstract.pub



brainspot

Thanks eLife Innovation!

Anisha Keshavan

Postdoctoral Fellow

Institute of Learning and
Brain Sciences
University of Washington

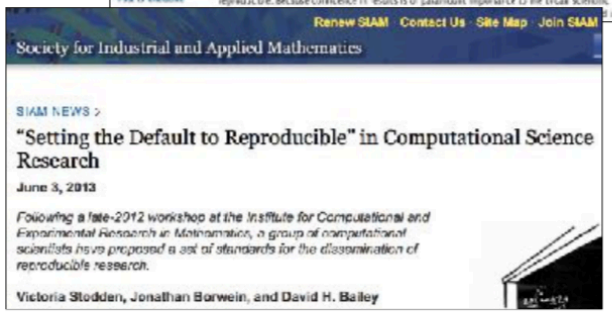
Different flavors of reproducibility

Parsing Reproducibility

"Empirical Reproducibility"

"Statistical Reproducibility"

"Computational Reproducibility"



V. Stodden, IMS Bulletin (2013)

Victoria Stodden

Associate Professor of Statistics

University of Illinois at Urbana-Champaign

Reproducible computing on HPC

Bridges-DL: Scalable AI for Open Research

Introducing NVIDIA Volta and DGX-2 to Bridges addresses the changing nature of research, building on Bridges' strength in converged HPC, AI, and Big Data to provide research with an extraordinary platform for AI and AI-enabled simulation.

1 NVIDIA DGX-2: The most powerful AI system for the most complex AI challenges

Couples 16 NVIDIA Volta 32GB SXM2 GPUs at 2.4 TB/s bisection bandwidth
- 81,920 CUDA cores and 10,240 tensor cores
- 2 Pf/s mixed-precision tensor performance
- 512 GB HBM2 memory
- 8 × 3.84 TB NVMe SSDs

9 HPE Apollo 6500 Gen10 servers: Balancing great AI capability and capacity

Each couples 8 NVIDIA Volta GPUs with NVLink 2.0

Installation starting week!

Volta introduces *Tensor Cores* to accelerate neural networks, yielding extremely high peak performance for appropriate applications.

With 88 Voltas, *Bridges-DL* provides:
- *9.9 Pf/s mixed-precision tensor*
- 251 Tf/s 32-bit
- 125 Tf/s 64-bit

Carnegie Mellon University PSC University of Pittsburgh

Paola Buitrago

Artificial Intelligence and Big Data Group Leader

Pittsburgh Supercomputing Center

Nick Nystrom

Interim Director

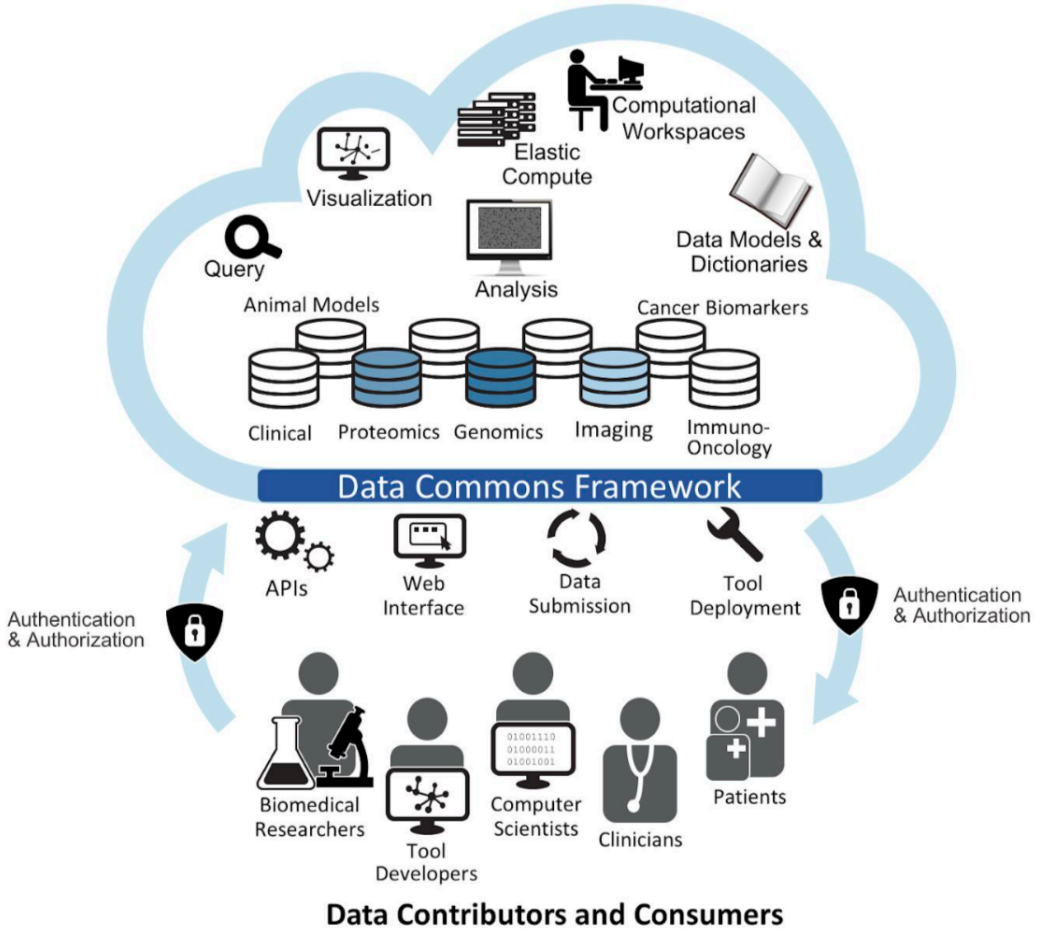
Pittsburgh Supercomputing Center

National scale data collection and curation

NCI Cancer Research Data Commons (CRDC) - Concept

NCI Scope: "*Create a data science infrastructure necessary to connect repositories, analytical tools, and knowledge bases*"

Data commons co-locate data, storage and computing infrastructure with commonly used services, tools & apps for analyzing and sharing data to create an interoperable resource for the research community.*



*Robert L. Grossman, Allison Heath, Mark Murphy, Maria Patterson and Walt Wells, A Case for Data Commons Towards Data Science as a Service, IEEE Computing in Science and Engineer, 2016. Source of image: The CDIS, GDC, & OCC data commons infrastructure at the University of Chicago Kenwood Data Center.

Sean Davis

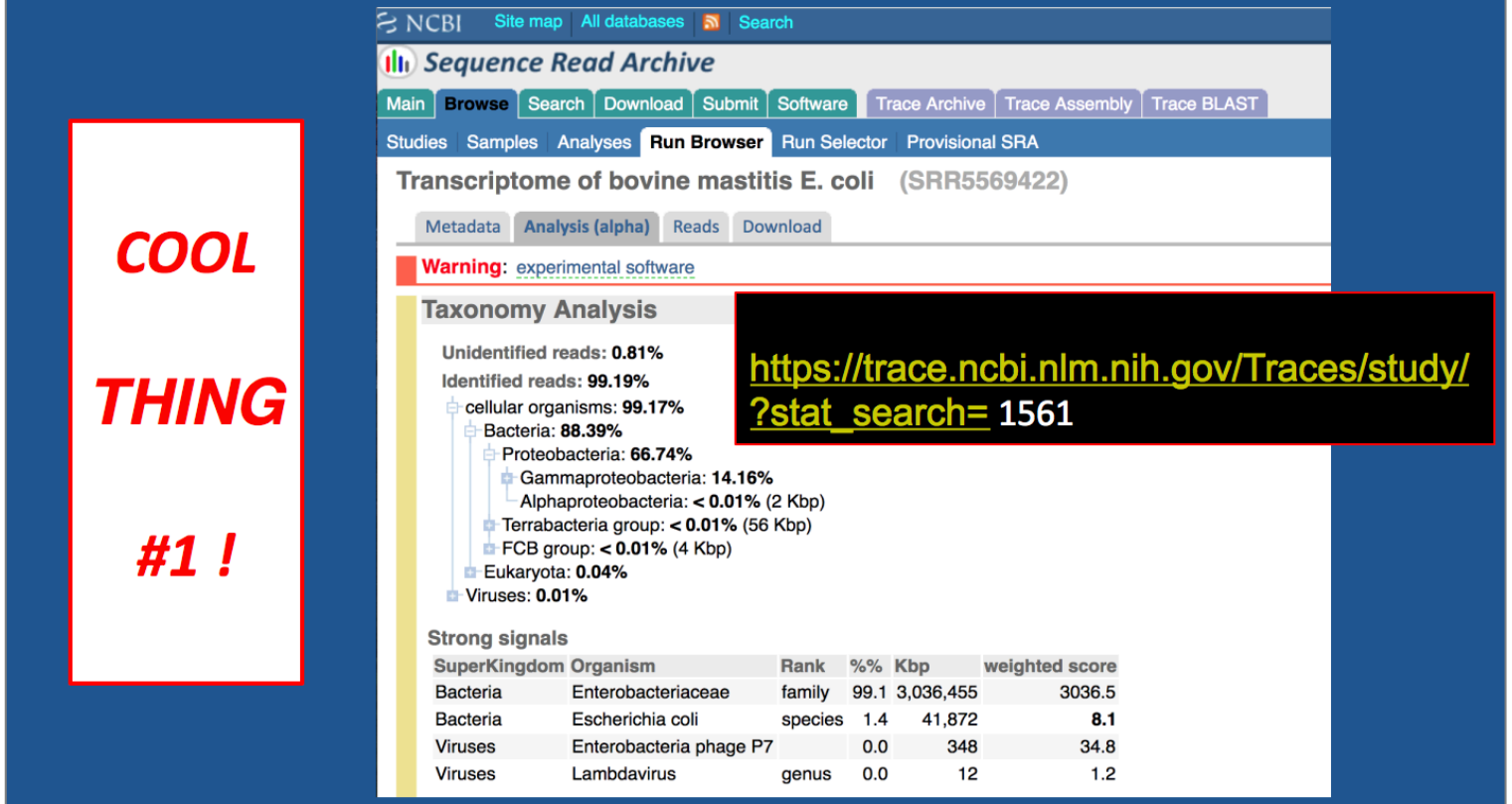
Senior Associate Scientist

National Cancer Institute (NCI)

National scale data collection and curation

Now all of SRA is taxonomically indexed!

COOL THING #1 !



https://trace.ncbi.nlm.nih.gov/Traces/study/?stat_search= 1561

NIH U.S. National Library of Medicine

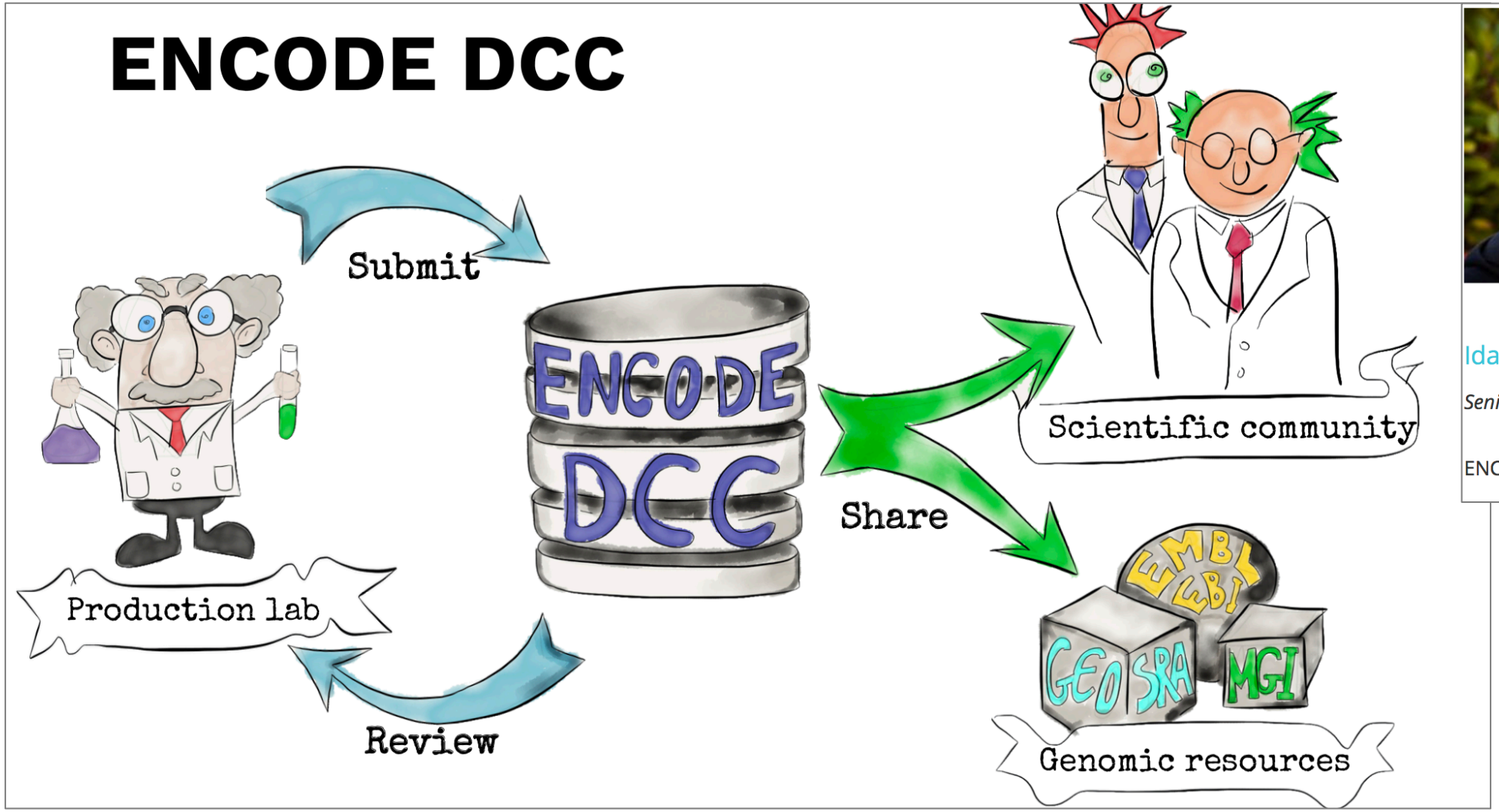
NCBI

Ben Busby

Lead, Bioinformatics Training

NCBI

National scale data collection and curation



Idan Gabdank

Senior Data Wrangler

ENCODE DCC

Evolving platforms by publishers

2. How is eLife making research components accessible and discoverable?

Bringing components together ⟶ Reproducible Document Stack

- Bring components together in a single narrative
  - Encapsulates usable code and data within the flow of a manuscript (for authors and readers)
  - Enhancement from static research article to full data and code interaction
  - Easy and accessible to everyone: connect Excel users with notebook coders

Supported by the publishing infrastructure

eLIFE substance Stencila

Maria Guerreiro

Journal development editor

eLIFE

Pros and cons about pre-printing

A debate about preprinting in my lab

vaughn 8:53 AM
hi chris and caroline, so, now that the article is submitted, how do we feel about biorxiv? You know I'm in favor, but I won't move forward unless we're unanimous

chris 11:25 AM
im in favor

caroline 12:32 PM
What do you see as the advantage of putting it on bioRxiv? Thus far I've put all my papers on bioRxiv and in my experience is that there are real drawbacks. 1. If there are any flaws that the reviewers catch, people have been reading the flawed version 2. People pay less attention when the actual paper comes out. 3. (Less likely to be important) I've had difficulty where reporters wanted to write about paper, but the journal wouldn't let me talk to them.

If it gets closer to job application season, I would see the benefits as outweighing the disadvantages, but right now it seems to me that the disadvantages outweigh the advantages.

chris 12:52 PM
advantages: 1. community has a chance to comment/improve the manuscript. 2. public can read public-funded research without paywall 3. record of productivity for CV if reviews take too long

caroline 1:17 PM
I agree with #3, which is why I would support posting the paper later. Since Evolution Letters is entirely open access, #2 isn't currently a concern, so I would support posting to bioRxiv if we get a rejection from Evolution Letters and resubmit somewhere that isn't open access. #1 is valuable, but I think it's pretty rare. I am willing to be persuaded, but I'm not convinced.

vaughn 5:15 PM
On this conversation, which is really healthy. See: http://journals.plos.org/ploscompbiol/article?id=10.1371/journal.pcbi.1005473

and: http://asapbio.org/preprint-info/preprint-faq

Vaughn Cooper

Associate Professor of Microbiology & Molecular Genetics

University of Pittsburgh

Recurring Themes
(and some favorite quotes)

Motivations and incentives

“There were microscopes that were too expensive for us …why don’t we make it ourselves and make it open source?”

“…make tools more accessible for others, and others will contribute back”

“Not just something to plug and play … we want to constantly hack into our system and modify and make change for our specific research questions”

“… but the open sources spirit caught on and bought a lot of the good will from the community”

Roles of funders and institutions

“Funders can encourage even force change in our behaviors”

“Conversation [on reward system in terms of funding] has not formally happened.”

“[NIH] should really make part of the [R01] renewal decisions on how much data is reused”

“Science always moves faster than evaluation processes, its going to change when some of us are on the other side.”

Challenges

“Data arriving at unprecedented volume, variety and velocity. Need new tools and approaches to process, analyze and interpret”

“Technology is ever evolving, need to be full time to learn all theses”

“People develop hard ware and code, but not necessarily have time to share”

“How to get grad students and postdocs the credit they need to get tenure track jobs”

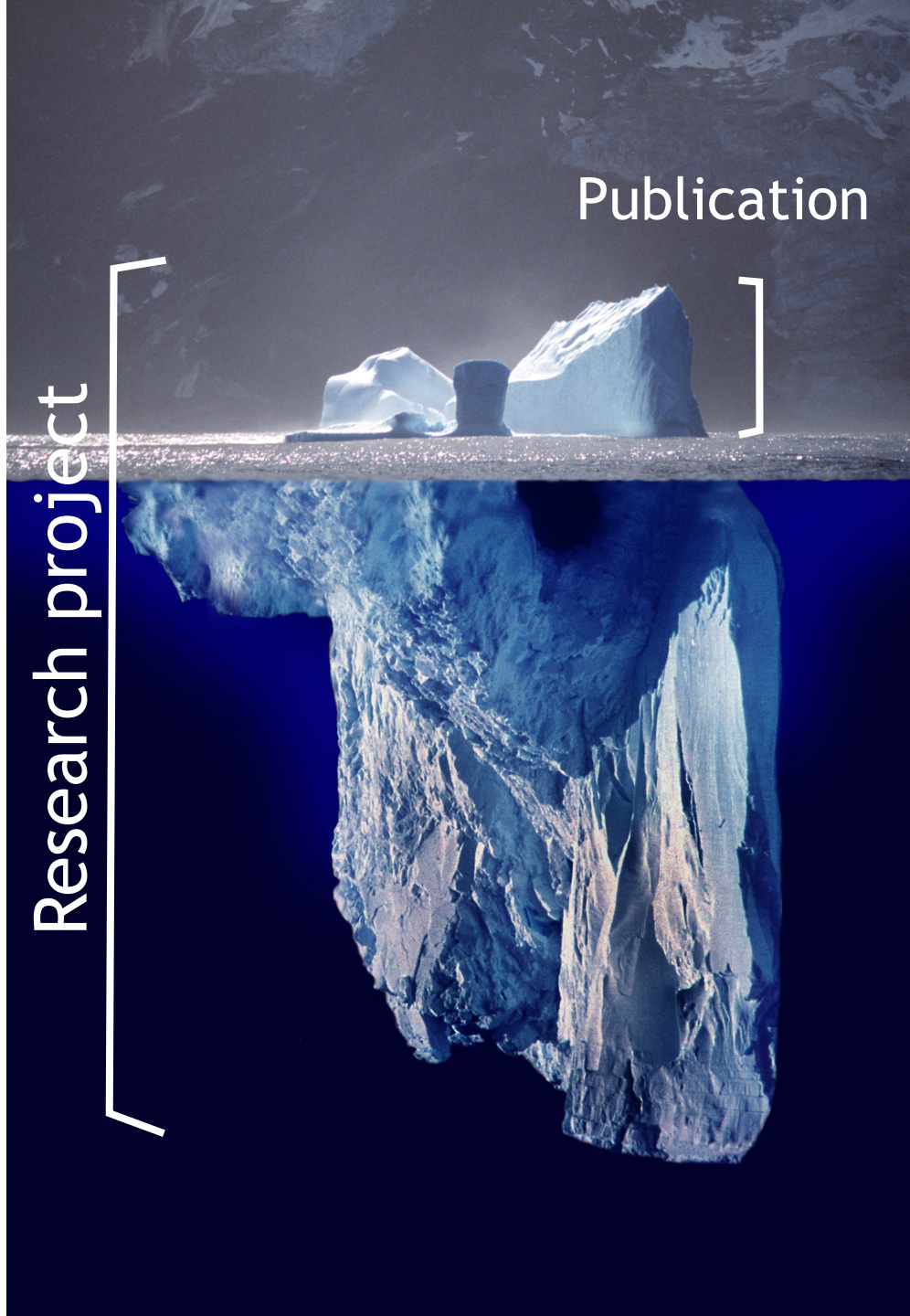
“Till we get to a point how to measure the value /reuse of data, we won’t have incentives in place”

Reproducibility

“[A research project] is like a big iceberg, the tip is what’s shown, the whole thing is all the work that happens.”

“Grabbing data via point and click is not reproducible”

“With a few lines of code, get the data …reproducibly. If data changes, just have to re-run the code”



Value of Data

“Sharing data is not useful, reusing data is useful.”

“Open access ≠ useful resources… implementation is not FAIR”

“To make data valuable is work. It’s hard to do it well.”

Metadata

“Is it worth spending the time? Yes, otherwise its not useful”

“Maintain balance of asking for enough metadata but not too much”

“Metadata standards…vary a lot by discipline. How discipline specific should we make it so its useful to genomics community but also useful for everyone else?”

“As a community we shouldn’t tolerate another data format. We need things as open, machine readable, and low level as we can possibly get”

Data ownership and privacy

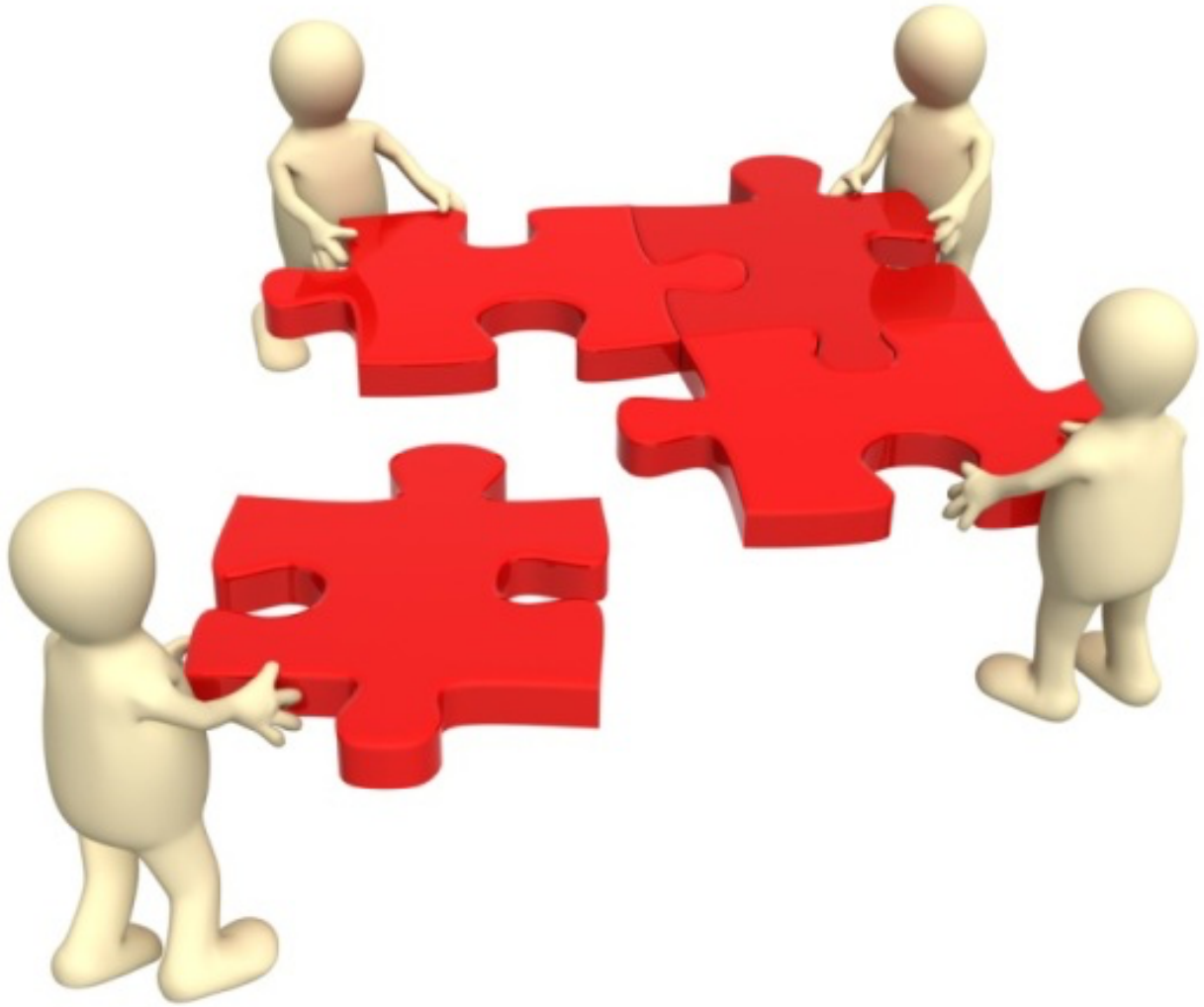
“Who owns data, code, and research outputs? When, if ever, do they expire?”

“We know its very valuable, but frankly we don’t know who owns it”

“The traditional Form of Consent comes with lots of challenges… because we don’t know how these data will be linked in the future to other data”

Moving Forward

- New collaborations among researchers
- Partnership among various stakeholders
- More open science events



software carpentry

Teaching basic lab skills for research computing

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Search...

Carnegie Mellon University

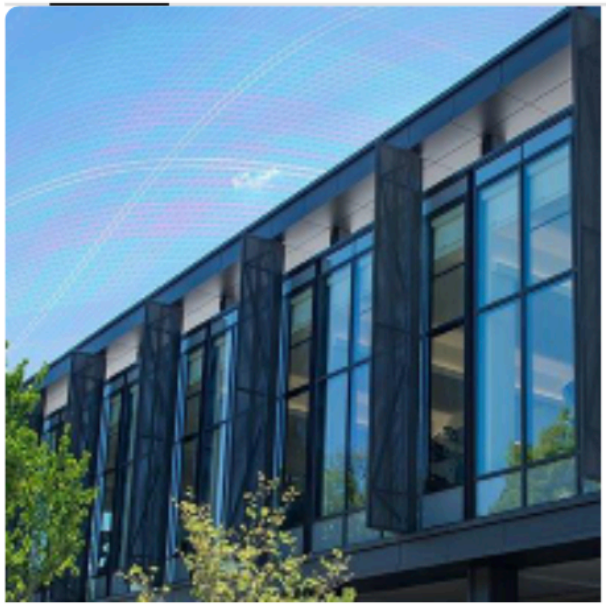
Nov 27-28, 2018

Day 1: 9:00 AM - 5:00 PM Day 2: 9:00 AM - 4:00 PM

Instructors: Dr. Rebecca Lowdon, Nathan Catlin

Helpers: Huajin Wang, Eric Kaltman

Innovation Roundtable 2018



Innovation Roundtable 2018: Collaboration Yields Powerful Research Results

- *Monday, December 3, 2018*
- *10 a.m. – 11 a.m.*
- *Cohon Campus Center, Rangos 3*
- *Register for this event: https://cmu-innovation-roundtable-2018.eventbrite.com*

Presented by Carnegie Mellon University Libraries and the Software Engineering Institute, the Innovation Roundtable brings together CMU researchers to discuss how innovation and problem solving are enhanced through cross-disciplinary collaboration.

- Automation in data discovery
- Automation in data curation and generation
- Measuring and improving data quality
- Integrating datasets and enabling interoperability
- Biomedical data discovery and reuse
- The future of scientific data and how we work together

https://events.library.cmu.edu/aidr2019/

#AIDR2019

AIDR 2019

ARTIFICIAL INTELLIGENCE FOR DATA DISCOVERY & REUSE

An NSF - Supported Conference

May 13 - 15, 2019

CARNEGIE MELLON UNIVERSITY

Carnegie Mellon University

kgw@cmu.edu
huajinw@cmu.edu

cmkeithw
HuajinBioLib