How to be a Successful Researcher?

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These slides and video recordings of this lecture are available on-line at:

http://www.cse.wustl.edu/~jain/cse591-18/

Overview

1. Ethics

2. Maximizing your Research Impact

3. Selecting Highly Ranked Conferences to Publish

4. Preparing Your Website

5. Writing Proposals: Heilmeier Catechism

Ethics

❑ Ethics: How your action affects other humans

❑ Plagiarism

❑ Authorship and Credit disputes

❑ Fabrication or falsification

❑ Compliance: Follow the laws

❑ Piracy: Using pirated software/books

Ref: ORI, "Online Research Ethics Course," https://ori.hhs.gov/education/products/montana_round1/research_ethics.html

Ref: Inst of Medicine, National Research Council, "Integrity in Scientific Research Creating an Environment That Promotes Responsible Conduct," 2002, https://download.nap.edu/cart/download.cgi?record_id=10430

http://www.cse.wustl.edu/~jain/cse591-18/

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Plagiarism

❑ Copying text or figures without attribution/permission

❑ Unauthorized use of ideas or unique methods obtained during grant/manuscript review

❑ IEEE now uses **iThenticate** to check plagiarism

❑ Self-plagiarism: Using the same text/figure in multiple papers. When republishing, it is best to refer to earlier publication(s)

❑ ORI has a number of Photoshop applications (droplets) that help determine copyright violations in images.

Ref: ORI, "ORI Policy on Plagiarism," https://ori.hhs.gov/ori-policy-plagiarism

Ref: M. Roig, "Avoiding plagiarism, self-plagiarism, and other questionable writing practices: A guide to ethical writing," 2015, 71 pp., https://ori.hhs.gov/sites/default/files/plagiarism.pdf

Ref: ORI, "Forensic Tools," https://ori.hhs.gov/forensic-tools

Authorship Disputes

❑ Disputes arise when collaborators go their own ways and publish

❑ Establish written agreements before involving or taking help of other members of the lab or collaborators

❑ Document contributions. Sometimes, a section at the end of the paper documents contributions of various authors, e.g., "X did the measurements. Y helped in reviewing and interpreting the results. The work was done under the supervision of Prof. Z"

❑ All authors should approve the manuscript including the order of the author names

Ref: ORI, "Authorship practices to avoid conflicts,"
https://ori.hhs.gov/sites/default/files/2018-09/Authorship%20Practices%20to%20Avoid%20Conflicts_Rasterized.pdf

http://www.cse.wustl.edu/~jain/cse591-18/

Falsification or Fabrication

❑ All authors, particularly, the supervisor need to ensure that data reported is correct.

❑ Careers of all authors are on the line.

❑ A Duke University researcher published that a certain gene signatures predicted the response to chemotherapy
$\Rightarrow$ National Institutes of Health put extra requirements on **all** Duke researchers that receive federal funds.

❑ The Office of Research Integrity (ORI) of the US Dept of Health and Human Services (DHHS) lists numerous cases where researchers were caught for misconduct (9 cases in 2018)

Ref: A. McCook, "Duke's mishandling of misconduct prompts new US Government grant oversight," Mar 23, 2018, http://www.sciencemag.org/news/2018/03/duke-s-mishandling-misconduct-prompts-new-us-government-grant-oversight

Ref: ORI, "Case Summaries," https://ori.hhs.gov/content/case_summary

http://www.cse.wustl.edu/~jain/cse591-18/

Reviewer Ethics

❑ Do not review paper/proposal if you can not give an unbiased opinion

  ➢ Papers authored by your relatives/colleagues/close friends

  ➢ Always tell the editor about the conflicts if any.

❑ Cannot use the results/ideas of the paper/proposal in your own research until the results of the proposer/author are published

❑ If you have a simple extension or enhancement, write that in your review. The authors may acknowledge it.

Ref: L. Fortnow, "Reviewer Ethics," April 9, 2006, https://blog.computationalcomplexity.org/2006/04/reviewer-ethics.html

http://www.cse.wustl.edu/~jain/cse591-18/

Examples of Misconduct

❑ A student uses slides of his/her professor without attributing the source of the slides.
  (Professor may be suspected of misconduct.)

❑ A student copied 3 chapters of a published book and submitted as his project paper

❑ A student copied one entire paper and submitted it as her project report

❑ A group of students copied one entire paper and republished it with their names as authors with the same/new title.

❑ In School of Engineering and Applied Sciences (SEAS) at WUSTL, all misconduct must be reported to the deans office.

Maximizing Your Research Success

1. Your Research Impact
2. Author/Researcher's Rankings
3. Selecting Conferences to Publish
4. Conference/Journal Rankings
5. Paper Repositories/Archives

Research Impact Metrics

❑ Impact of all research is measured by citations
  ⇒ Researchers are measured by citation counts

❑ H-Index: *h* papers have at least *h* citations each

❑ I10-Index: Number of papers with at least 10 citations

❑ Last 5-years show current activity

❑ Example Profile from Google Scholar:

	All	Since 2013
Citations	29293	8696
h-index	59	32
i10-index	188	83

Author/Researcher's Rankings

❑ AMiner Most Influential Scholar Annual List, https://aminer.org/mostinfluentialscholar (based on ACM SIGCOMM conferences)

❑ Guide2Research, "Top H-Index for Computer Science and Electronics," http://www.guide2research.com/scientists/

Finding Literature: Search Points

Papers:

❑ Google Scholar, http://scholar.google.com/

❑ IEEE xplore, http://ieeexplore.ieee.org/

❑ WUSTL Library Catalog, http://library.wustl.edu/
http://library.wustl.edu/findart.html

❑ ACM Digital Library, http://portal.acm.org/dl.cfm

Books:

❑ WUSTL Library Catalog, http://library.wustl.edu/

❑ MOBIUS (Missouri Library Consortium),
http://searchmobius.org

❑ WorldCat (Search libraries across the world),
http://www.worldcat.org/

Search Points (Cont)

❑ ILLIAD (Inter-Library Loan),
https://illiad.wustl.edu/illiad/logon.html

❑ eBooks at WUSTL:
https://libguides.wustl.edu/c.php?g=47302&p=303315

❑ Safari Books, https://one.wustl.edu/task/all/safaribooks (12,000 full-text eBooks. Allows searching through books)

❑ Knovel Books, https://libguides.wustl.edu/engineering

❑ Google Books, http://books.google.com (allows searching through books)

❑ Amazon (Read the reviews and table of contents and then check WUSTL library/eBook catalog)

❑ Lecture Notes in Computer Science (Springer),
http://www.springerlink.com/content/105633/

Selecting Conferences to Publish

❑ Select the journal or conference with a high impact factor

❑ Generally, conferences with lower acceptance rates are considered better

❑ Your goal is to maximize citation count

❑ Citation count depends on:

➢ Conference: 13%

➢ Keywords in the title: 9.3%

➢ Year of publication: 9.3% (older papers get more citations)

➢ Interactions among above: 45.7%

❑ Workshops and posters are lower quality than the papers published in the conferences. However, the distinction is often lost by the search engines, even IEEE xplore.

Ref: Utkarsh Goel, Clemente Izurieta, Mike P. Wittie. "Understanding Factors Influencing the Citation Count of Networking Conference Papers" in ISCA Software Engineering and Data Engineering (SEDE), October 2015, https://www.cs.montana.edu/mwittie/publications/Goel15Understanding.pdf

Finding Conferences to Publish

- **Guide2research**, http://www.guide2research.com/conferences/ (You can search for any area/any publisher. Lists by deadlines)
- IEEE Computer Society Conference Calendar, https://www.computer.org/web/conferences/calendar
- IEEE Communications Society Conference Calendar, https://www.comsoc.org/conferences/conferencesearch
- ACM Conference Calendar, http://www.acm.org/events/
- SIAM Conference Calendar, http://www.siam.org/meetings/calendar.php
- DBLP Conference List, http://www.informatik.uni-trier.de/~ley/db/conf/index.a.html
- Wikipedia, "List of computer science conferences," https://en.wikipedia.org/wiki/List_of_computer_science_conferences

Conference Rankings

❑ Google Scholar Metrics, https://scholar.google.com/citations?view_op=top_venues&hl=en

  ➢ H5-Index: h papers published in the last 5 years have at least h citations each
  ➢ H5-median: Median # of citations that make up the h5-index
  ➢ You can look up any conference there. 1st place to look.

❑ Guide2Research, "Top Computer Science Conferences" http://www.guide2research.com/topconf/

❑ WikiCFP, "Call for Papers of Conferences, Workshops, and Journals," http://www.wikicfp.com/cfp/allcfp

❑ Microsoft Academic Search Rankings, http://academic.research.microsoft.com/RankList?entitytype=3&topDomainID=2&subDomainID=0

Conference Rankings (Cont)

- Citeseer, "Networking Conferences Statistics," http://citeseer.ist.psu.edu/impact.html
- CORE Conference Rankings, http://www.core.edu.au/index.php/conference-rankings
- Core Computer Science Conference Rankings Descriptions, http://www.core.edu.au/documents/RankingDescriptions2014.pdf
- ERA Conference Rankings, http://lamp.infosys.deakin.edu.au/era/?page=cmain
- GII-GRIN-SCIE (GGS) Conference Rating, http://valutazione.unibas.it/gii-grin-scie-rating/files/GII-GRIN-SCIE-Conference-Rating-30-mag-2018-11.54.45-Output.xlsx
- Chinese Ranking of International Conferences in Computer Science (Recommended by China Computer Society 2015), http://web.engr.illinois.edu/~shossen2/CSRanking.html

http://www.cse.wustl.edu/~jain/cse591-18/

Conference Rankings (Cont)

❑ AMiner, "Conference Rank," https://aminer.org/ranks/conf

❑ Conference Ranks, http://www.conferenceranks.com/

❑ Balise Genest, "Conference Ranking," https://perso.crans.org/~genest/conf.html

❑ Q. Zou, "Computer-Science Conference Rankings (full)," https://sites.google.com/site/qinzoucn/conferences/conference-ranking-full

❑ O. R. Zaiane, "Computer Science Conference Rankings," http://www.cs.ualberta.ca/~zaiane/htmldocs/ConfRanking.html

❑ R. Li, "Computer Science Conference Rankings," http://idc.hust.edu.cn/~rxli/csrank.htm

Conference Rankings (Cont)

❑ Kevin C. Almeroth, "Networking Conferences Statistics," https://www.cs.ucsb.edu/~almeroth/conf/stats/

❑ Database Systems Lab. Computer Science Conference Rankings, http://dsl.serc.iisc.ernet.in/publications/CS_ConfRank.htm

❑ Guofei Gu, "Computer Security Conference Ranking and Statistic," http://faculty.cs.tamu.edu/guofei/sec_conf_stat.htm

❑ T. Chen, "Computer Science Department Conference Rankings, http://www.cs.jhu.edu/~taochen/SoC_Conference_Ranking.html

❑ C. Prichard, C. Scopel, M. Hill, G. Sohi, and D. Wood, "Architecture conference stats" (last updated 2013), http://www.cs.wisc.edu/~markhill/AcceptanceRates_and_PCs.xls

Conference Rankings (Cont)

❑ Ashkan Yousefpour, "Fog and Edge Computing Conferences and Journals," https://anrlutdallas.github.io/resource/projects/fog-computing-

❑ Florian Sikora, "Acceptance ratio of some Theoretical Computer Science Conferences," http://www.lamsade.dauphine.fr/~sikora/ratio/confs.php

❑ P. Apers and C.S. Jensen, "Database Conference Acceptance Rates," https://fusiontables.google.com/DataSource?dsrcid=514/514#rows:id=1

❑ M.E. Fayad, " Computer Science Conference Rankings," http://www.engr.sjsu.edu/fayad/Research-Fayad/docs/docs/Computer%20Science%20Conference%20Rankings.doc

Journal Rankings

❑ Guide2Research, "Top Journals for Computer Science and Electronics," http://www.guide2research.com/journals/

❑ **Guide2Research**, "Special Issues of Computer Science and Electronics Journals," http://www.guide2research.com/special-issues/ (Sorted by upcoming deadlines)

❑ Core Journal Portal, http://portal.core.edu.au/jnl-ranks/

❑ SJR: Scientific Journal Rankings, https://www.scimagojr.com/journalrank.php

Paper Repositories/Archives

Lookup Your Papers in:

- Google Scholar, https://scholar.google.com/
  (Create your profile)
- Microsoft Academic Archive, https://academic.microsoft.com
  (Make sure to claim all your papers)
- PubMed, http://www.ncbi.nlm.nih.gov/pubmed/

Upload your papers to:

- Researchgate, https://www.researchgate.net/
- Academia.edu, https://www.academia.edu/
- ArXiv, https://arxiv.org/
- DBLP, http://www.informatik.uni-trier.de/~ley/db/index.html
- CiteSeerX, http://citeseerx.ist.psu.edu/

Paper Repositories/Archives (Cont)

❑ Washington University Open Scholarship, https://openscholarship.wustl.edu/

❑ Other open access repositories, https://libguides.wustl.edu/c.php?g=47296&p=303288

❑ LinkedIn, https://www.linkedin.com/ (upload your papers to your profile)

❑ Your own website. Provide useful info so others link to it $\Rightarrow$ Increase your PageRank

Preparing Your Website

❑ Use plain text editors with simple html

❑ Do not use HTML generated by MS Word. It will not pass any HTML validation test. Save the word file as plain text and add HTML tags.

❑ Learn to use special characters in text and reference URLs. See

➢ http://www.w3schools.com/tags/ref_urlencode.asp

➢ https://perishablepress.com/stop-using-unsafe-characters-in-urls/

❑ HTML5 only

Header

```
<!DOCTYPE html>
<html lang="en">
<head>
<title>
<meta name="Author"
<meta name="robots"
<meta name="Keywords"
<meta name="Description"
</head>
```

Body

<body>

<h1>Title</h1>

<B>Author</B>, Permanent-Email

<h2>Abstract:</h2>

...

Body (Cont)

<h2>Table of Contents:</h2>

2. 10-Gigabit Ethernet Overview

2.1 Benefits of 10-Gigabit Ethernet

...

<hr>

Body (cont)

<h2>Introduction</h2>

...

<p>[Grow99]

<p>

...

Homework 2

❑ Prepare a short webpage (written manually) using most of the tags indicated in this handout

❑ Include at least one image/photo in the page

❑ Validate the page using:

   ➢ https://validator.w3.org/nu/

   ➢ https://www.freeformatter.com/html-validator.html

   ➢ Check the Google-friendliness of the page: https://varvy.com/

❑ Submit the html source file printout as a pdf attachment via email to jain@wustl.edu with the subject "CSE 591 Homework 3"

❑ Due Date: September 17, 2018.

❑ Remember:

   ➢ To add all meta tags specified in the handout

   ➢ Validate the page

   ➢ Use WUSTL's ad-free area

WUSTL Engineering Student Webpages

❑ Copy your files to your WUSTL directory:

For Mac: (all on one line)

❑ scp your_html_file *your_wustl_key*@shell.cec.wustl.edu:/project/websites/cse591_fl18/*your_wustl_key*

❑ E.g., scp index.html jain@shell.cec.wustl.edu:/project/websites/cse591_fl18/jain

❑ Access your webpage from the browser:

http://students.cec.wustl.edu/cse591_fl18/*your_wustl_key/*

For Windows:

❑ Use Putty app from the following link then follow the same steps as Mac:

https://www.chiark.greenend.org.uk/~sgtatham/putty/latest.html

Common Mistakes in Homework 2

❑ Not using parameters for meta tags

❑ Not validating

http://www.cse.wustl.edu/~jain/cse591-18/

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Institution Rankings

❑ CSRankings: Computer Science Rankings,
http://csrankings.org/#/index?all

❑ QS, "World University Rankings,"
https://www.topuniversities.com/university-rankings
See also
https://en.wikipedia.org/wiki/QS_World_University_Rankings#QS_Graduate_Employability_Rankings

❑ ARWU Shanghai Ranking,
https://www.statista.com/statistics/226665/academic-ranking-of-world-universities/

Institution Rankings (Cont)

❑ Forbes, "America's Top Colleges" https://www.forbes.com/top-colleges (Paid)

❑ Times Higher Education, "World University Rankings," https://www.timeshighereducation.com/world-university-rankings/2018/world-ranking (paid)

❑ USnews, "National University Rankings," https://www.usnews.com/best-colleges/rankings/national-universities (paid)

Writing Proposals: Heilmeier Catechism

❑ Was Director of US Defense Advanced Project Agency (DARPA)

❑ Answer the following questions in your proposals (papers?)

1. What are you trying to do? State goals w/o jargon.
2. How is it done today and what are the limits of current practice?
3. What's new in your approach, and why do think it will be successful?
4. Who cares? (Who will benefit?)
5. If you are successful, what difference will it make?
6. What are the risks and payoffs?
7. How much will it cost?
8. How long will it take?
9. What are the midterm and final exams to check for success? (Milestones)

Ref: Wikipedia, "George H. Heilmeier," https://en.wikipedia.org/wiki/George_H._Heilmeier

Writing Proposals (Cont)

❑ A sample NSF proposal that was funded,
http://www.cse.wustl.edu/~roger/591.f15/ProposalNSF-CSR15.pdf

NSF Graduate Research Fellowship

❑ Supports graduate students for MS and PhD in Science, Technology, Engineering, and Math (STEM)

❑ $34,000/year for 3 years + $12000/year for tutition and fees to the institution

❑ 50,000 awards from 500,000 applicants since 1952

❑ Very prestigious:

  ➢ Past recipient include Google founder Sergey Brin

  ➢ 42 fellows won the Nobel prize

❑ Apply before or during the first year of graduate study

❑ US Citizens or permanent residents only

Homework 3

❑ Review 2 papers from top conferences in your area of interest

❑ See detailed homework handout

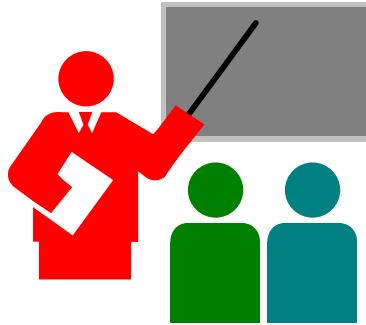❑ Due Date: September 24, 2018

2. Bring it to Completion

❑ Step 1: Analyze/develop new algorithm/idea

 ➢ Make most of your time – don't throw it in dustbin

❑ Step 2: Publish

 ➢ Required for the annual review. But don't stop here

Publication is not the End Goal

❑ Every person is a company. Companies need:
  1. Product Idea
  2. Engineering
  3. Marketing
  4. Sales

❑ Measure success by adoption. Publication ≠ Sales

❑ Bring it to standard bodies: IETF/IEEE/ITU

❑ Implement and open source

❑ Productize: SDN (Nicira) by Casado, Mckeown, …

Summary

1. Ethics in research is important. Avoid any plagiarism, conflicts,…

2. Publish in high ranking journals and conferences and make your work easily accessible to others

3. Your goal is to help others adopt your research $\Rightarrow$ Publication is not the end goal

4. Nine questions that must be answered in every proposal: Heilmeir catechism

Additional References

- D.S. Touretzky, "Ethics and Etiquette in Scientific Research," April 2007, 64 slides, http://www.cs.cmu.edu/~dst/Ethics/ethics07.pdf

- DHHS, "Public Health Service Policies on Research Misconduct; Final Rule" 42 CFR Parts 50 and 93, May 17, 2005, 17 pp., http://ori.dhhs.gov/documents/42_cfr_parts_50_and_93_2005.pdf

- National Academy of Science, "Adviser, Teacher, Role Model, Friend: On Being a Mentor to Students in Science and Engineering," 96 pp, ISBN 978-0-309-06363-0, DOI 10.17226/5789, https://download.nap.edu/cart/download.cgi?record_id=5789

- National Academy of Sciences, "On Being a Scientist: A Guide to Responsible Conduct in Research: Third Edition," 82 pp., ISBN 978-0-309-11970-2, DOI 10.17226/12192, https://download.nap.edu/cart/download.cgi?record_id=12192

Additional References (Cont)

- Basic Research Concepts for New Research Staff," https://ori.hhs.gov/sites/default/files/Basic%20Research%20Concepts%20for%20New%20Research%20Staff.zip

- Eugene Garfield. Journal impact factor: a brief review. Canadian Medical Association Journal, 161(8):979–980, 1999, http://www.garfield.library.upenn.edu/papers/journalimpactCMAJ1999.pdf

- Paul J Haensly, Paul E Hodges, and Shirley A Davenport, "Acceptance rates and journal quality: An analysis of journals in economics and finance," Journal of Business & Finance Librarianship, 14(1):2–31, 2008, https://www.tandfonline.com/doi/abs/10.1080/08963560802176330

- E. Susanna Cahn, "Journal Rankings: Comparing Reputation, Citation and Acceptance Rates," *Int. J. Inf. Syst. Serv. Sect.* 6, 4 (October 2014), 92-103, http://dx.doi.org/10.4018/ijisss.2014100106

Acronyms

- AI   Artificial Intelligence
- DARPA   Defense Advanced Project Agency
- DOI   Document Identifier
- HCI   Human Computer Interface
- HTML   Hypertext Markup Language
- ID   Identifier
- IoT   Internet of Things
- IP   Intellectual Property
- ISBN   International Standard Book Number
- ISCA   International Society for Computers and their Applications
- IT   Information Technology
- KB   Kilo-Byte
- ML   Machine Learning
- RFCs   Request for Comments
- SEDE   Software Engineering and Data Engineering
- URL   Uniform Resource Locators

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http://rajjain.com