High Quality Research to High Impact Journal Publication

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“He didn’t publish, so he perished.”
Growing Expectations of Research Productivity

Piled Higher and Deeper by Jorge Cham

HOW PROFESSORS SPEND THEIR TIME

- How they actually spend their time:
  - Teaching: 59%
  - Research: 18%
  - Service: 23%

- How departments expect them to spend their time:
  - Teaching: 20%
  - Research: 175%
  - "Service": 20%

- How Professors would like to spend their time:
  - Don't tell me what to do

Source: Higher Education Research Institute Survey (1999)

www.phdcomics.com
Research Quality Vs. Publication

• There is more emphasis on publication count rather than publication quality

• Driven by academic “bean counting”; simple to evaluate research output (quantity) than research quality

• Self assessment
  – Have you publications made a difference?
  – Which publication are you most proud of?
**h-Index**

- The *h-index* attempts to measure both the productivity and impact of the published work of a scientist.
- A scholar with an index of *h* has published *h* papers each of which has been cited in other papers at least *h* times.
- *h-index* may provide misleading information about a scientist's output: e.g., no. of authors in the paper, context of citation, ..

http://en.wikipedia.org/wiki/H-index
Impact Factor

• The **impact factor** (IF) of a journal reflects the average number of citations to recent articles published in the journal. It indicates the relative importance of a journal within its field.

• In a given year, IF of a journal is the average number of citations per paper published in that journal during the two preceding years.

• Journal can adopt policies to increase its IF, e.g., it may publish more review articles which generally are cited more than research papers.

Choosing the Right Journal

Which comes first: the journal or the paper?

*The Charlesworth Group*
Subject Area Influence on Impact Factors

- Fundamental Life Sciences
- Neuroscience
- Clinical Medicine
- Pharmacology & Toxicology
- Physics
- Chemistry & Chemical Engineering
- Earth Sciences
- Environmental Sciences
- Biological Sciences
- Materials Science & Engineering
- Social Sciences
- Mathematics & Computer Sciences

Mean Impact Factor (1998)

"How to write a Great Research Paper and Get it Accepted by a Good Journal", Anthony Newman, Elsevier
<table>
<thead>
<tr>
<th>Rank</th>
<th>Journal</th>
<th>IF</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>IEEE COMMUN SURV TUT</td>
<td>6.311</td>
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<tr>
<td>2</td>
<td>IEEE T PATTERN ANAL</td>
<td>4.908</td>
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<tr>
<td>3</td>
<td>J CHEM INF MODEL</td>
<td>4.675</td>
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<td>4</td>
<td>SIAM J IMAGING SCI</td>
<td>4.656</td>
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<tr>
<td>5</td>
<td>ACM COMPUT SURV</td>
<td>4.529</td>
</tr>
<tr>
<td>6</td>
<td>MIS QUART</td>
<td>4.447</td>
</tr>
<tr>
<td>7</td>
<td>MED IMAGE ANAL</td>
<td>4.424</td>
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<tr>
<td>8</td>
<td>INT J NEURAL SYST</td>
<td>4.284</td>
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<tr>
<td>9</td>
<td>IEEE T FUZZY SYST</td>
<td>4.260</td>
</tr>
<tr>
<td>10</td>
<td>J STAT SOFTW</td>
<td>4.010</td>
</tr>
</tbody>
</table>

- In CS there are many conferences with higher IF than most journals
- IF is just one number, so it alone does not indicate quality of a paper

http://www.spinellis.gr/blog/20120703/
Journals With the Highest IF

• New England Journal of Medicine (IF: 53.48)
• Nature Reviews Molecular Cell Biology (IF: 38.65)
• The Lancet (IF: 33.63)
• Chemical Reviews (IF: 33.04)
• Nature (IF: 31.43)
• Science (IF: 31.36)
• Cell (IF: 31.25)
• Abstracts of Papers - American Chemical Society (IF: 31.00)
• Nature Genetics (IF: 30.26)
• Nature Reviews Immunology (IF: 30.01)

No. of Citations vs. Journal IF

- Publication in a high impact journal will gain you recognition and visibility by your peers.
- But, publication (research) quality is not necessarily the same as the quality (Impact Factor) of the journal where it is published.
- Not all papers published in high Impact Factor journals have a large number of citations.
<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Article Title</th>
<th>No. of Citations (Google scholar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GR Cross and AK Jain</td>
<td>Markov random field texture models</td>
<td>1275</td>
</tr>
<tr>
<td>KS Pal and RA King</td>
<td>On edge detection of X-ray images using fuzzy sets</td>
<td>275</td>
</tr>
<tr>
<td>CP Chen and T Pavlidis</td>
<td>Segmentation by texture using correlation</td>
<td>138</td>
</tr>
<tr>
<td>GW Milligan, SC Soon and LM Sokol</td>
<td>The effect of cluster size, dimensionality, and the number of clusters on recovery of true cluster structure</td>
<td>129</td>
</tr>
<tr>
<td>Ramesh Jain</td>
<td>Direct computation of the focus of expansion</td>
<td>104</td>
</tr>
<tr>
<td>YX Gu, QR Wang and CY Suen</td>
<td>Application of a multilayer decision tree in computer recognition of Chinese characters</td>
<td>66</td>
</tr>
<tr>
<td>CC Geschke</td>
<td>A system for programming and controlling sensor-based robot manipulators</td>
<td>50</td>
</tr>
<tr>
<td>John Fairfield</td>
<td>Segmenting dot patterns by Voronoi diagram concavity</td>
<td>31</td>
</tr>
<tr>
<td>PS Wang</td>
<td>Hierarchical structures and complexities of parallel isometric languages</td>
<td>29</td>
</tr>
<tr>
<td>WI Grosky and R Jain</td>
<td>Optimal quadtrees for image segments</td>
<td>26</td>
</tr>
<tr>
<td>R Mohr and R Bajcsy</td>
<td>Packing volumes by spheres</td>
<td>24</td>
</tr>
<tr>
<td>C Gritton and EA. Parrish</td>
<td>Boundary location from an initial plan: The bead chain algorithm</td>
<td>18</td>
</tr>
<tr>
<td>RA Finkel and JP Fishburn</td>
<td>Improved speedup bounds for parallel alpha-beta search</td>
<td>18</td>
</tr>
<tr>
<td>AH Feiveson</td>
<td>Classification by thresholding</td>
<td>16</td>
</tr>
<tr>
<td>K Preston</td>
<td>Gray level image processing by cellular logic transforms</td>
<td>10</td>
</tr>
<tr>
<td>GD Riccia and A Shapiro</td>
<td>Fisher discriminant analysis and factor analysis</td>
<td>9</td>
</tr>
<tr>
<td>PA Lavin</td>
<td>Restoration of a Feature Closed Class of Two-Dimensional Images</td>
<td>1</td>
</tr>
</tbody>
</table>
Research Process

1. Reasons for wanting to do research
2. Acquire strong analytical skills and commitment
3. Find a research topic you like
4. Understand the background or what has been done
5. Identify a problem which is likely to make an "impact"
6. Come up with an “elegant” solution
7. Find a suitable journal to publish
Research is Hard

• Good problem is difficult to find
  – Problem in a new area better than in a “beat up” area

• Too many background papers to read
  – How to filter good papers from marginal papers

• Frustration
  – Long periods with no progress

• Time crunch
  – Others may also be working on the same problem

• Writing the paper
  – Takes at least as much time as solving the problem
  – Review process less than perfect
Writing a Good Paper

• Why publish?
  ▪ Disseminate knowledge
  ▪ Degree requirement
  ▪ Job security

• Structure of the paper
  – State the problem and its importance
  – Proposed solution and how it is different
  – Design of experiments and results
  – How do the results advance state of the art?
  – Future work and suggested extensions
  – Bibliography/References
Writing a Good Paper: Be Your Own Critic

- Title should be informative and concise
- A clear & concise abstract will keep the reader engaged
- Paper should contain a clear and useful scientific message
- It should have a logical flow
- Introduction should emphasize the importance of your work
- Provide sufficient details so the results can be reproduced
- How would you rate this paper if you were the reviewer?
- Well-written paper with solid content receives good reviews
Plagiarism

- **Plagiarism** is copying of another author's "language, thoughts, ideas, or expressions," and claiming them as one's own original work.
- Plagiarism by students, professors, or researchers is considered academic dishonesty or fraud.
- Need to educate students about consequences of plagiarism and proper way to cite other's work.
Summary

• Ingredients for good research:
  – Choice of problem
  – Strong skills
  – Passion and persistence

• Convert good research to a good paper

• Journal should match paper’s topic and quality

• Review cycle can be frustrating

• Effort is worth it when the paper gets accepted
“Work on the right problem, at the right time, and in a right way”

Richard Hamming “You and Your Research”
https://www.cs.virginia.edu/~robins/YouAndYourResearch.html
https://www.youtube.com/watch?v=a1zDuOPkMSw
I was just rubbing sticks together for fun - I didn't realize I was doing basic research.
WHAT'S FREAKING US OUT HERE IS THAT WE'VE FOUND A CORRELATION BETWEEN OWNING CATS AND BEING STRUCK BY LIGHTNING.