Engineering Subject Areas Vary in Coverage by Google Scholar

John J Meier

Pennsylvania State University

Question

- Can Google Scholar be recommended as a resource for searching the Engineering literature?

- How does it compare to licensed databases?
  - ✓User interface of Google Scholar – research existed
  - ✓Content – research existed for other disciplines

Original Study

- Search Google Scholar for bibliographic results from Compendex by decade from 1950-2007 in eight separate subject areas
- Samples obtained by keyword searching Compendex
- Title and/or Author searches were conducted in Google Scholar

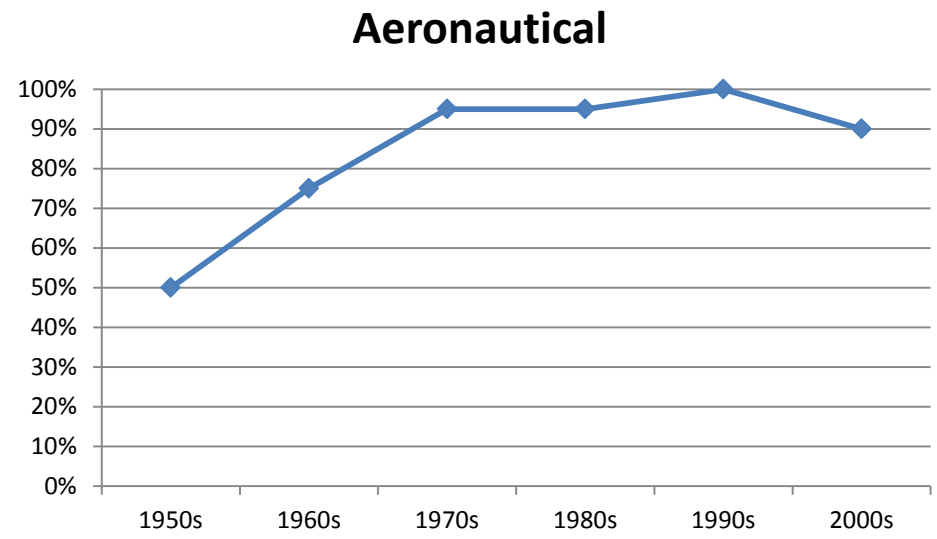
Original Study

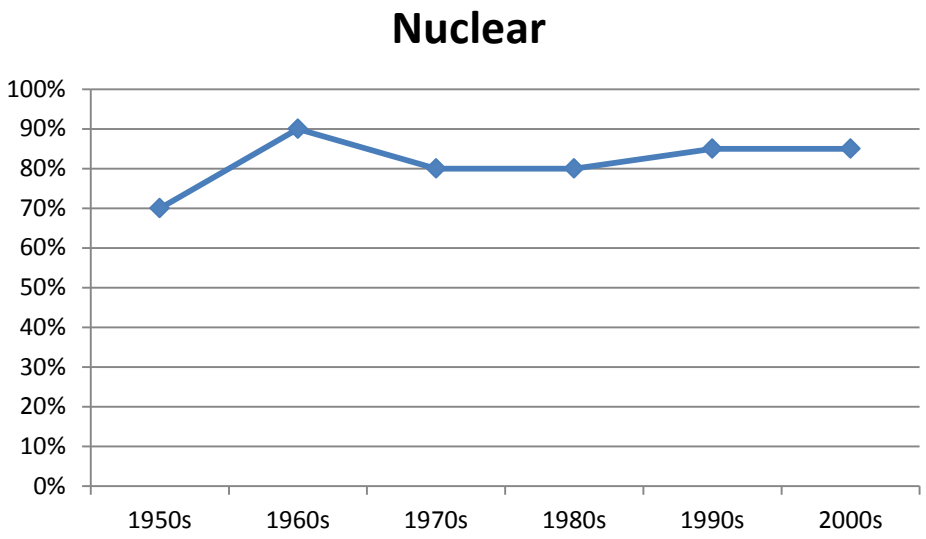
- Percentage of records discoverable in Google Scholar increased over time in all subjects, approaching 90% in the last two decades.

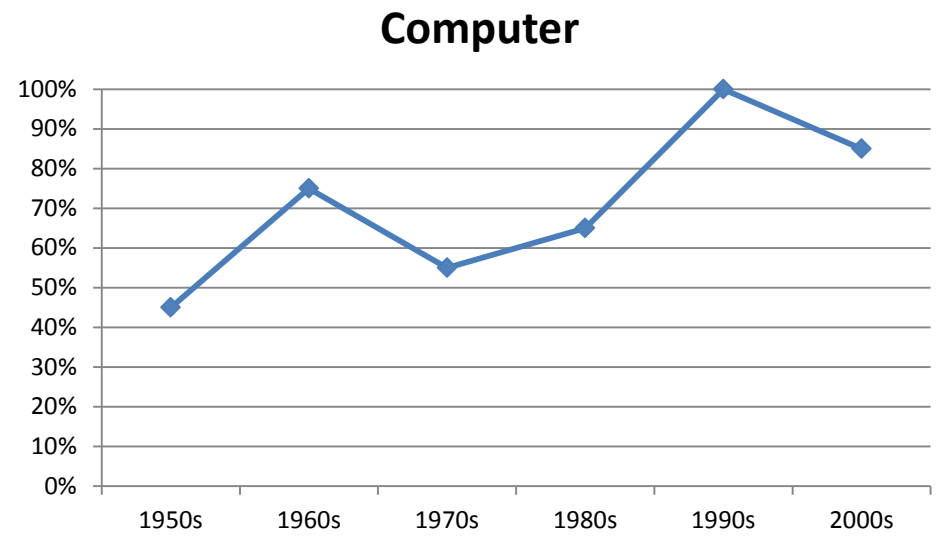
- Specific results originally published in

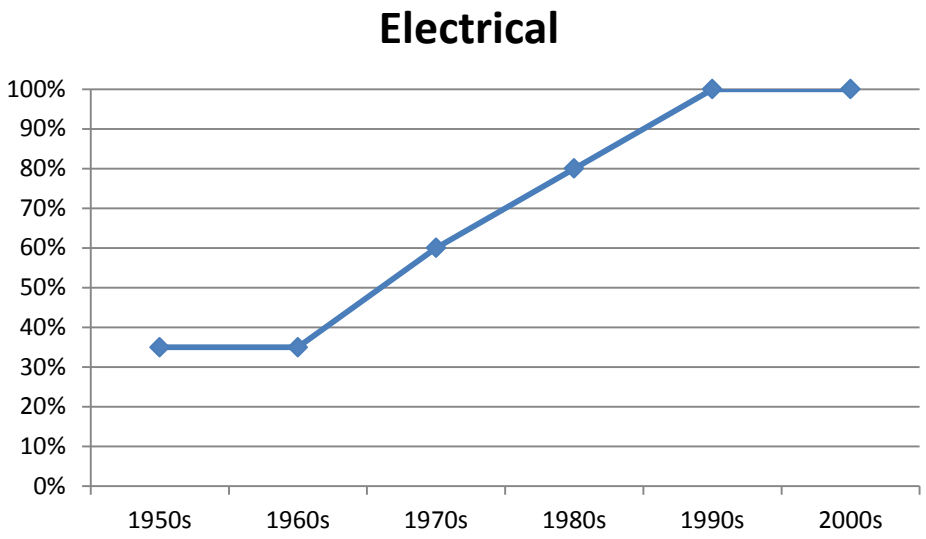
Meier, J. and Conkling, T. “Google Scholar’s Coverage of the Engineering Literature: An Empirical Study.” *The Journal of Academic Librarianship.* Volume 34, Issue 3, May 2008 [doi:10.1016/j.acalib.2008.03.002]

Subjects with the best results

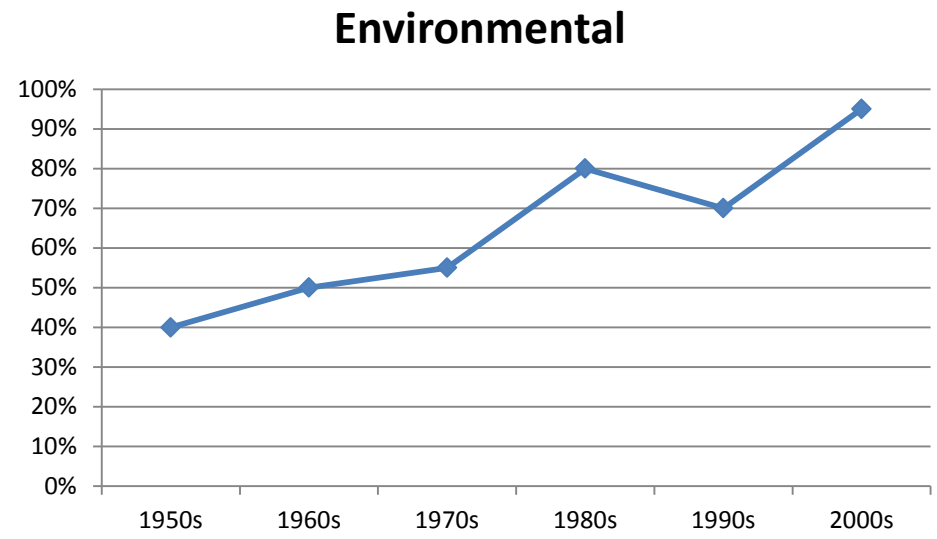


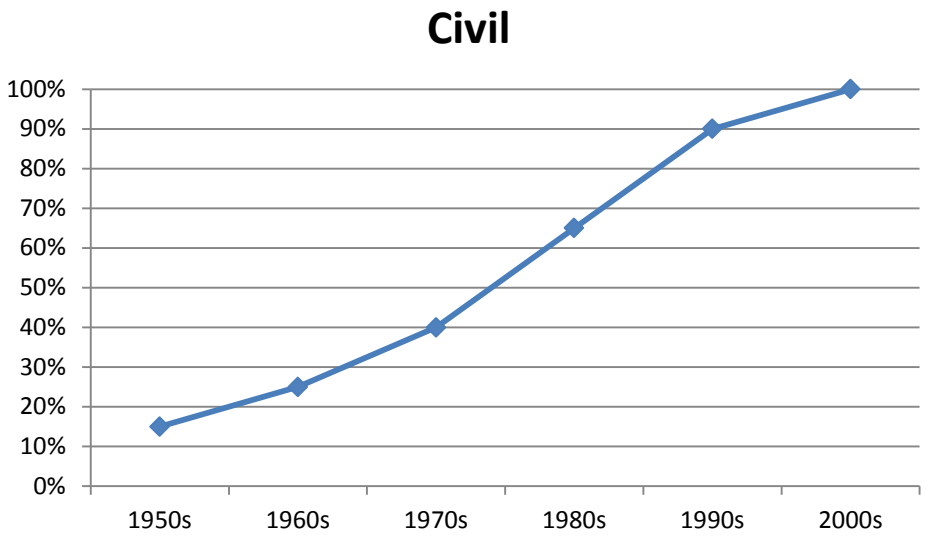


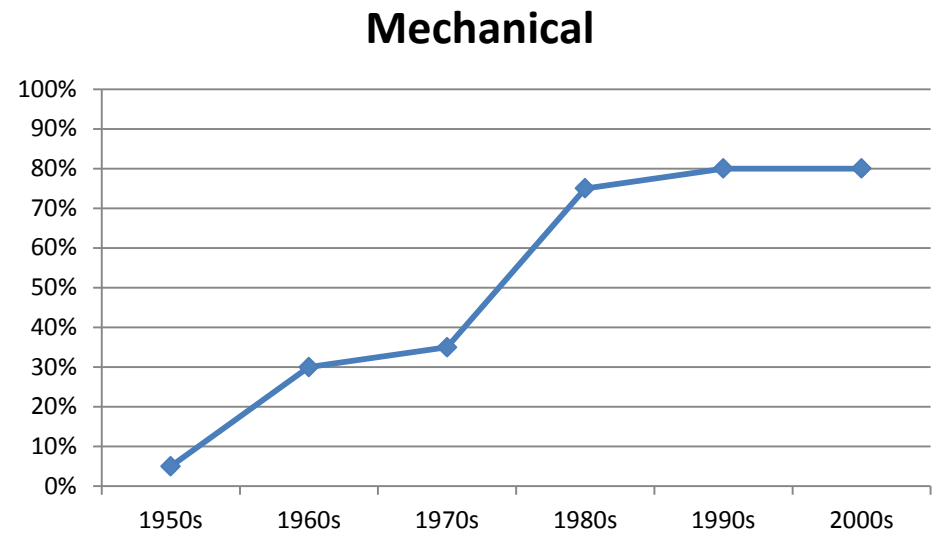


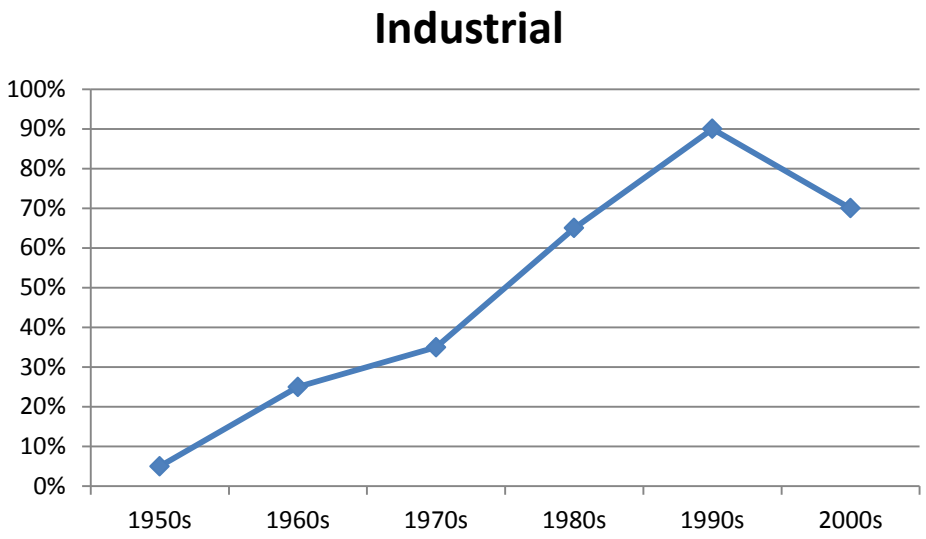


Subjects weak in early decades









Further study

- Where is this Open Access bibliographic data coming from?

- Some notes were made in the original study, but most searches were re-run and the URLs of the Google Scholar results were recorded by decade in each subject area

Aeronautical Engineering

- 1950s= publisher sites, NASA tech report server, strormingmedia site, STINET
- 1960s= publisher sites, CSA, NASA tech report server, NASA ADS
- 1970s= publisher sites, CSA, ci.nii.ac.jp
- 1980s= publisher sites, CSA, ci.nii.ac.jp
- 1990s= publisher sites, CSA, NASA Langley server
- 2000s= publisher sites, CSA, e-data-center.com

Civil Engineering

- 1950s= STINET
- 1960s= publisher sites, STINET, ci.nii.ac.jp
- 1970s= publisher sites, OSTI, STINET, scholr.ilib.cn
- 1980s= publisher sites, STINET, scholar.ilib.cn, cat.inist.fr
- 1990s= publisher sites, CSA, university site, OSTI, NRC Canada site
- 2000s= publisher sites, link.aip.org, CSA, NRC Canada, cat.inist.fr

Computer Engineering

- 1950s= publisher sites, ACM, IEEE, link.aip.org
- 1960s= ACM, IEEE, CSA, domino.watson.ibm.com
- 1970s= publisher sites, ACM, IEEE, CSA, link.aip.org, adsabs.harvard.edu, eric.ed.gov
- 1980s= publisher sites, ACM, IEEE, OSTI, cat.inist.fr
- 1990s= publisher sites, IEEE, CSA, SPIE, ieice.org
- 2000s= publisher sites, IEEE, CSA, link.aip.org, elecdesign.com

Electrical Engineering

- 1950s= IEEEXplore
- 1960s= IEEE, CSA
- 1970s= IEEE, link.aip.org
- 1980s= IEEE, NASA Astrophysics Data System (ADS)
- 1990s= IEEE, CSA
- 2000s= IEEE, publisher sites, cat.inist.fr

(OSTI, STINET, freepatentsonline, search.ieice.org)

Environmental Engineering

- 1950s= incomplete records
- 1960s= CSA, Springer
- 1970s= CSA, Springer, pubs.asce.org, awwa.org, ncbi.nlm.nih.gov
- 1980s= CSA, Springer, pubs.asce.org, OSTI, baes.bireme.br
- 1990s= CSA, Springer, IEEE, cheric.org
- 2000s= publisher sites, CSA, Springer, desline.com, nhm.nih.gov, nrel.gov, scholar.ilib.cn

Industrial Engineering

- 1950s= ci.nii.ac.jp (only 1 hit for this decade)
- 1960s= publisher sites, CSA, SAE, STINET
- 1970s= publisher sites, CSA, SAE, IEEE, PubMed
- 1980s= publisher sites, CSA, SAE, OSTI, cat.inist.fr, scientificcommons.org
- 1990s= publisher sites, CSA, SAE, STINET, IEEE, cat.inist.fr, ci.nii.ac.jp, Google patents
- 2000s= publishers, personal websites, CSA, IEEE, cat.inist.fr

Mechanical Engineering

- 1950s= deepblue.umich.edu (only 1 hit for this decade)
- 1960s= publisher sites, Google patents
- 1970s= publisher sites, CSA
- 1980s= CSA, publisher sites, NASA ADS, cat.inist.fr, ci.nii.ac.jp
- 1990s= publisher sites, cat.inist.fr, link.aip.org, CSA, Google books, NASA ADS
- 2000s= publisher sites, CSA, Google books, university

Nuclear Engineering

- 1950s= publisher sites, OSTI, IEEE
- 1960s= OSTI, adsabs.harvard.edu, link.aip.org, aps.org
- 1970s= OSTI, CSA
- 1980s= publisher sites, OSTI, CSA, IEEE, cat.inist.fr
- 1990s= publisher sites, OSTI, IEEE, cat.inist.fr, arxiv.org
- 2000s= publisher sites, OSTI, CSA, cat.inist.fr

Government Documents

- Strong in Aeronautical, Civil, Environmental, Mechanical, and Nuclear Engineering
- *Includes:*
  - NASA – ADS and technical report server
  - OSTI
  - STINET - DTIC
  - NRC Canada
  - Patents

Commercial Websites

- Strong in Aeronautical, Computer, and Mechanical Engineering
- Includes:
  - Google Books
  - Ibm.com
  - Various other .coms

International Bibliographies

- Contribute remarkably to most subjects (not Environmental)
- *Includes:*
  - cat.inist.fr = Centre National De La Recherche Scientifique
  - ci.nii.ac.jp = CINII Scholarly and Academic Information Navigator
  - ilib.cn = commercial data company
  - bireme.br = Virtual Health Library

Pre-prints

- Not very frequent
- *Includes:*
  - deepblue.umich.edu
  - arxiv.org
  - university depositories
  - personal websites

Publishers

- Strong in all subjects, but more frequent in later decades
- Includes:
  - CSA and IEEE with the most available bibliographic data in Engineering
  - professional societies
  - other publishers, most recently Elsevier itself