MAKING MathSciNet WORK HARDER FOR YOU!

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Abstract

MathSciNet is a core index of the mathematical sciences literature, indexing books, journals and conference proceedings published since 1940. An interesting feature of this index that is not well known is that assignment of standard Institution and Mathematics Subject Classification Codes combined with the powerful searching capabilities of MathSciNet make possible the compilation of detailed demographic data about mathematical publishing. These codes can be used to compare the output between specific academic departments, institutions, or even countries over a period of time. Using Institution Codes associated with each author affiliated with a particular department at an institution, one can obtain a list of publications satisfying variables of interest. If the search is done in conjunction with a specific Mathematics Subject Classification Code assigned to each item reviewed, one can further narrow the result to determine the output within a specific area of study.

Introduction

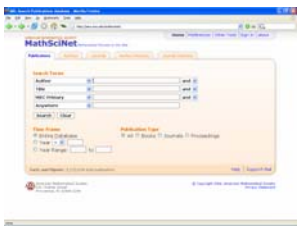
MathSciNet is a core online index of the mathematical sciences literature available by subscription via the Web at http://www.ams.org/mathscinet.

- 2,171,036 total publications indexed (as of 10/31/06)
- Over 1,800 current journals indexed
- 463,459 authors indexed
- Citation searching available

Why not use SciSearch?

- Does not index as many mathematics journals as MathSciNet (Stanford papers were published in 55 journals in SciSearch *vs.* 63 in MathSciNet in 2004)
- Does not index books or conference proceedings (44 Stanford math citations in MathSciNet in 2004)
- Difficult to search by author affiliation; generally cannot search secondary or tertiary author affiliations

Examples of journals not indexed by SciSearch:
- *Algebra and Logic*
- *Electronic Journal of Differential Equations*
- *Journal of Symplectic Geometry*
- *Selecta Mathematica*

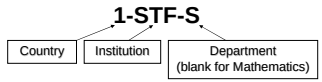


The MathSciNet general search screen

Elements of a MathSciNet Record

- Authors & Institution Codes
- Number of times paper has been cited
- Article Title
- Journal, Volume, Publication Year, Issue, Paging
- Mathematics Subject Classification Codes (primary and secondary)
- Article Review

Composition of an Institution Code



This is the Institution Code for the Department of Statistics at Stanford.

Other Institution Codes:

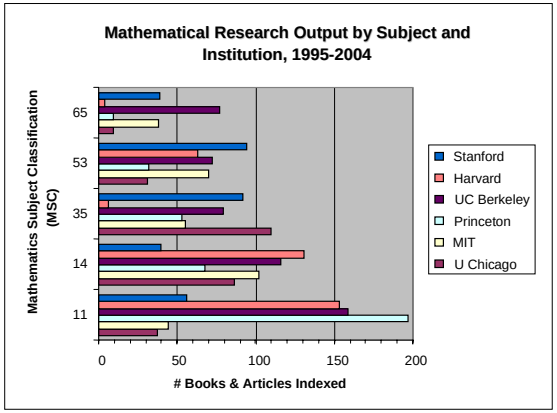
1-STF
Department of Mathematics, Stanford University

1-HRV
Department of Mathematics, Harvard University

3-TRNT
Department of Mathematics, University of Toronto

Mathematics Subject Classification (MSC)

00 General
01 History and biography
03 Mathematical logic and foundations
05 Combinatorics
06 Order, lattices, ordered algebraic structures
08 General algebraic systems
11 Number theory
12 Field theory and polynomials
13 Commutative rings and algebras
14 Algebraic geometry
15 Linear and multilinear algebra, matrix theory
16 Associative rings and algebras
17 Nonassociative rings and algebras
18 Category theory, homological algebra
19 K-theory
20 Group theory and generalizations
etc.



MSC key

11 Number theory

14 Algebraic geometry

35 Partial differential equations

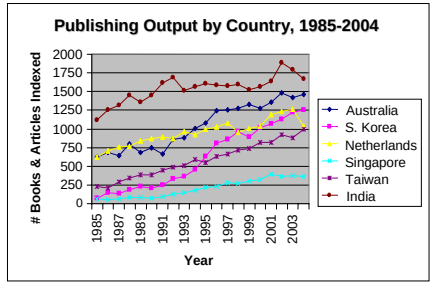
53 Differential geometry

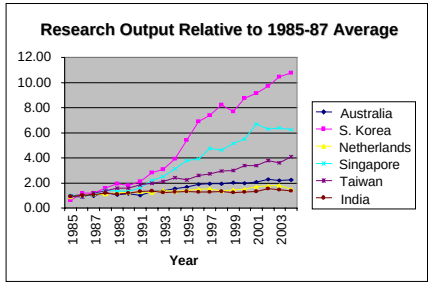
65 Numerical analysis

Searching by MSC and Institution Code and limiting to a range of years, you can determine the publishing output of a specific department during those years. Graphing the results for comparable institutions, you can visually compare the relative strengths of particular subfields at each institution. Stanford is particularly strong in the areas of differential geometry and partial differential equations.

Combined with the Mathematical Citation Quotient (the ratio of number of citations to a journal in a given year to the number of items published in that journal), you can roughly assess the quality of the journals where the research is being published.

By looking at the full record, you can also see how often a paper is cited and tally how many entries are cited above a chosen threshold to determine output quality.





You can also compare the research output between countries over a specified period of time. These graphs show the output of Australia compared to the Asian Tigers and other countries that produce comparable numbers of papers in the mathematical sciences. The graph on the right shows the striking increase in published research from the Asian Tigers over the last 10 years, indicating an increased emphasis on (and possibly funding for) mathematical research in these countries.

What can you do with this information?

Use as an evaluation tool:

- Administrators and department chairs can compare the research output of departments with other universities in combination with other factors (such as department size). Funding can be allocated to areas that are showing the greatest potential or that need more support.
- Librarians can use the information to determine if their funds are going to journals in subfields of research concentration and support arguments for maintaining current or additional funding.

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