Mathematics ≠ Science

A study in citation rates over time

Samuel Hansen

University of Michigan

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  - Mathematics provides the foundation for Science
  - Gauss: "Mathematics is the queen of the sciences"
- But are they really that similar?

A Foreign Queen

- Mathematical Vs. Scientific Knowledge

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  - Proof - Experiment

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  - Axiomatic - Theoretic

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- Funding Structures

Dataset

- Clarivate Web of Science 1900-2017
  - Big Ten Academic Alliance

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- Web of Science Categories

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  - Mathematics, Applied
  - Mathematics, Interdisciplinary Applications
  - Physics*
  - Computer Science*

Methodology

- References & Citations

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  - References are the publications listed in a the original publication's bibliography (Past)
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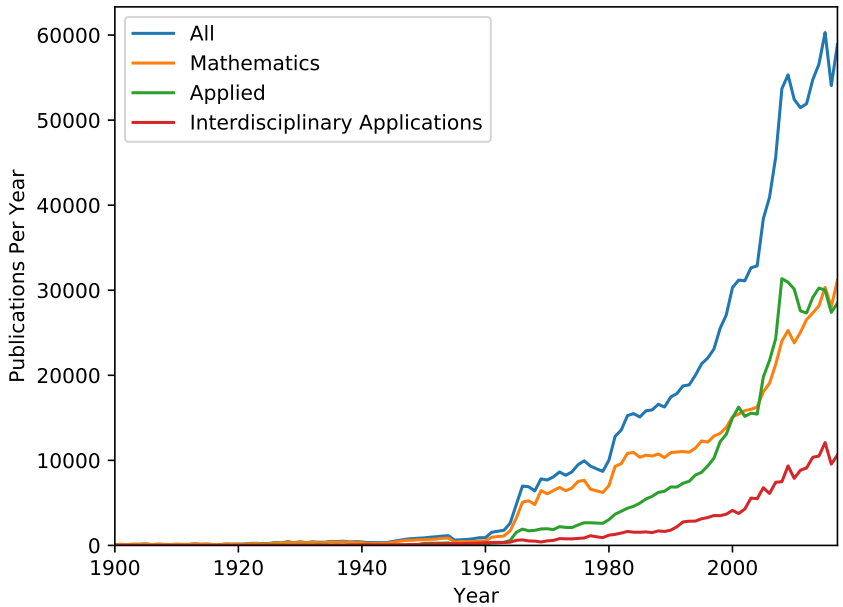
  - Incomplete Data
  - Reference date errors

Total Mathematical Publications



Mathematics	Applied	Interdisciplinary Applications	Total
742541	611160	199652	1343970

Table: Mathematical Publications in Web of Science

Reference Age

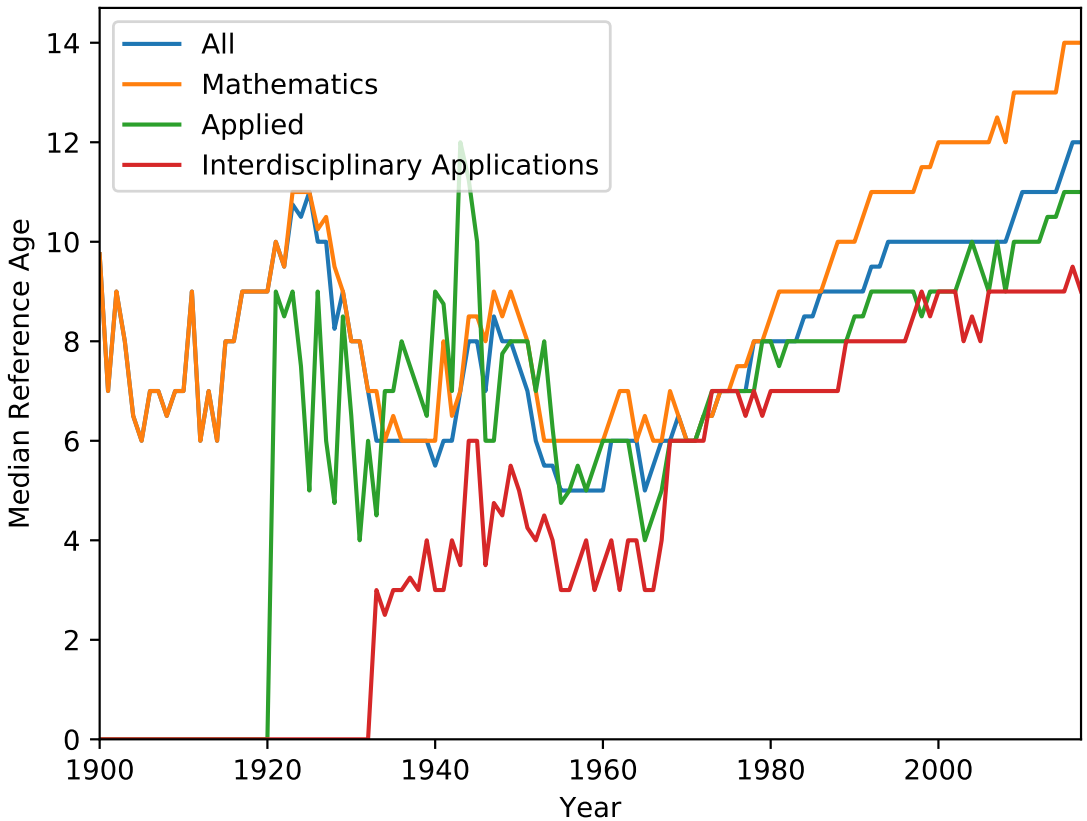
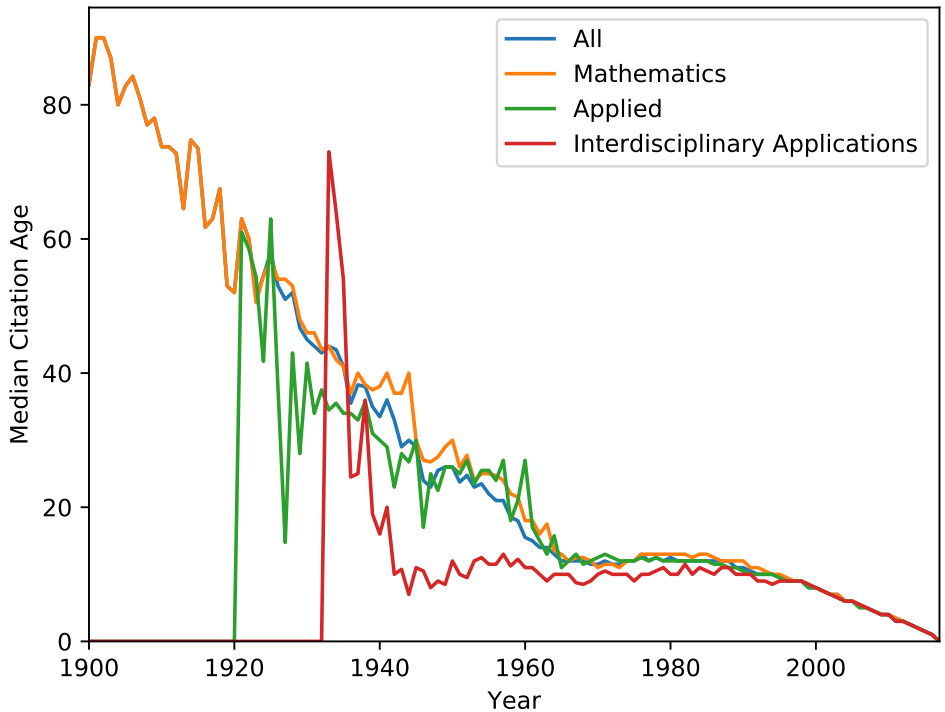


Figure: Median Reference Age for Mathematical Publications

Citation Age



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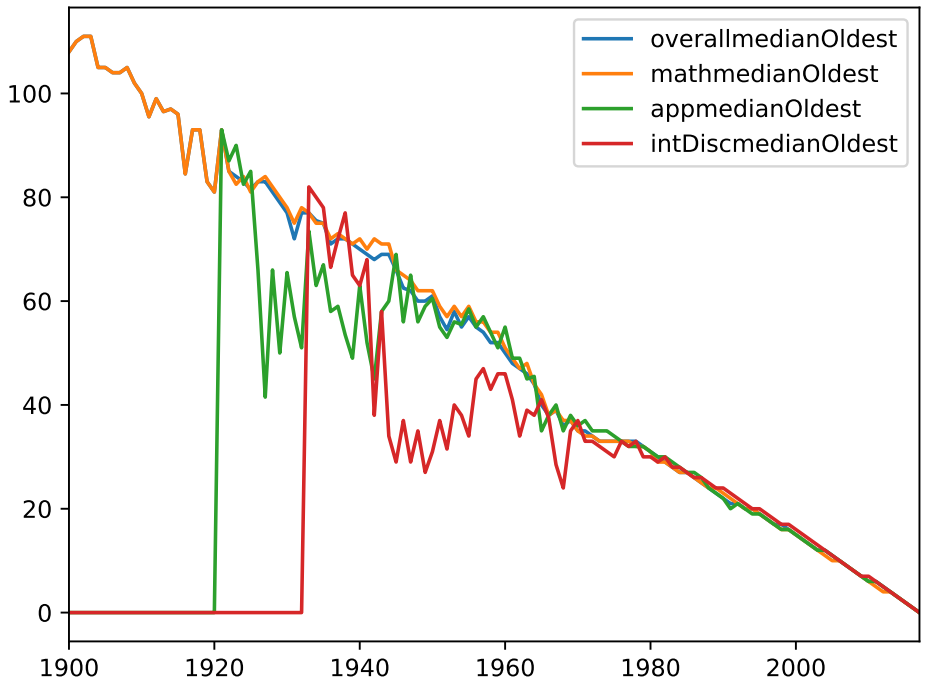

Figure: Median Oldest Citation Per Mathematical Publications

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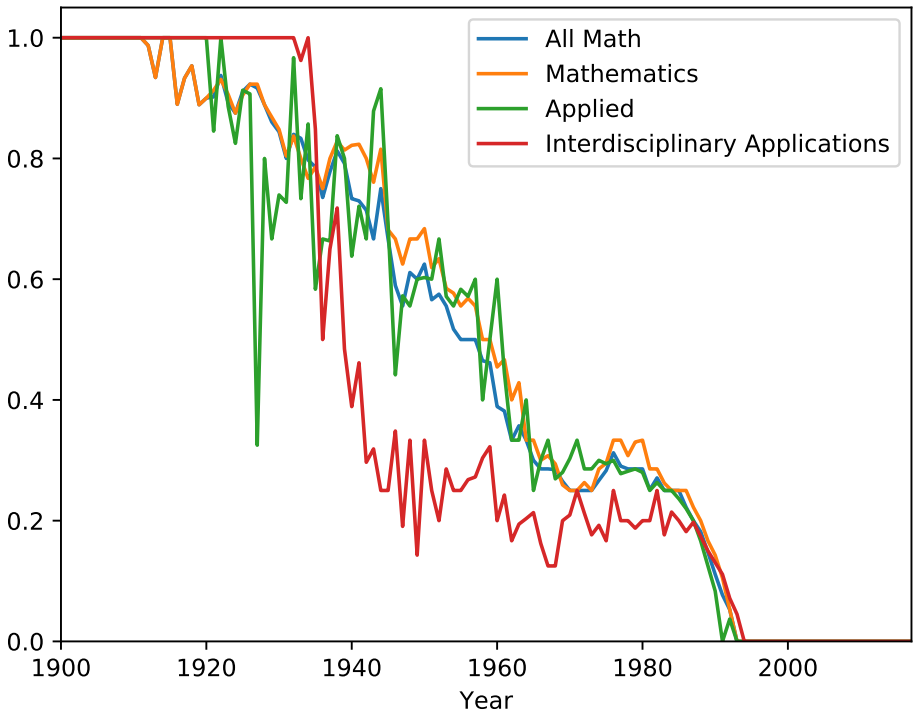
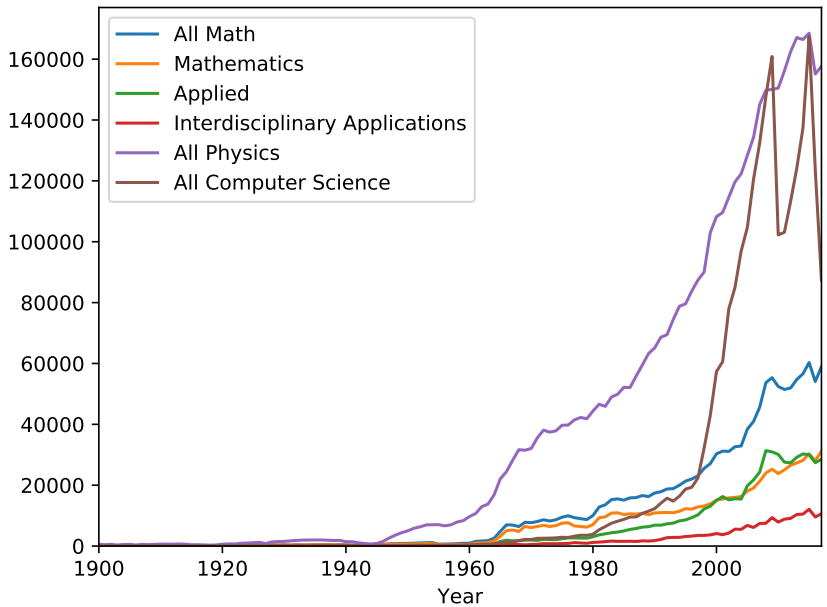


Figure: % of Citations over 20 Years Old

Total Publications



Mathematics	Applied	Interdisciplinary Applications	Mathematics Total	Physics	Computer Science
74,2541	611,160	199,652	1,343,970	4,597,628	2,332,244

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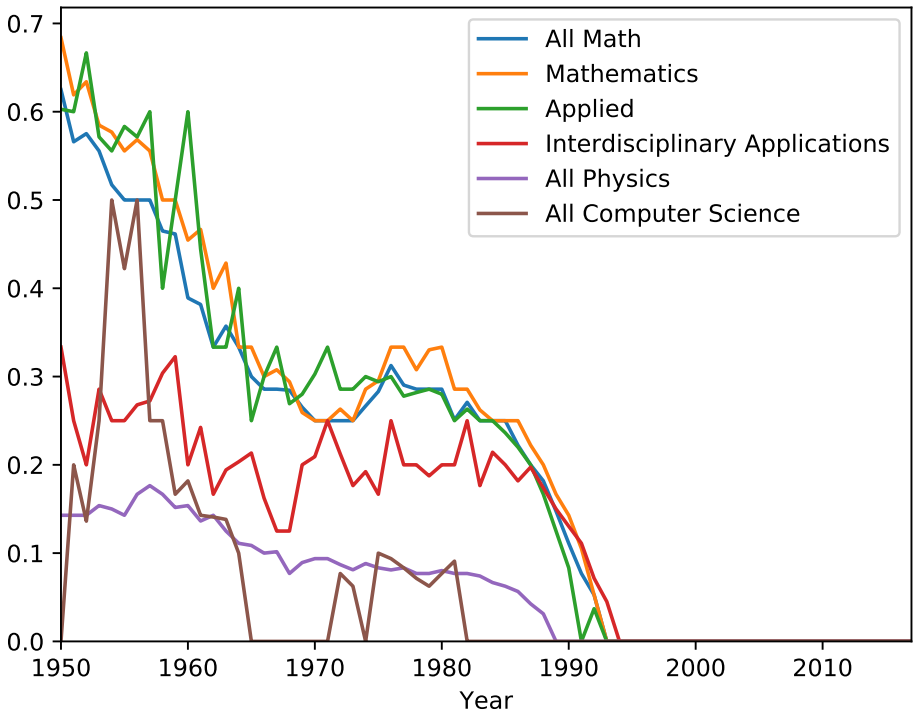

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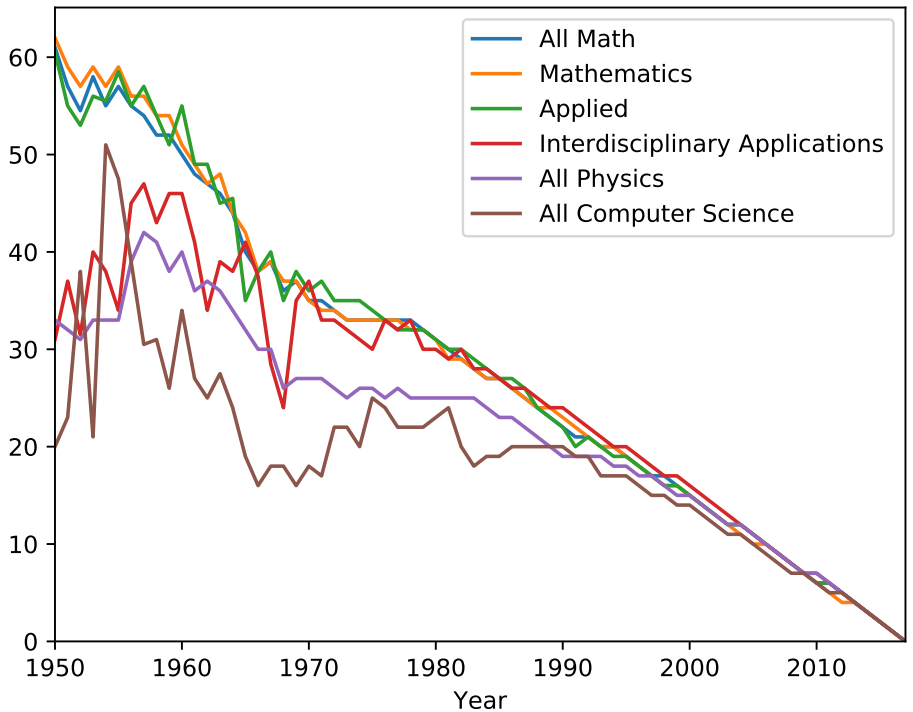

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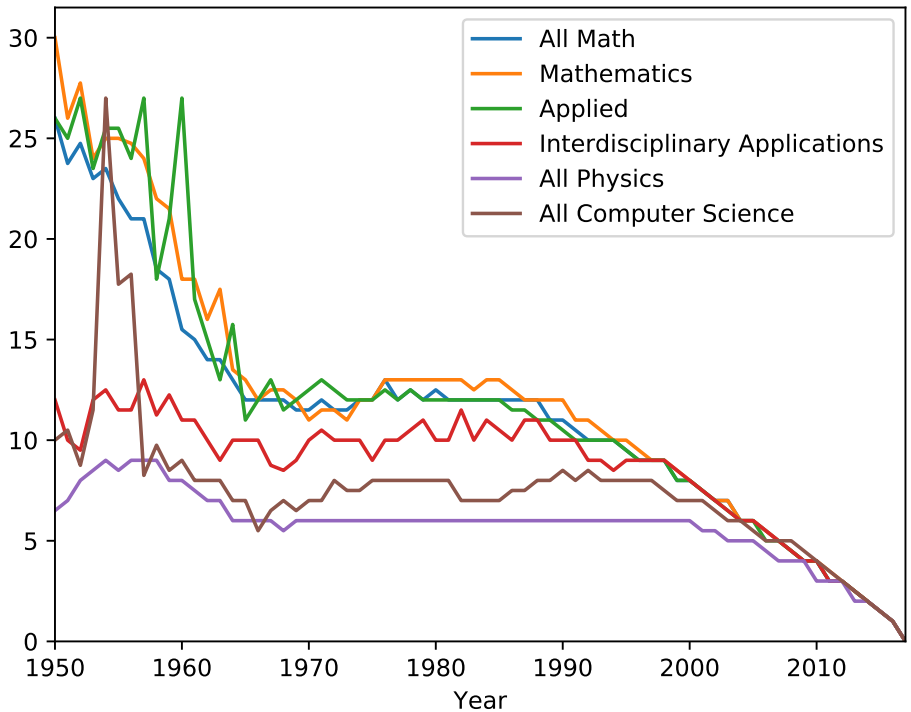

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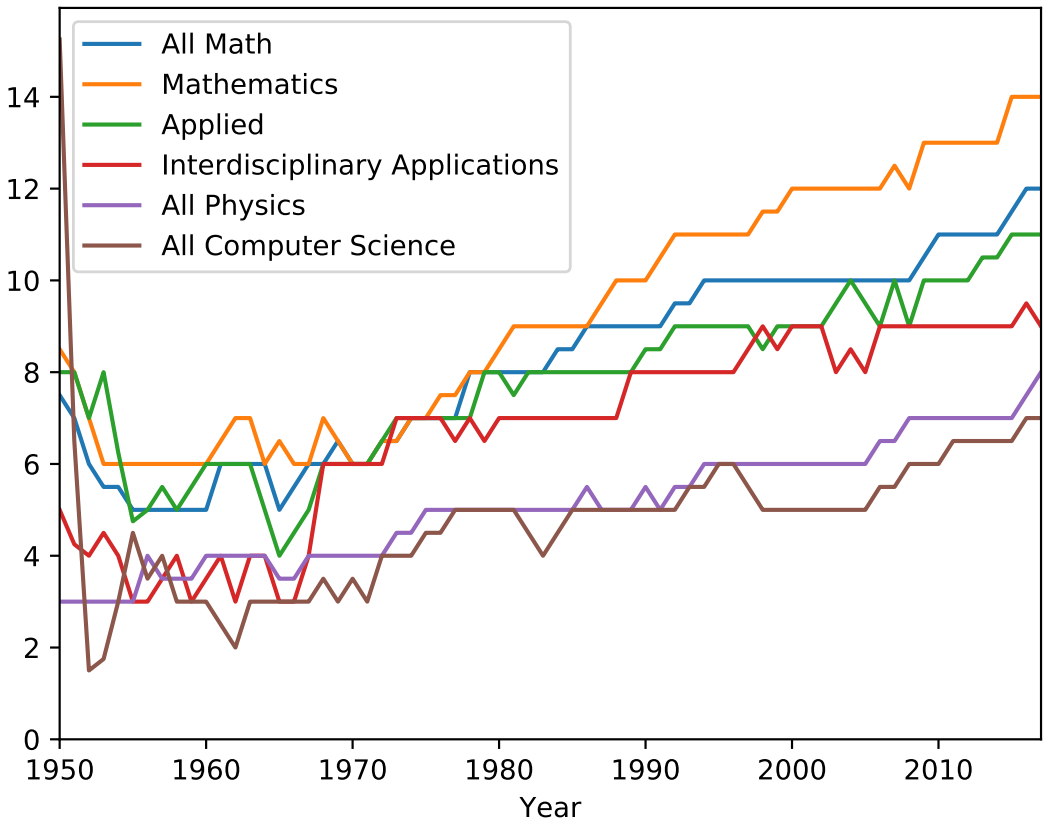

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  - 50 Years?
  - 100 Years?
- And/Or we need to use different metrics

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  - Stay on top of old material which has become relevant

Questions

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