SciTo trends: visualising scientific topic trends

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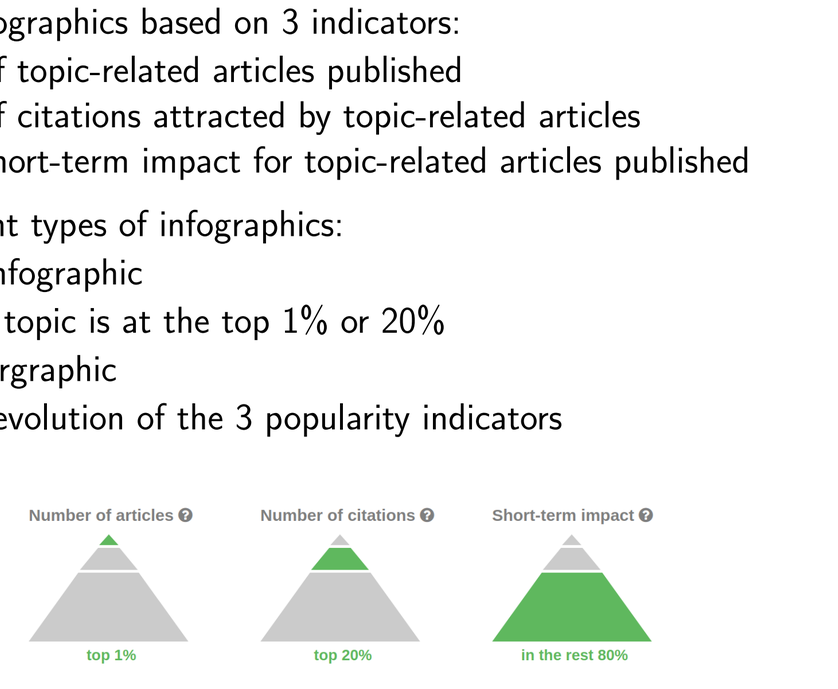
Data collection and processing

- **Article citation data**
  - OpenCitations COCI dataset[1]
  - $\sim$ **450***M* citations for $>$ **45***M* articles
- **Article impact scores**
  - Citation counts (overall impact)
  - RAM [1] scores (short-term impact)
  - Both impact scores are gathered by BIP! Finder [2]
- **Article abstracts**
  - $\sim$ **12***M* abstracts were collected from Open Academic Graph[2] [3, 4] and Crossref API[3]
  - An **LDA** [5] model was trained using the gensim[4] library

[1] https://opencitations.net/download
[2] https://www.openacademic.ai/oag/
[3] https://www.crossref.org/services/metadata-delivery/rest-api/
[4] https://radimrehurek.com/gensim/

Scito's search interface

- Keyword-based search interface based on Apache Solr[1] that facilitates scientific topics exploration



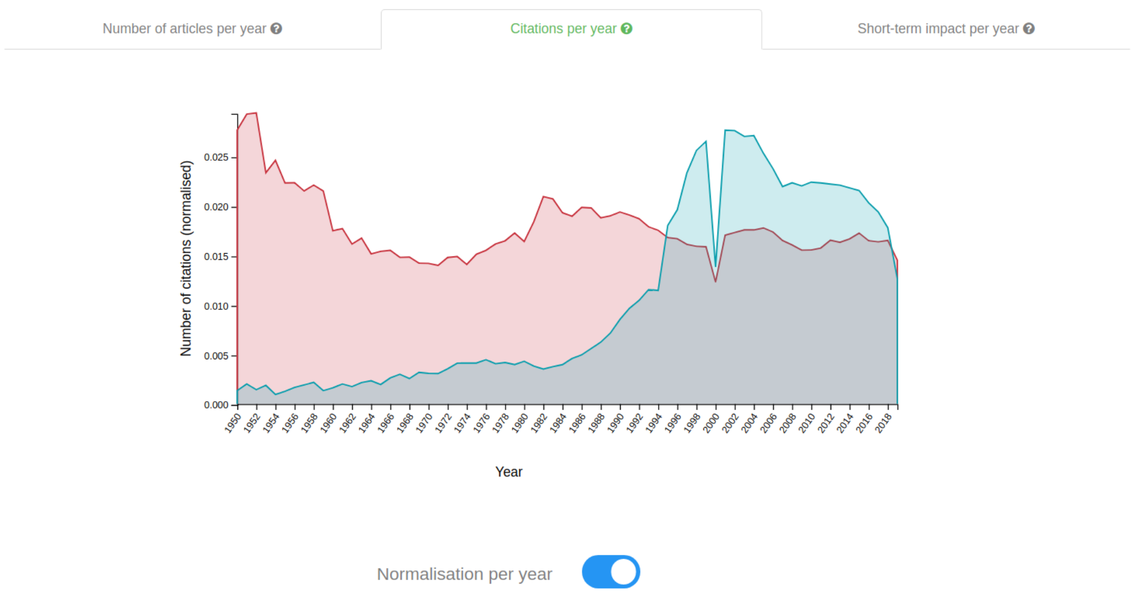
[1] https://lucene.apache.org/solr/

Visualisations for topic details

- Popularity trends for a specific topic
- Intuitive infographics based on 3 indicators:
  - Number of topic-related articles published
  - Number of citations attracted by topic-related articles
  - Average short-term impact for topic-related articles published
- Two different types of infographics:
  - Pyramid infographic
    - Shows if topic is at the top 1% or 20%
  - Trend inforgraphic
    - Dispays evolution of the 3 popularity indicators

Visualisations for topic comparison

- 2 or more topics can be selected for comparison
- The comparison view contains the Trend infographic for all topics under comparison
- Comparison scenario:
  - A researcher explores topics related to the keyword "gene". She finds a rather popular topic containing the terms "mrna", "rna" and "transcript". (blue time-series)
  - Then, she wants to compare this topic with the research field studying drug effects. She identifies a topic from life sciences containing the terms "drug", "treatment" and "effect" (red time-series).
  - In the comparison view, the Trend infographic reveals that although the "drug"-related topic was traditionally more popular, after **1995** the "gene"-related topic started to become equal or more popular (depending on the indicator used)



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