SDG dataset categorised into 16 Topics - based on the coherence analysis.

Visualising University Research and SDG Contribution in South Africa

INTRODUCTION

- Aim:
  - Visualising the dataset in the SDG Hub database as best as possible, using topic analysis => enables users to scan through few topics, rather than tons of documents
  - Improve dataset navigation through interactive tools
  - Overview of the research landscape
- Dataset
  - Obtained from the SA SDG Hub – abstracts were in a separate dataset.
  - 159,846 observations
  - 36 variables
  - Size = 118MB

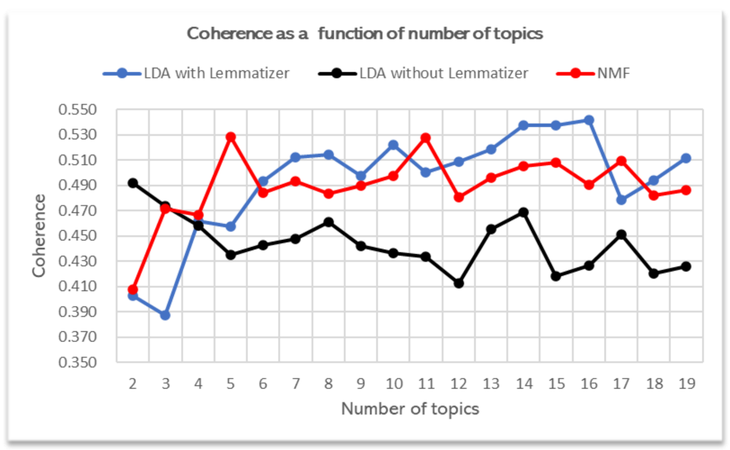
METHODS

Assess different unsupervised models for topic analysis

1. Source and join datasets
2. Explanatory Data Analysis
3. Preprocessing
4. Modeling
   - Latent Dirichlet Allocation or LDA (without lemmatizing) => **0.43**
   - Latent Dirichlet Allocation or LDA (with lemmatizing) => 0.54
   - Non-Negative Matrix Factorization or NMF (with lemmatizing) => 0.49
5. Final model selection: LDA with lemmatizing, based on coherence
6. Visualisation

RESULTS

- Modeling Results: Coherence plot analysis **(0.54)** – optimum number of topics under LDA with lemmatizing = 16

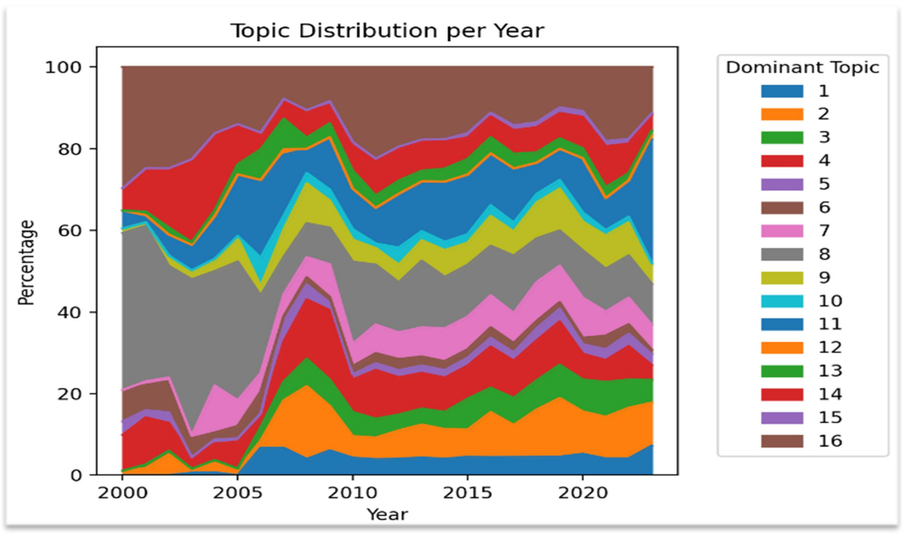


DISCUSSION

- **Intertopic Distance Map:**
  - Per topic => size of bubble rep. % of tokens in the corpus (Topic 16, 13.6% of tokens)
  - Distance between bubbles rep. how closely related their key words are
  - Bar chart: key words from selected topic(bubble). Term frequency within selected topic + overall term frequency within the corpus

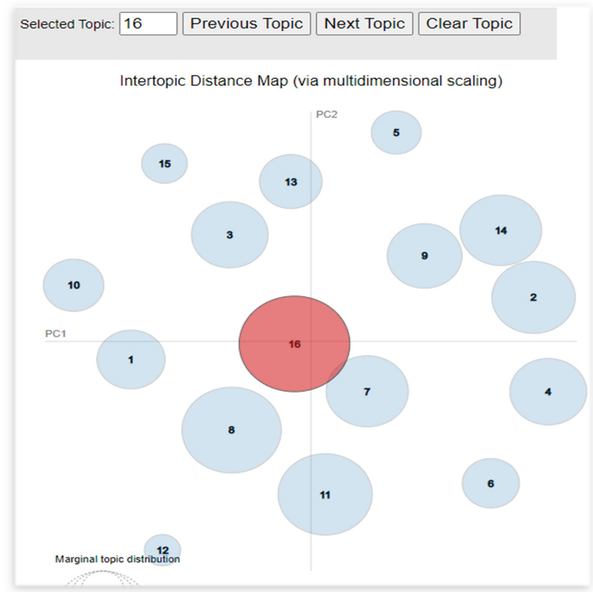
- **Wordclouds**:
  - Prominent words from selected topic (bubble) – model, method, data, etc

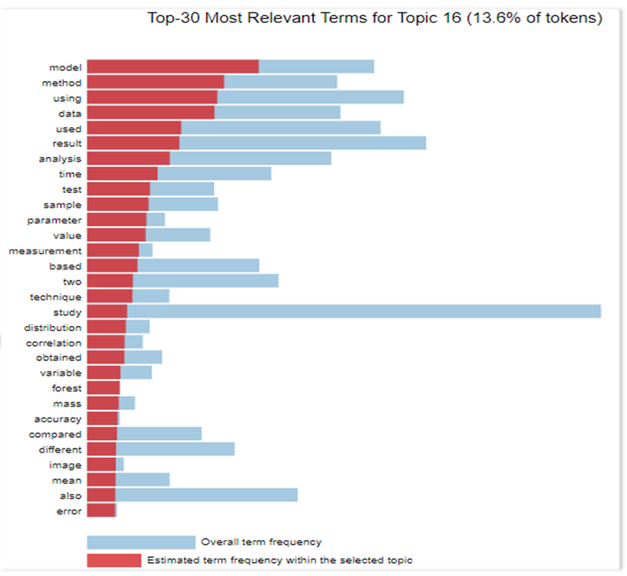
- **Other Charts**
  - **Topic Distribution Chart**– shows prevalence of different topics over time
  - SDG classifications across topics **(heat map)** – Topic 1 and SDG 3 have the highest frequency
  - Number of publications per institute **(bar graph)** – MIT, Michigan (around 40 000), Univ. of Pretoria (above 30 000)

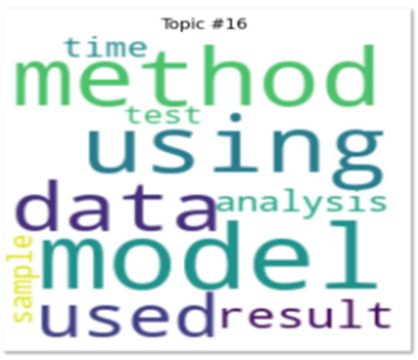


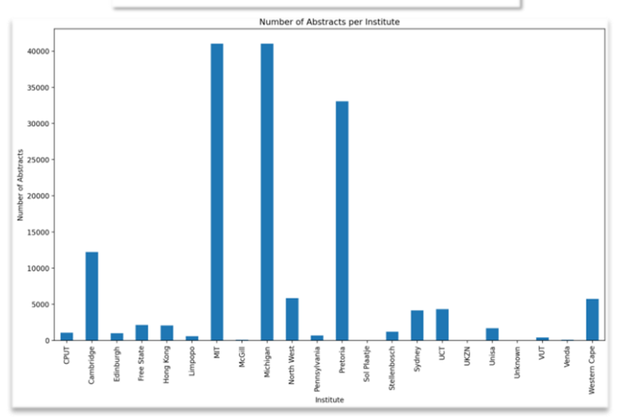
FUTURE WORK

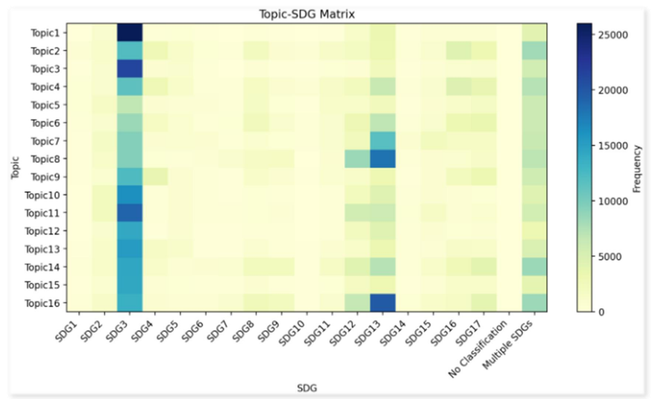
- Alternative topic analysis models e.g. Hierarchical Dirichlet Processes (HDP)
- User feedback incorporation to establish needs from the community
- Enhanced visualisation techniques e.g. network graphs











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