Top2Vec as a tool for topic identification in fiction. A study on contemporary Czech prose.

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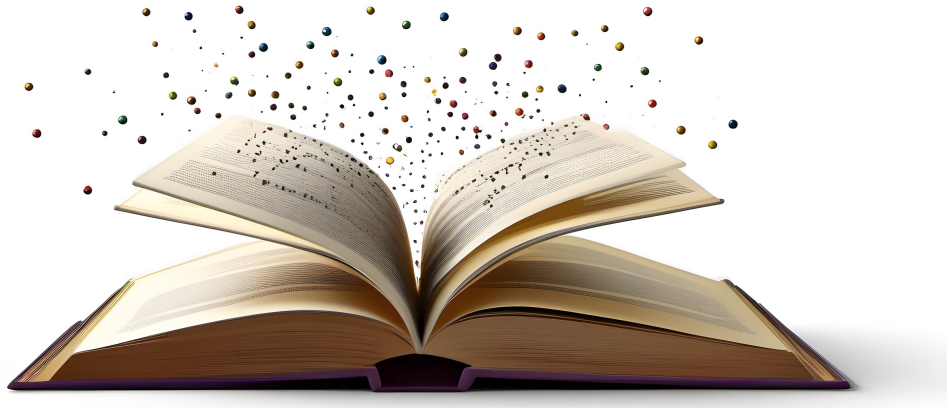
Outline

1. Introduction
2. Background
3. Research Methodology
4. Topic Modelling Techniques
5. Results and Observations
6. Conclusion
7. Q&A

Research question

- Trends in contemporary Czech literature -> topics?
- How does topic modelling relate to traditional literary studies?



Trends in Czech literature

1990s - Two streams emerged

- fantasy, imaginative prose associated with the metropolis (mostly Prague)
- authenticity, connected by the author's "self"

2000s - Works set in specific times and places

- historical traumas (holocaust, expulsion of Germans ...)
- the atmosphere of life in (post)communist society

2010s – Continuation of the trend from the previous decade

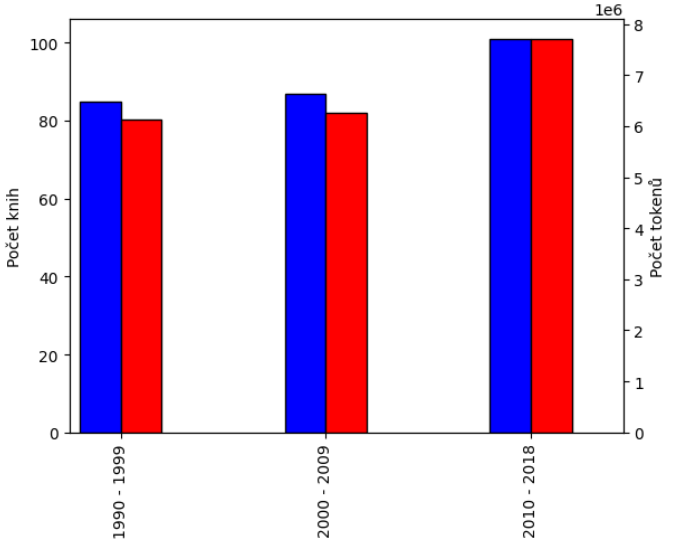
- Relationship crisis
- (Auto)biographies

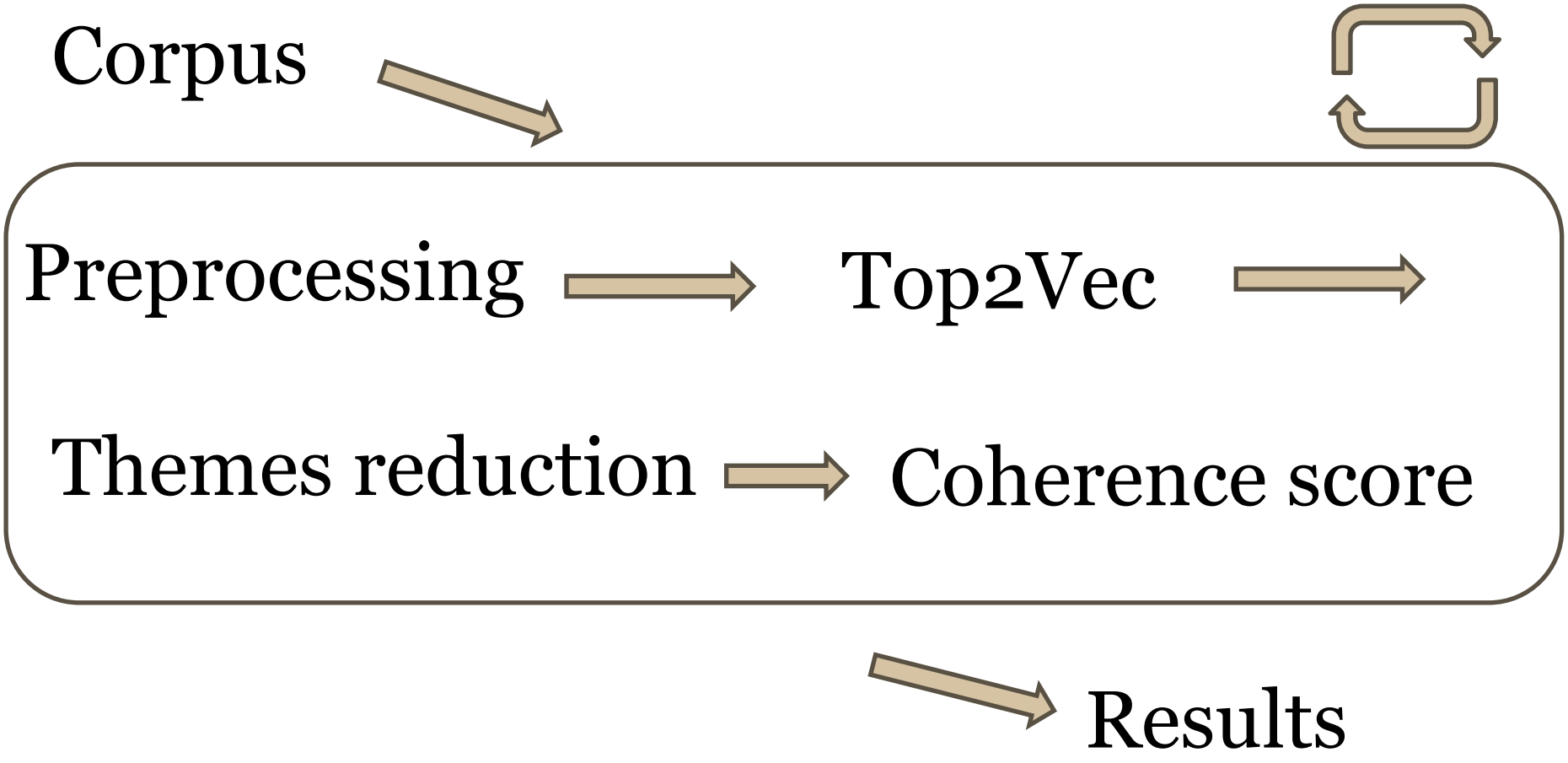
Topic Modelling in DLS

- Jockers, Matthew L., and David Mimno. ‘Significant Themes in 19th-Century Literature’, 2013.
- Schöch, Christof. ‘Topic Modeling Genre: An Exploration of French Classical and Enlightenment Drama’, 2021.
- Van Zundert, Joris J et. al. ‘What Do We Talk About When We Talk About Topic?’, 2022.

Corpus

- Publicly available corpus from the Czech National Corpus, SYN v9
- Only fiction -> prose
- Not representative, however diverse
- documents split into sections and mixed
- 273 books
- Divided into 3 decades based on the date of first publication



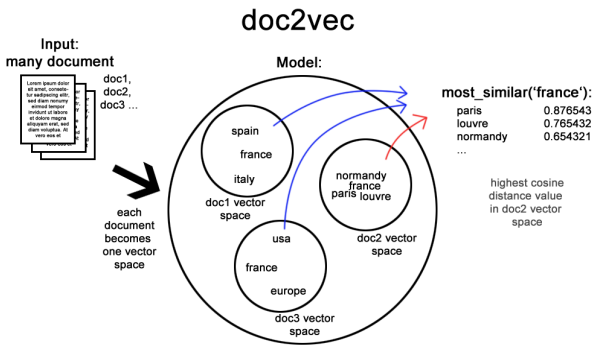

Corpus
Preprocessing
Top2Vec
Themes reduction
Coherence score
Results

Preprocessing

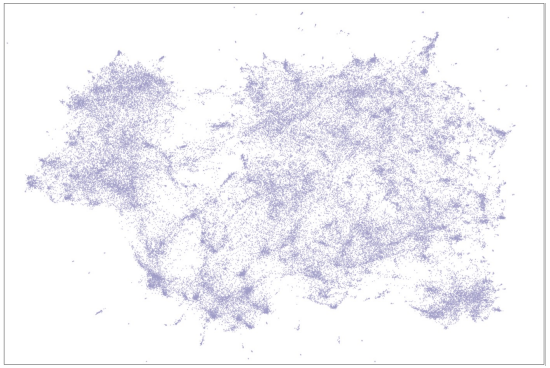
- The corpus is already lemmatized.
- Removal of Named Entity Recognition (NER) - NameTag
- Removal of stopwords.
- Splitting documents into parts.

Top2Vec

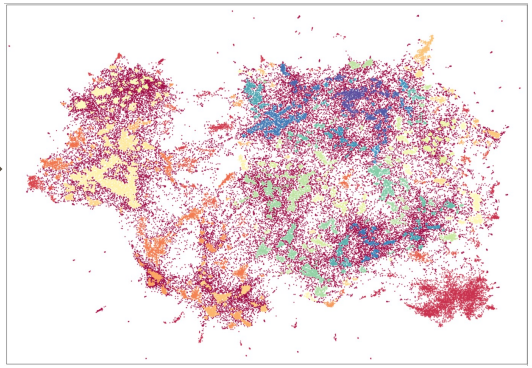
doc2vec



UMAP



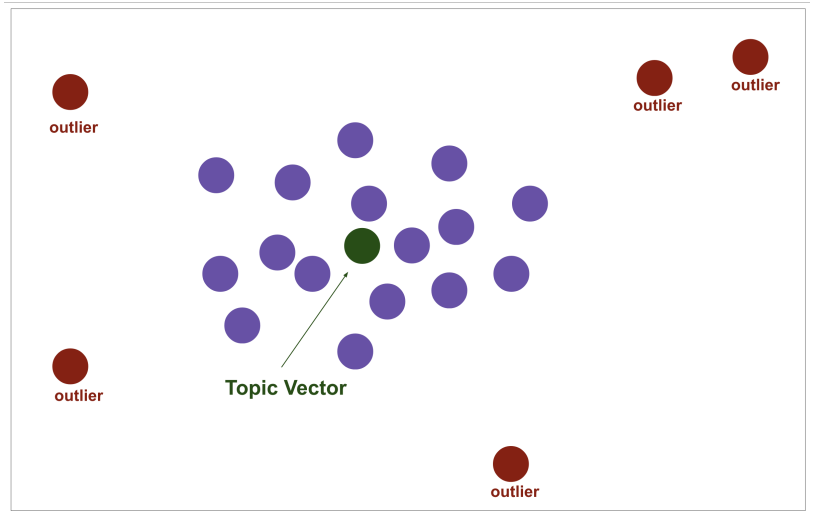
HDBSCAN

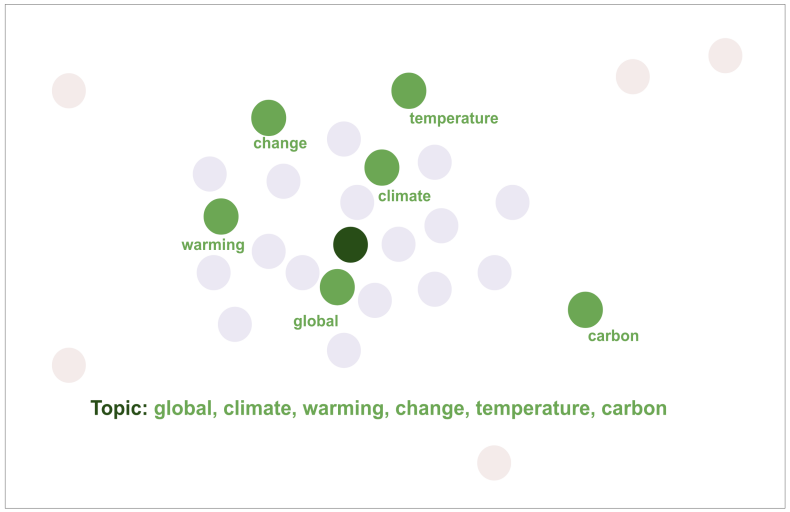


Pham, Hieu Huu Quang. (2017). An Empirical Approach to Sentiment Analysis with Doc2Vec. Retrieved from the University of Minnesota Digital Conservancy, https://hdl.handle.net/11299/190914.

Angelov, D. (2020). Top2vec: Distributed representations of topics. *arXiv preprint arXiv:2008.09470*.

Top2Vec





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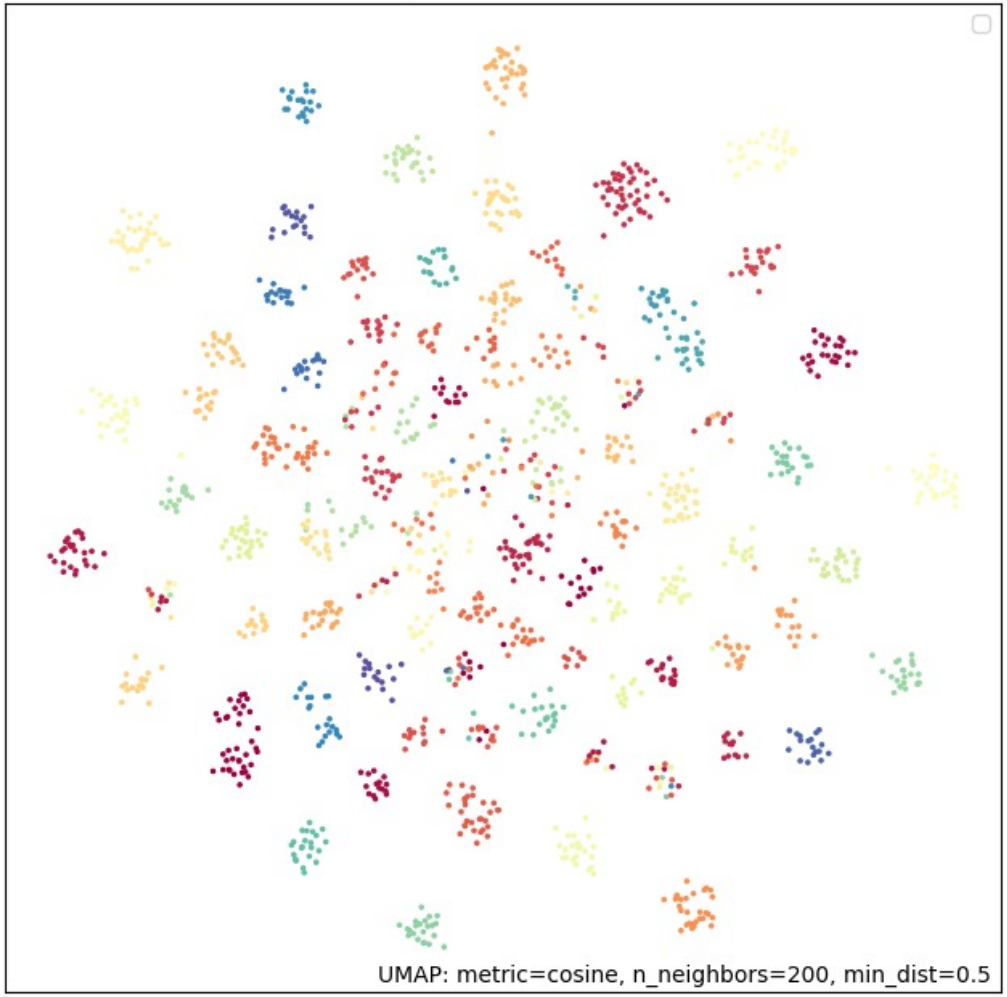
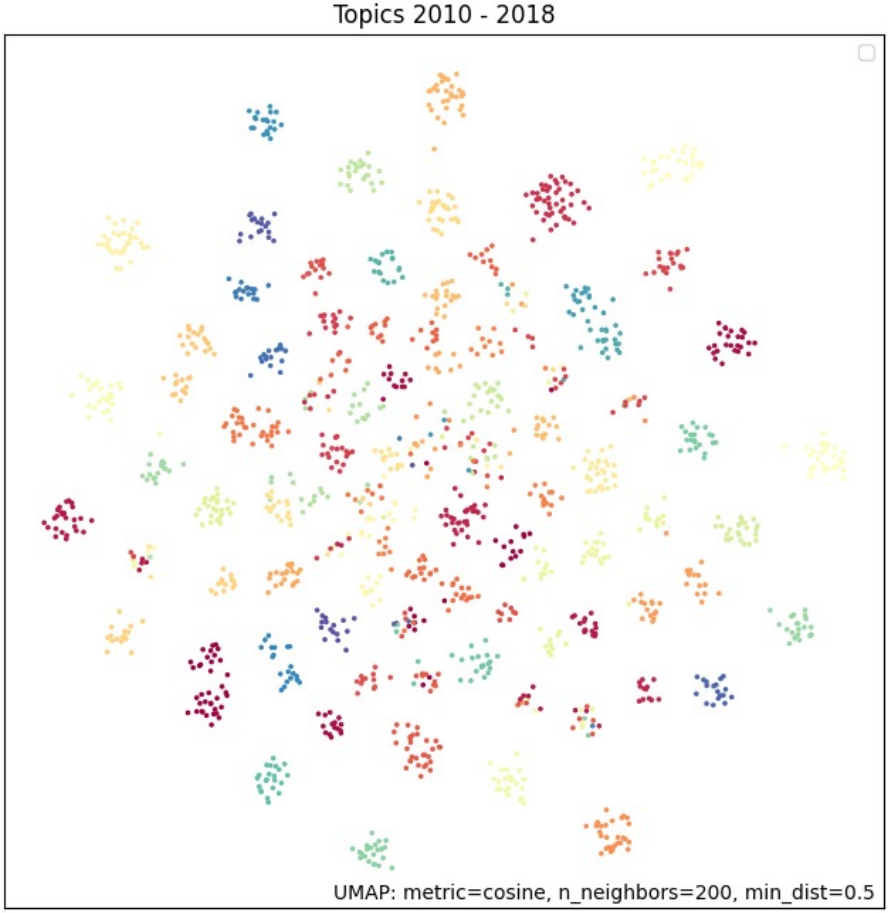
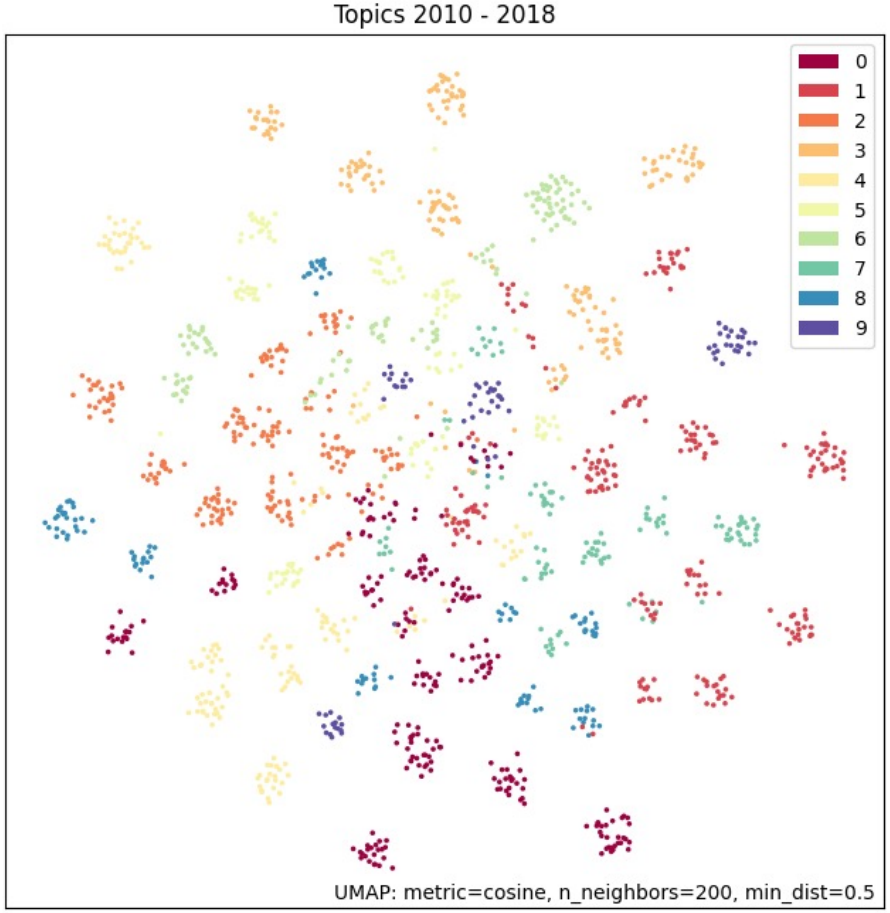
Topics 2010 - 2018



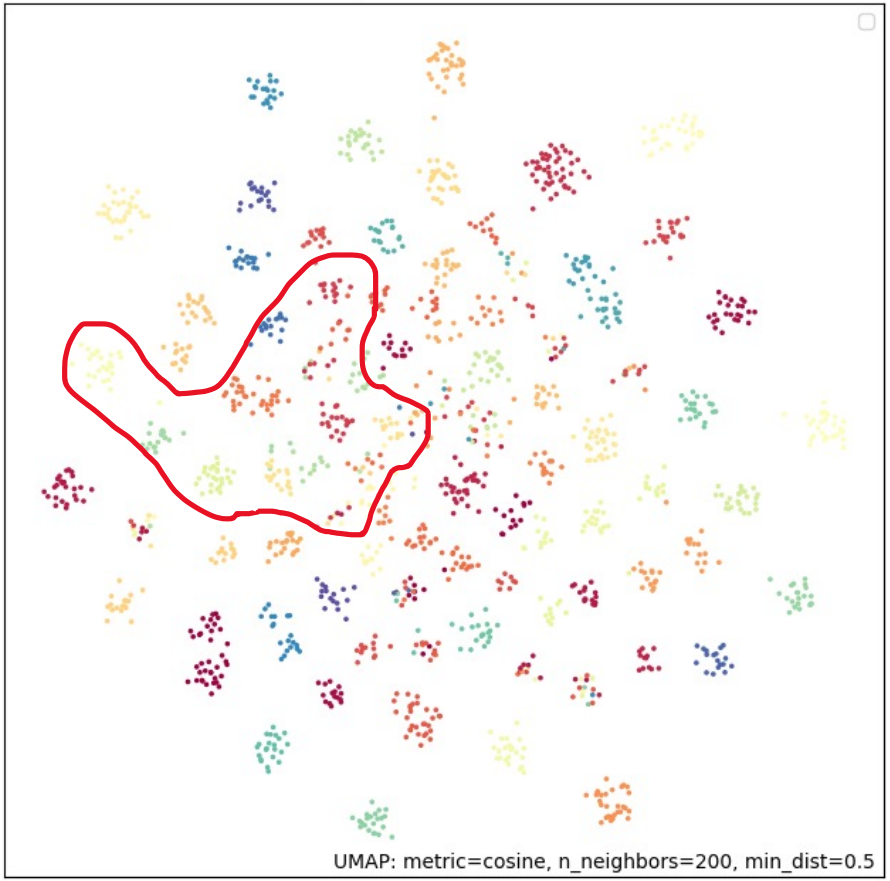
Coherence score

Tokens	Topics	C_v
1000	10	0,447
1000	20	0,465
1000	30	0,471
2000	**10**	**0,479**
2000	20	0,470
2000	30	0,468

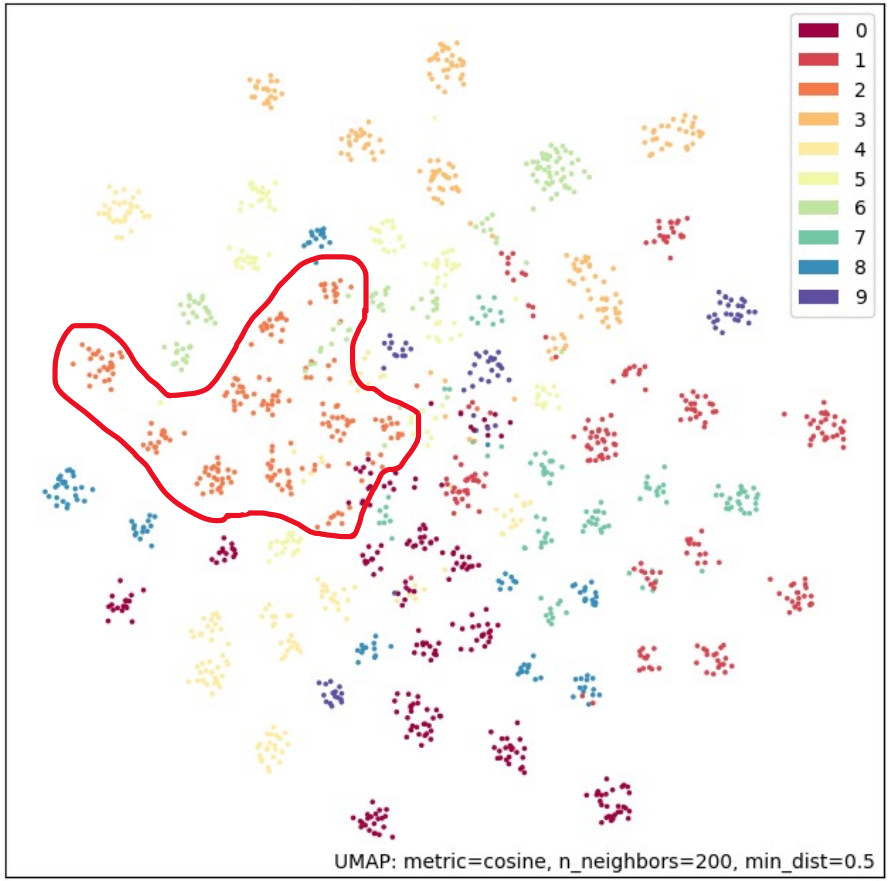

Topics 2010 - 2018
UMAP: metric=cosine, n_neighbors=200, min_dist=0.5


Topics 2010 - 2018
0
1
2
3
4
5
6
7
8
9
UMAP: metric=cosine, n_neighbors=200, min_dist=0.5

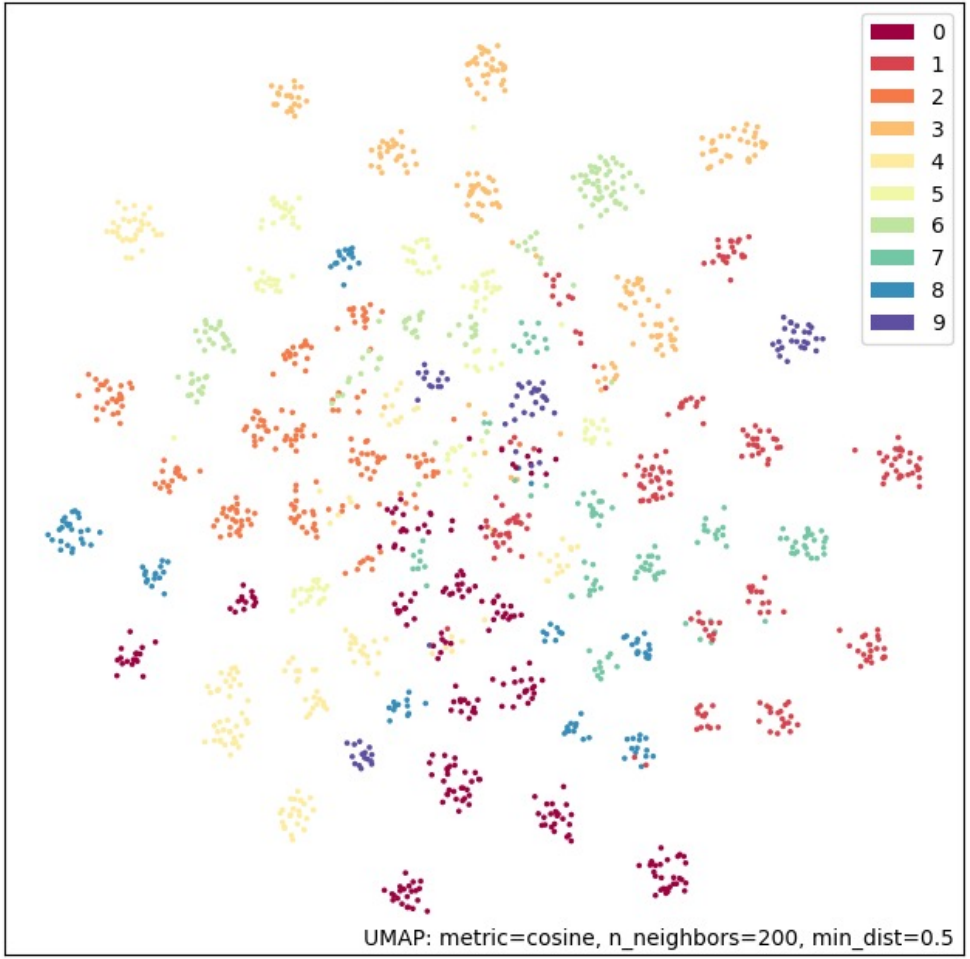
Topics 2010 - 2018



Topics 2010 - 2018

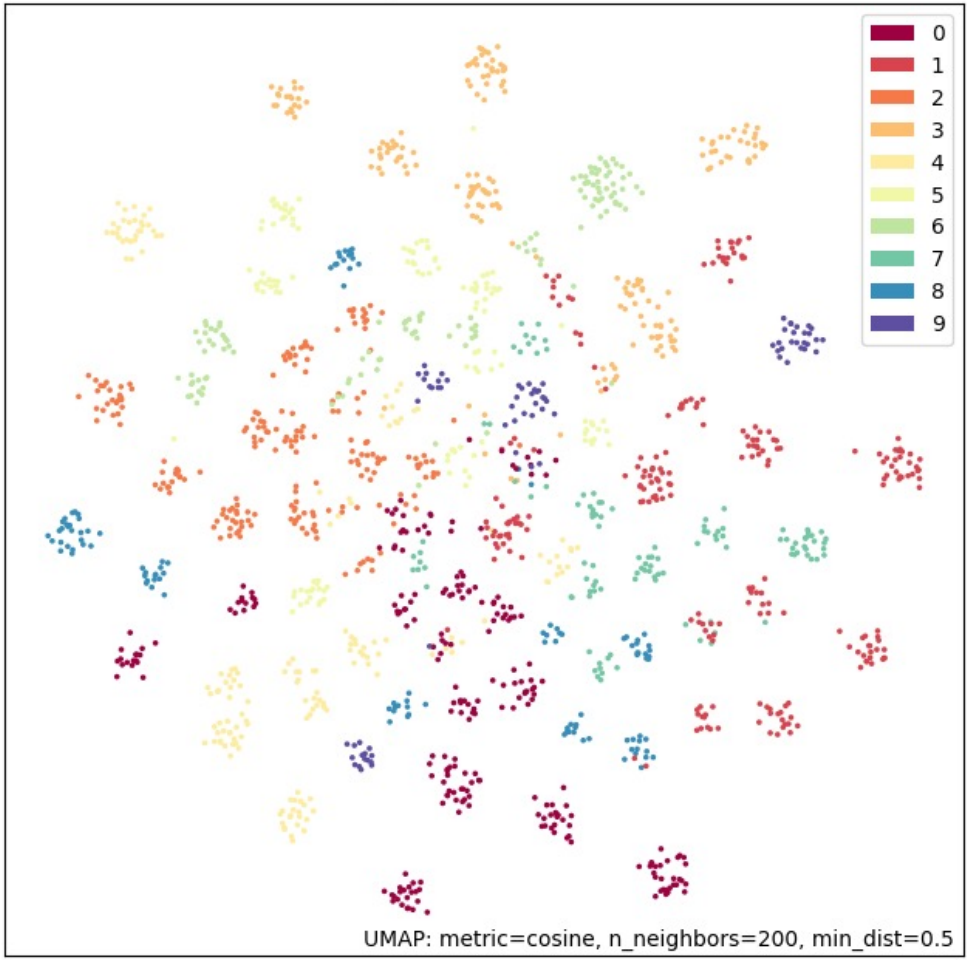


Topics 2010 - 2018



3
communist
mom, mother
communist
party-related
comrade
military service
resistance
socialist
Czechoslovakian
regime

Topics 2010 - 2018



3
komunista
maminka
komunisticky
stranicky
soudruh
vojna
odbojar
socialisticky
ceskoslovensky
rezim

3
communist
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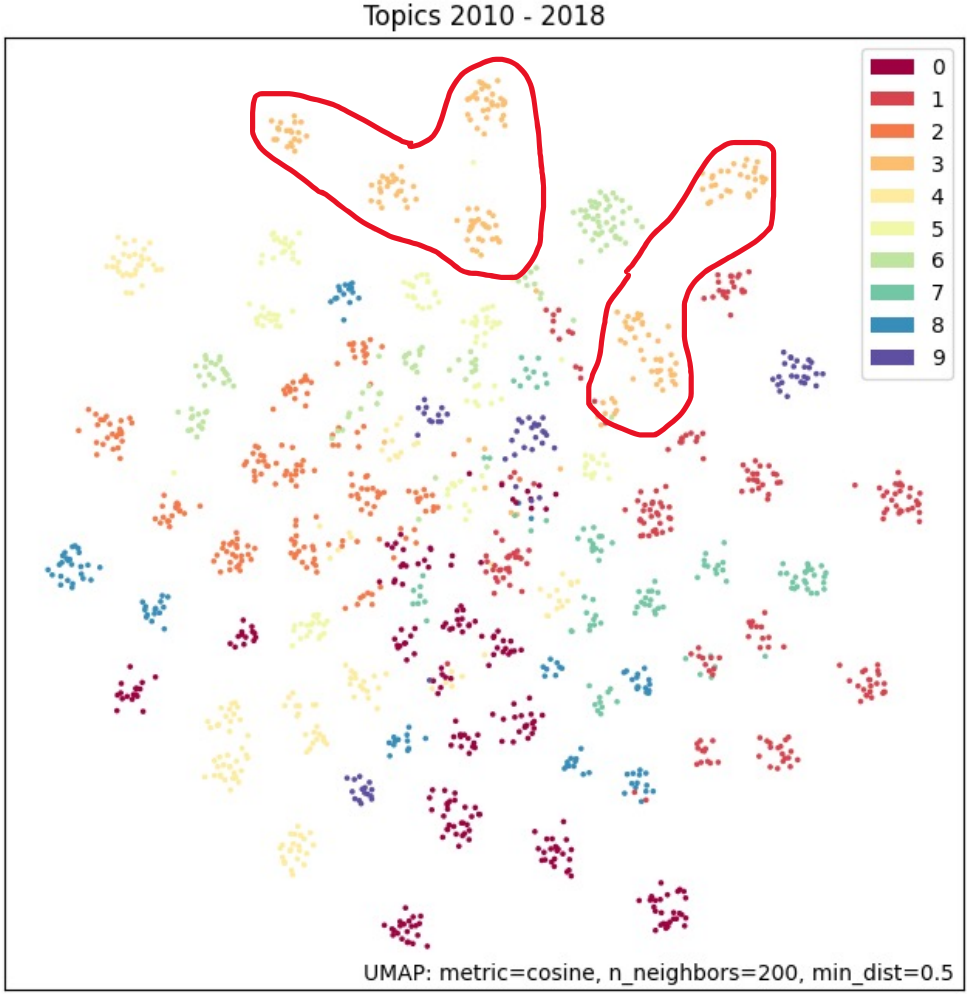
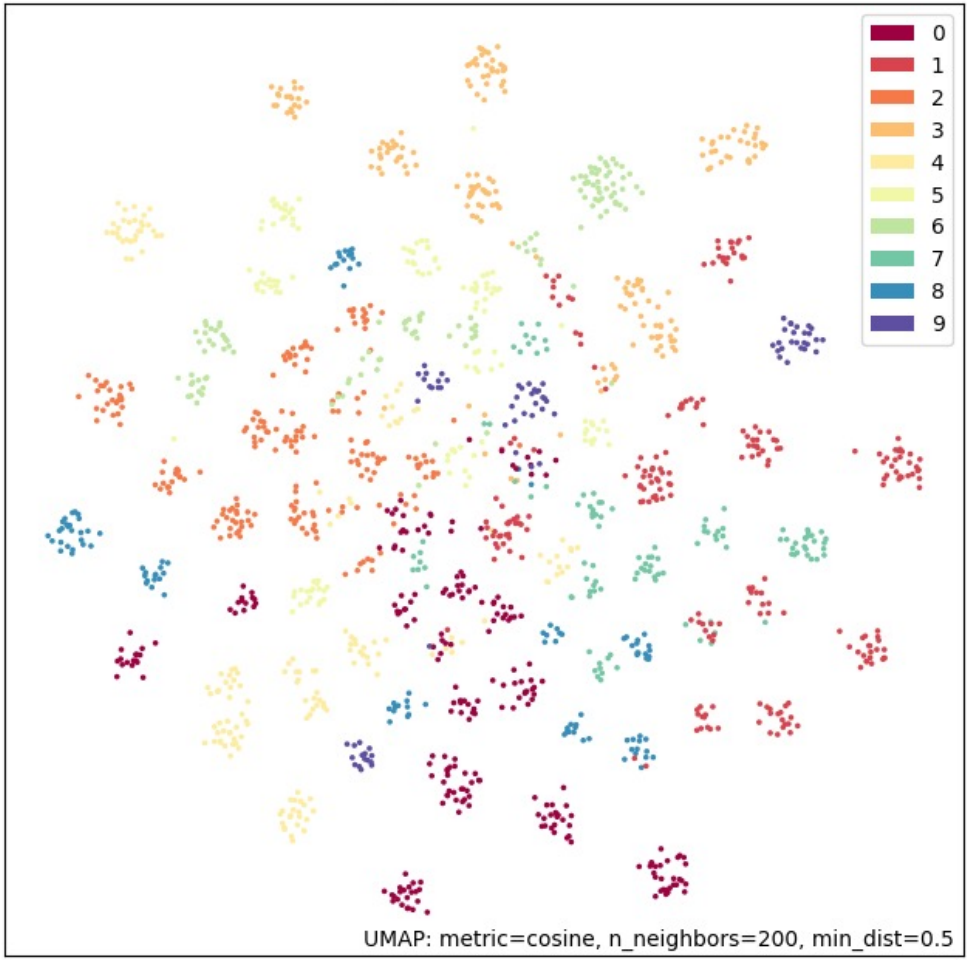


3
komunista
maminka
komunisticky
stranicky
soudruh
vojna
odbojar
socialisticky
ceskoslovensky
rezim

4
dad
uncle
village
cottage
this year
village square
holiday
bag
Lhotka
bus

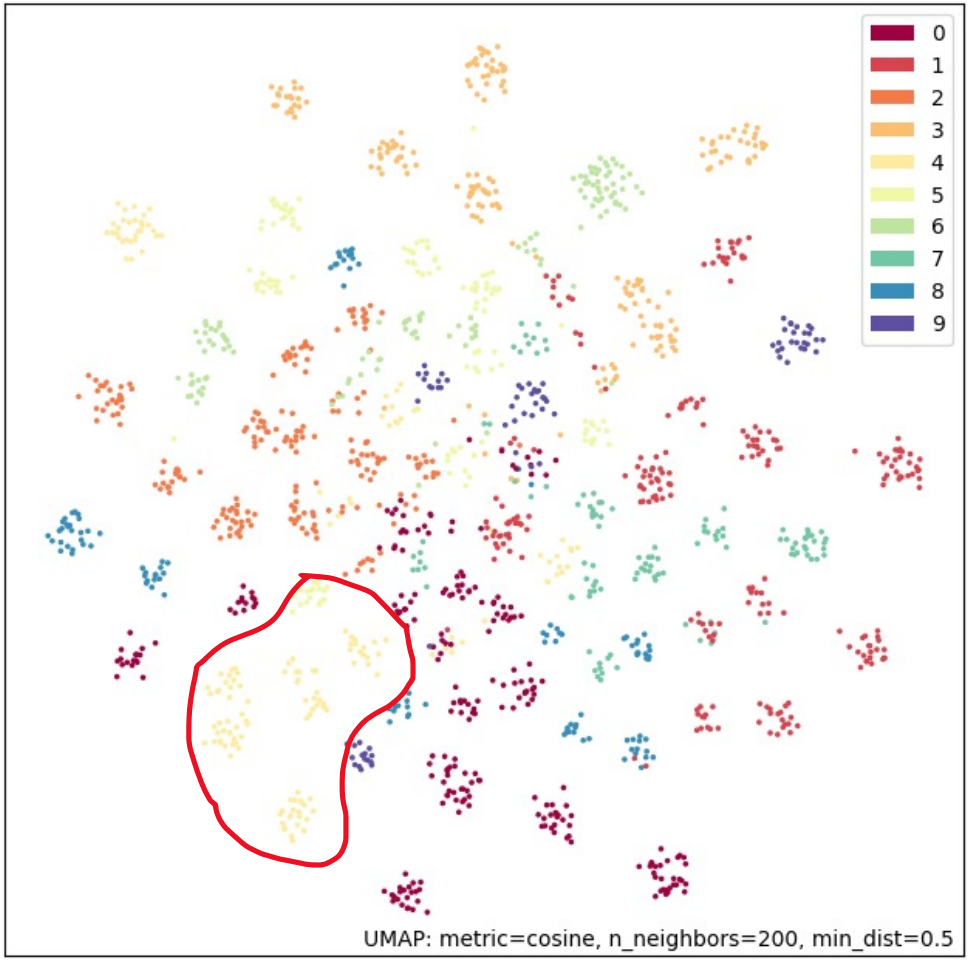
Topics 2010 - 2018



4
tata
strejda
ves
chalupa
letos
naves
prazdniny
taska
lhotka
autobus

4
dad
uncle
village
cottage
this year
village square
holiday
bag
Lhotka
bus

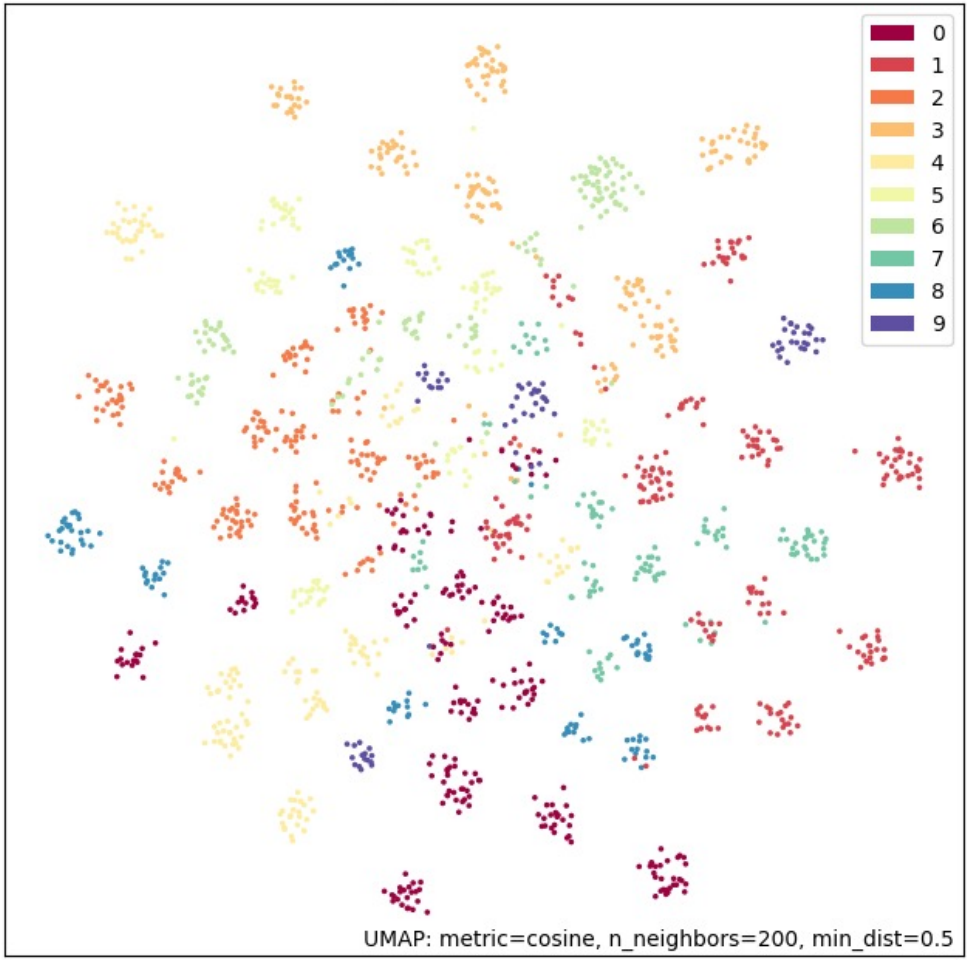
Topics 2010 - 2018



4
tata
strejda
ves
chalupa
letos
naves
prazdniny
taska
lhotka
autobus

7
heretic
duke
divine
church
archbishop
master
saint
tavern
teaching
parish priest

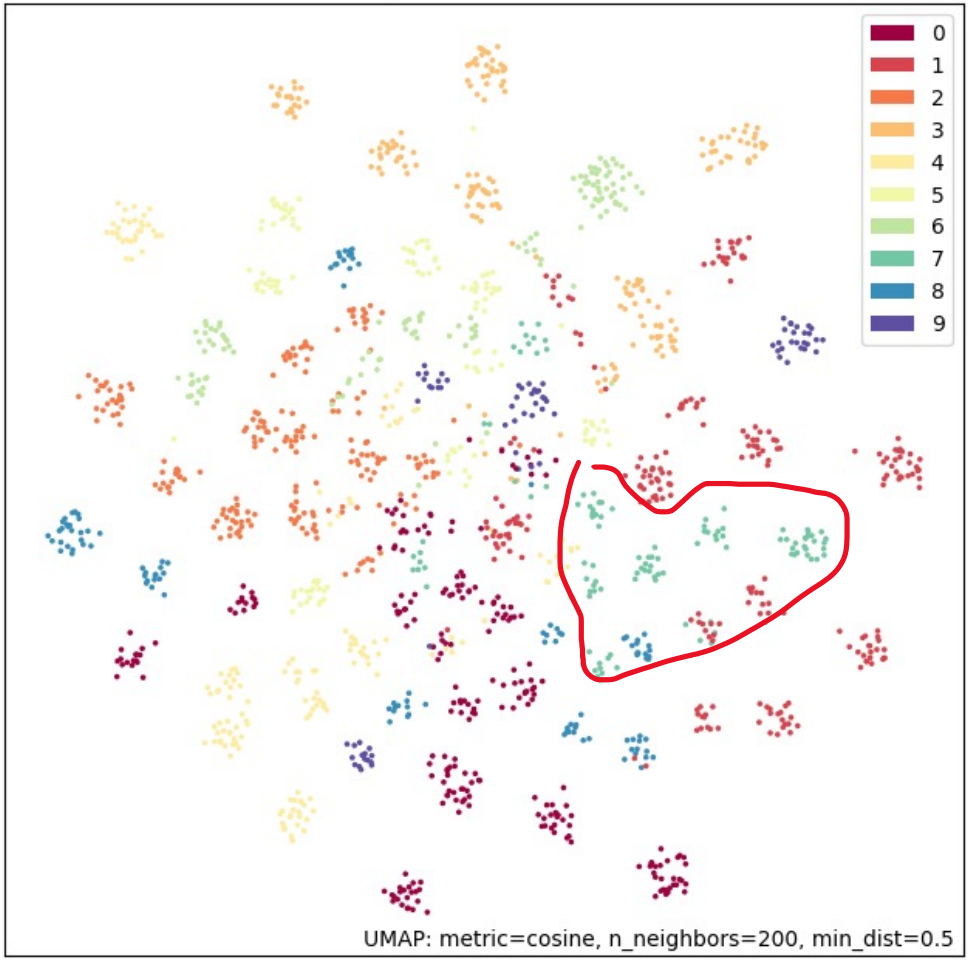
Topics 2010 - 2018



7
kacir
knez
bozi
cirkev
arcibiskup
mistr
svaty
krcma
uceni
farar

7
heretic
duke
divine
church
archbishop
master
saint
tavern
teaching
parish priest

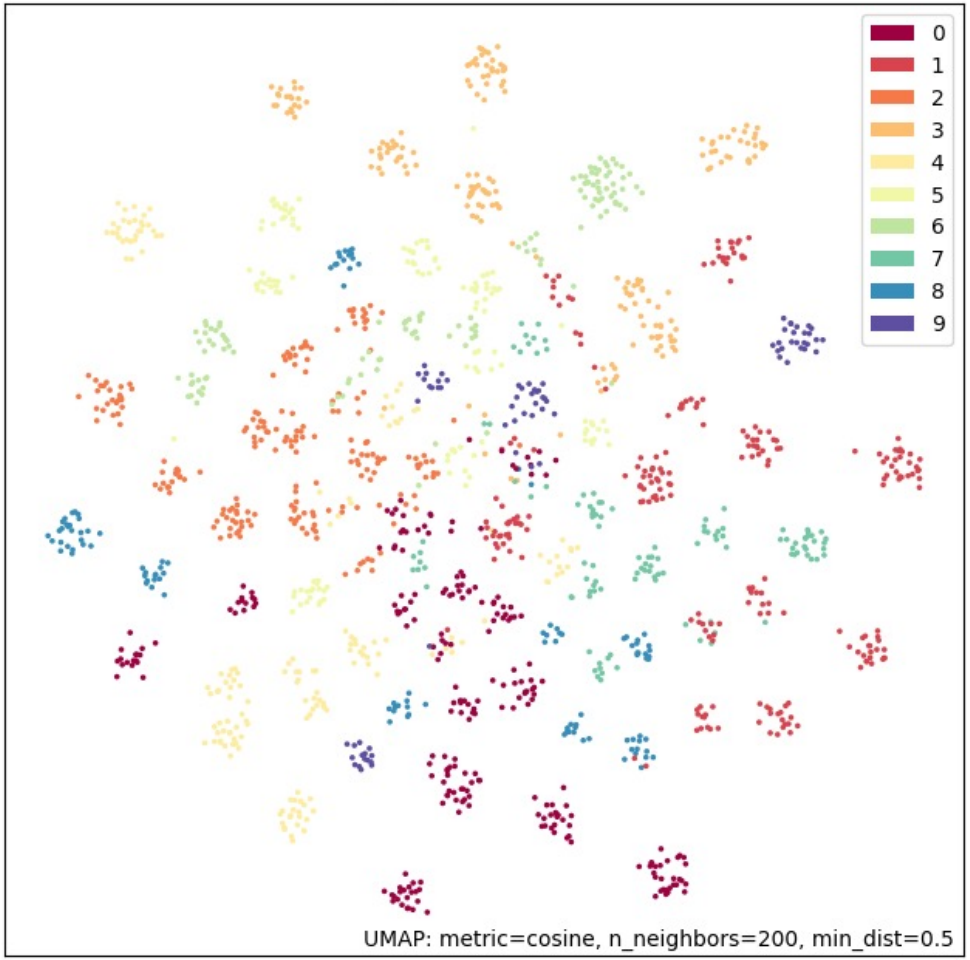
Topics 2010 - 2018



7
kacir
knez
bozi
cirkev
arcibiskup
mistr
svaty
krcma
uceni
farar

9
goddess
hillside
swallow
body
policeman's
birdie
postman
research
yoga
burrow

Topics 2010 - 2018



9
bohyne
kopanice
vlastovka
telo
policistuv
ptacek
postak
vyzkum
joga
doupe

9
goddess
hillside
swallow
body
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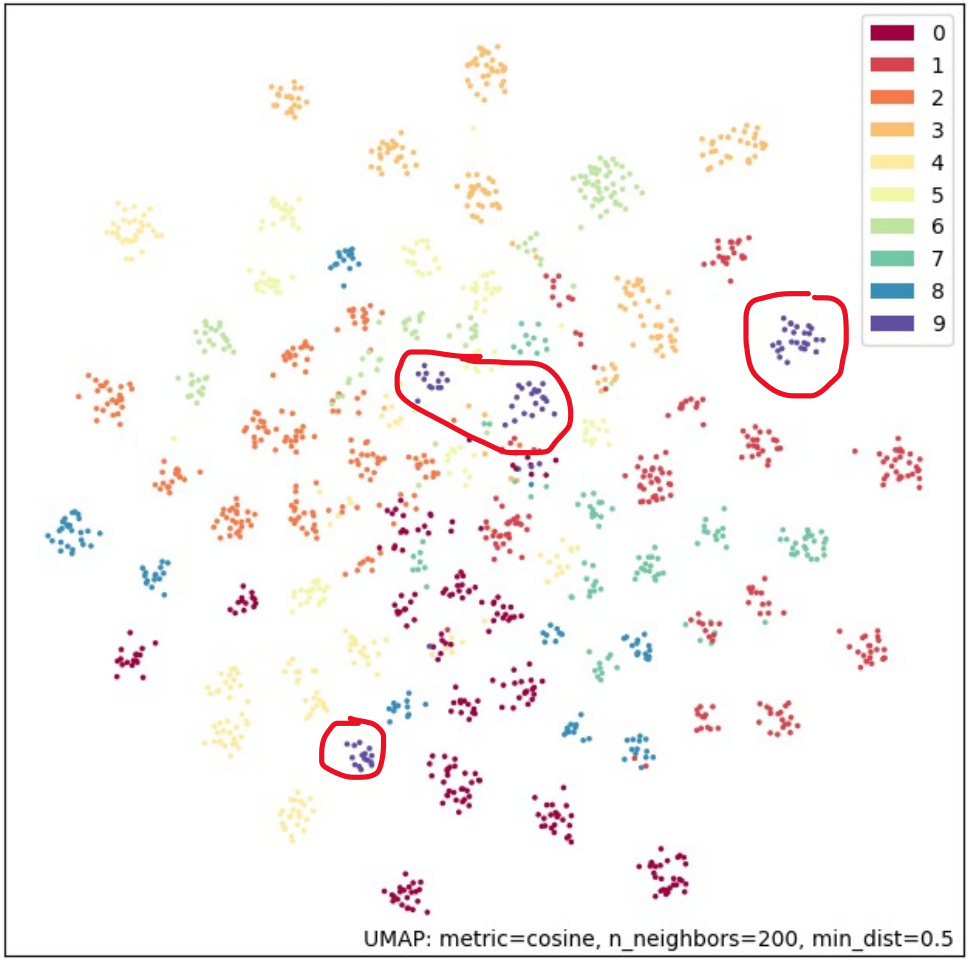
Topics 2010 - 2018

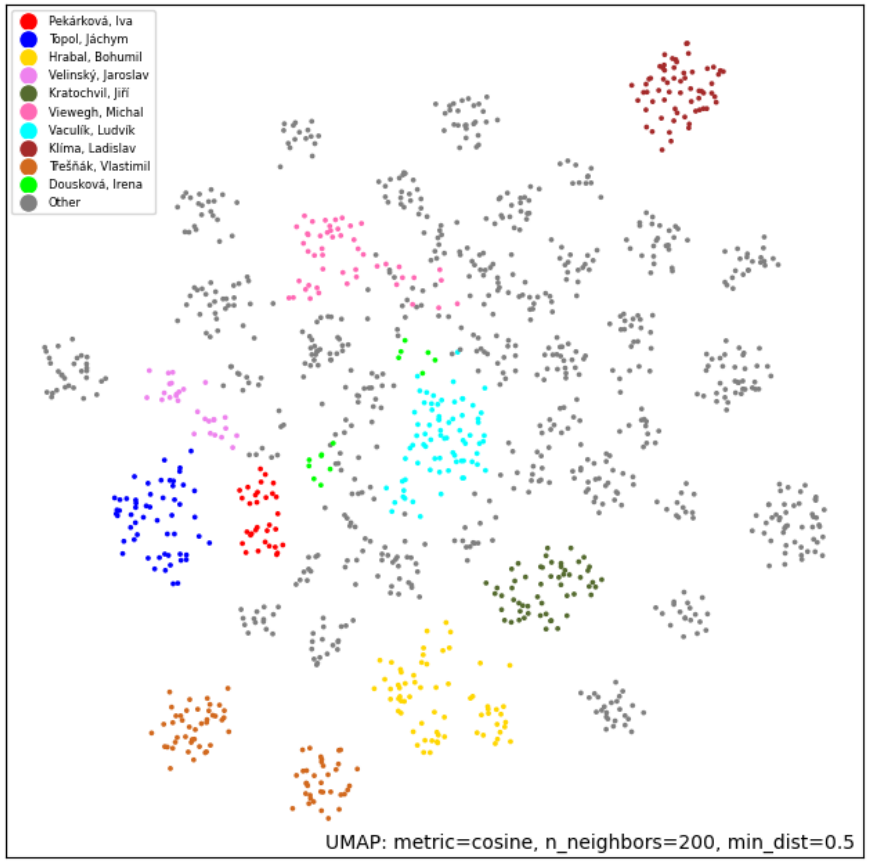


9
bohyne
kopanice
vlastovka
telo
policistuv
ptacek
postak
vyzkum
joga
doupe

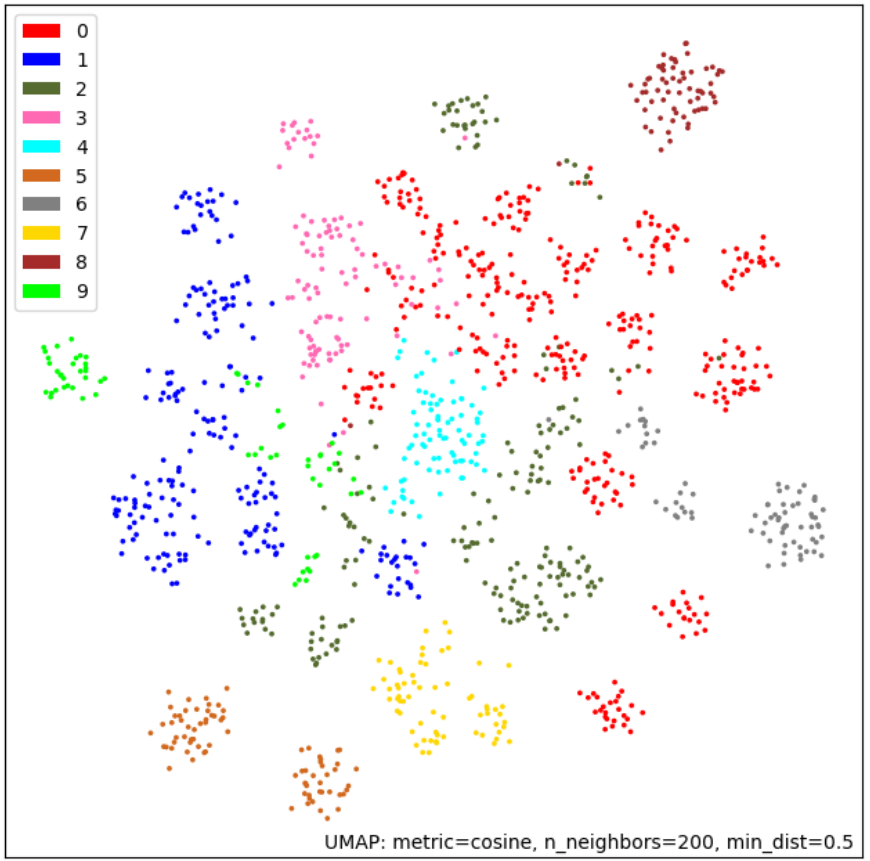
Observation

- Themes are fairly coherent
- Words are not always representative; it is necessary to look at specific works.
- Problem of dividing books into parts – the longer the book, the greater the weight.
- Authors stay within one topic cluster

Authors with Multiple Works in the Corpus 1990 - 1999



Topic clusters 1990 - 1999



Results

- What is a ‘topic' according to Top2Vec?
  - Motif, Theme
  - Genre
  - Author’s style
- Literary system?
- The words of the topics corresponded to literary trends only if the trend was clearly defined (eg. Communism)

Future work

- Representative corpus
- More robust model
- Comparison of multiple models

Thank you

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