From News to Summaries: Building a Hungarian Corpus for Extractive and Abstractive Summarization

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Automatic text summarization

Extractive

- Identify salient information in the text
- Typically selects a few sentences
- Computationally easier
- Coherence issues
- Redundancy issues
- No gold standard training sets

Abstractive

- Generate new text
- Length can be adjusted within reason
- Computationally harder
- Hallucination
- Factual errors
- Grammaticality
- Training data can be harvested

HunSum-2 dataset

Crawled and parsed 27 Hungarian news sites with leads from the CommonCrawl

- Title
- Lead
- Text
- Date, tags etc.

As an abstractive summarization task:

- Text →lead
- Text →title

Cleaning

- Constraints on the length:
  - Lead characters < article characters
  - Minimum article characters: 200
  - Maximum article characters: 15000
  - Minimum lead tokens (~words): 6
  - Maximum lead sentences: 5
  - Minimum article sentences: 6
- Remove non-Hungarian articles with fastText
- Article and lead deduplication with LSH - 0.45 threshold
- Minimum lead-article similarity using sentence-transformers - 0.17 threshold
- 1.82M articles in total

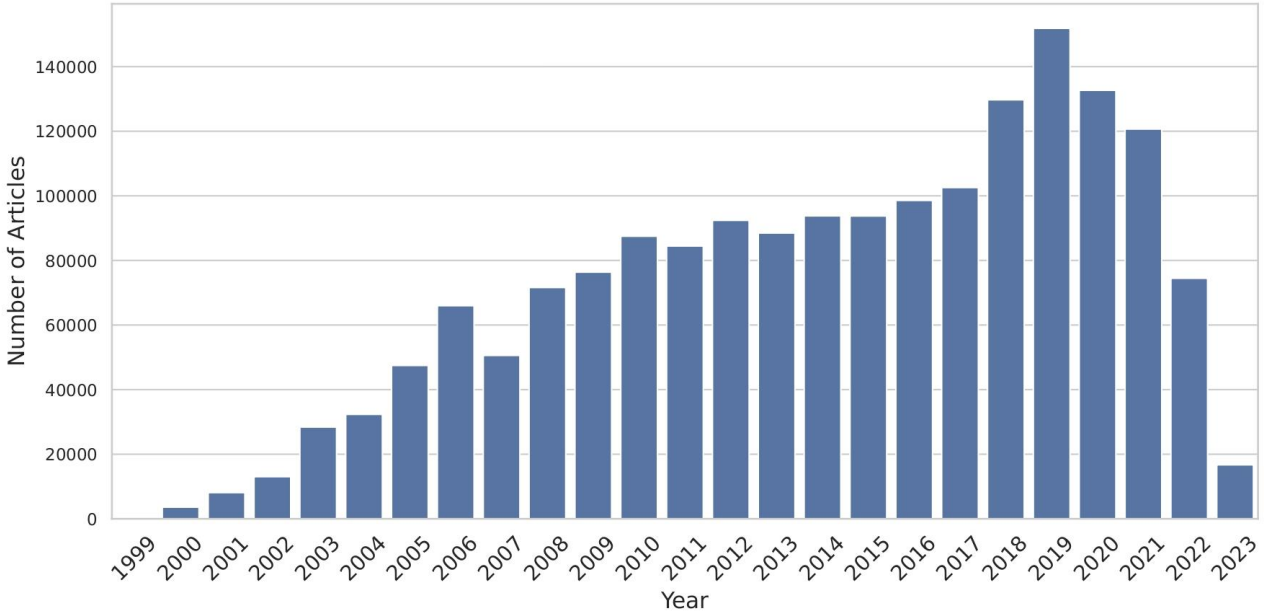
Dataset statistics

- Novel N-gram ratio (NNG-n)
- Compression (CMP)
- Redundancy (RED-n)

Dataset	NNG-1	NNG-2	NNG-3	CMP	RED-1	RED-2
CNN/DM	13.20	52.77	72.22	90.90	13.73	1.10
XSum	35.76	83.45	95.50	90.40	5.83	0.16
XL-Sum (English)	32.22	80.99	94.57	92.97	6.56	0.20
HunSum-2	41.12	77.31	88.74	89.1	11.78	0.51

Dataset statistics

1.82M articles after cleaning and deduplication



regional	346k
24.hu	307k
origo.hu	293k
hvg.hu	206k
kisalfold.hu	161k
index.hu	159k
delmagyar.hu	153k
nlc.hu	100k
nepszava.hu	28k
portfolio.hu	23k
m4sport.hu	20k
metropol.hu	12k
telex.hu	6k

Extractive Dataset

Requires binary labeling at sentence level

- Calculate sentence embeddings for lead and article sentences
  - Using paraphrase-multilingual-MiniLM-L12-v2 from the sentence-transformers package
- Assessing similarity by cosine distance.
- Select the most similar sentence from the article for each sentence in the lead
- Maximize the total similarity across all summary sentences
  - Assignment problem

Baseline Models

- Abstractive
  - Bert2Bert
    - Encoder-Decoder based model
    - Both side initialized with the pretrained huBERT
  - mT5
    - Pretrained multilingual transformer
- Extractive
  - BERTSum
    - BERT based encoding
    - Extra CLS tokens before each sentence
    - CLS token classification

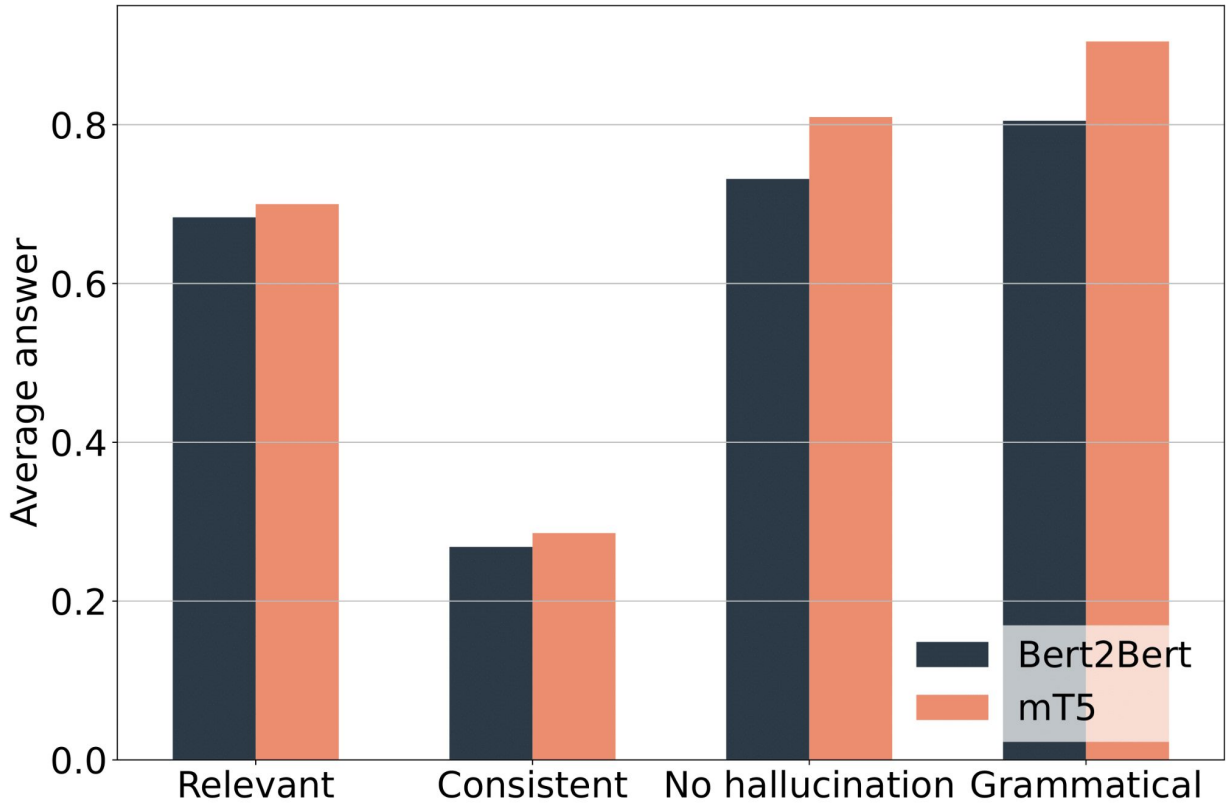
Results

Model	R-1	R-2	R-L	BertScore
Bert2Bert	40.95	14.18	27.42	78.81
mT5-base	40.06	12.67	25.93	78.64
extractive	**49.85**	**20.12**	**33.46**	**79.18**
hi-mbart-large-50	31.63	13.26	22.82	77.77
hi-mt5-base	29.53	11.34	21.35	76.99
foszt2oszt	26.87	8.03	20.19	75.84

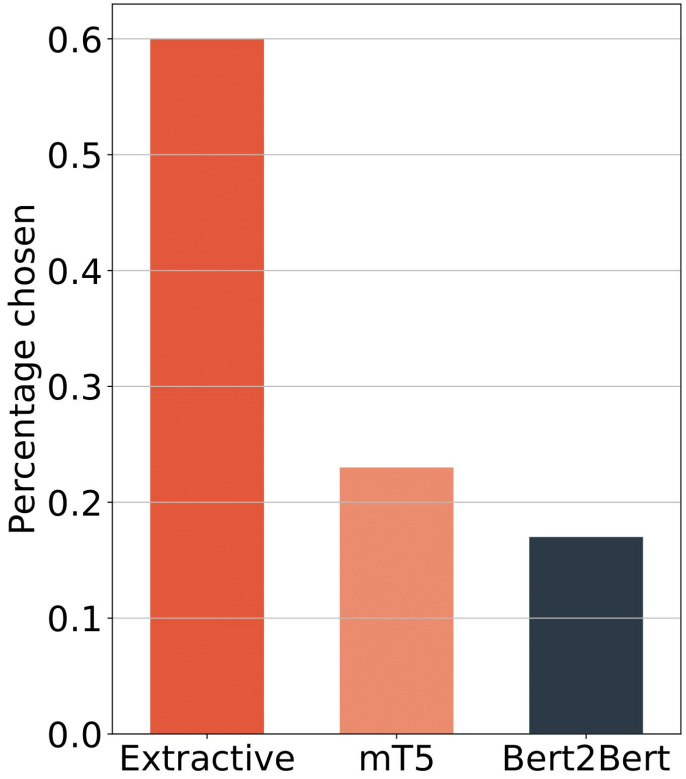
Human evaluation

- 60 article
- 4 annotators
- Every article is evaluated by 3 annotators
- Questions:
  - **Relevant**: Does the summary convey what the article is about?
  - **Consistent**: If the answer to **Topic OK** is Yes, does the summary only contain information that is consistent with the article?
  - **No hallucination**: If the answer to **Topic OK** is Yes, does the summary only contain information that can be inferred from the article?
  - **Grammatical**: Is the summary grammatically correct?
  - **Best model**: Which model created the best summary?
- Average pairwise Cohen kappa: 60%

Human evaluation



Human evaluation



Key Takeaways

- **HunSum-2**: Largest open-source Hungarian corpus for abstractive and extractive summarization
- Thorough cleaning, preprocessing and deduplication
- Baseline models
- Human evaluation on 60 articles with 4 annotators and 5 questions
- Our code: https://github.com/botondbarta/HunSum
- https://huggingface.co/datasets/SZTAKI-HLT/HunSum-2-extractive
- https://huggingface.co/datasets/SZTAKI-HLT/HunSum-2-abstractive