

# Fake news: an algorithmic approach

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## 2 Research question

The following research question is defined: *how well can pre-trained language embedding techniques classify fake news?*

For this research question, the following subquestions will be answered:

- RQ1: How can fake news be defined and characterized?
- RQ2: Which pre-trained models are available for embedding raw text?
- RQ3: What is the performance of combinations of pre-trained embedding techniques with machine learning algorithms?
- RQ4: To what extent can performance of fake news classifiers be improved with increased amounts of raw data?

## 3 Related Work

### 3.1 RQ1

Fake news as a term only caught public attention starting from the end of 2016, during the Presidential Elections of the United States [7].

### 3.2 RQ2

In the last couple of years, using transfer learning for natural language processing has given promisable results. The following sentence embeddings will be used to detect fake news:

- Bag of Words as a baseline for performance of non-pretrained embeddings;
- Facebook’s InferSent [1];

- ELMo from the Allen Institute for Artificial Intelligence [5];
- OpenAI’s GPT-2 [6];
- Transformer-XL [2];
- Microsoft’s MT-DNN [4];
- and Google’s BERT [3].

### 3.3 RQ3

Aligned with the original research on this dataset by Wang [8], the following machine learning algorithms will be used to test the applicability of the abovementioned embedding techniques:

- SVMs;
- Logistic regression;
- Bi-LSTMs;
- CNNs.

## References

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