Machine Learning models with Natural Language Processing as a usable online tool for fake news detection

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Motivation

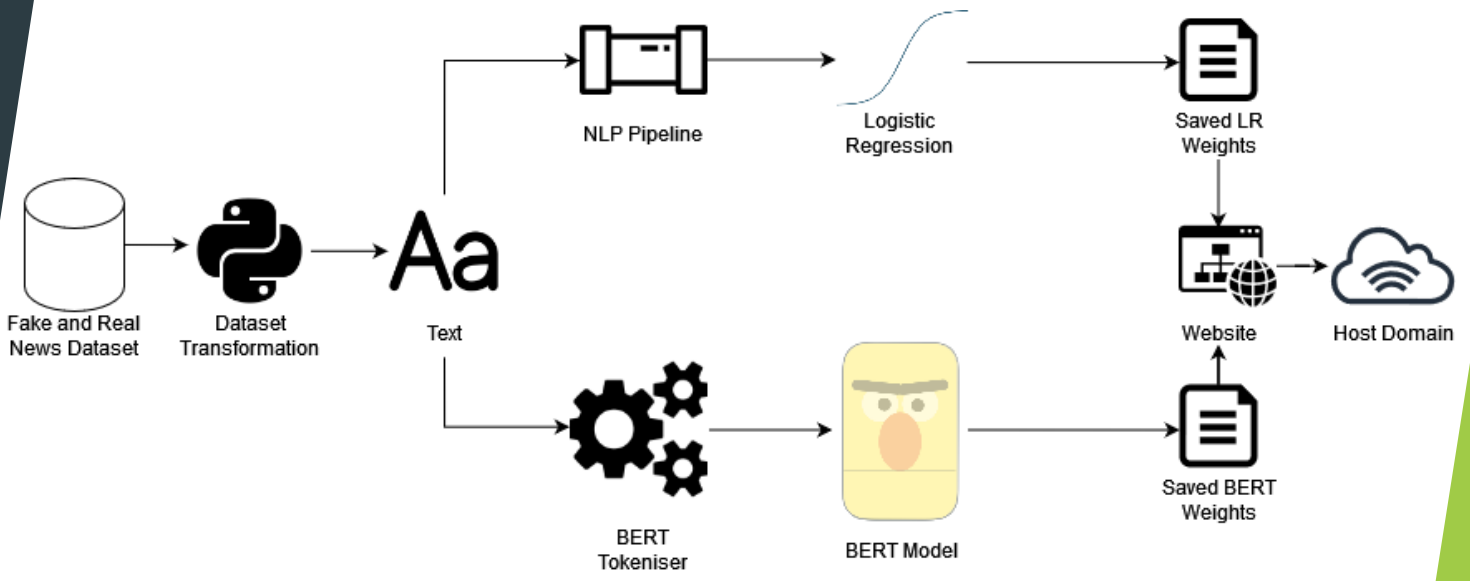
- Fake News spread all over the Internet
- Twitter changing policies
- Human accuracy – 54%
- Trove of literature available online about similar models, but no tools available

Requirements/Goals

- Must Have:
  - Acquisition of a large dataset
  - Two ML models using NLP
  - Better than human performance (54%) for model prediction
- Should Have:
  - Web Application as the tool
  - Tool accessible to any online user
- Could Have
  - User ability to choose model
  - Multiple feature engineering

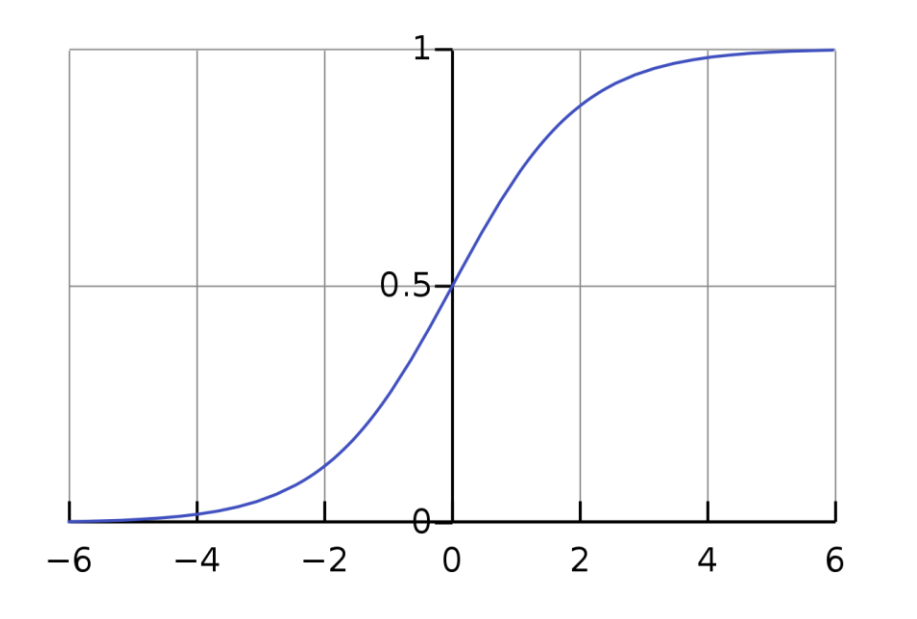
Design

- Dataset analysis
- Information extraction
- Text transformation
- Model training
- Web application development
- Online domain

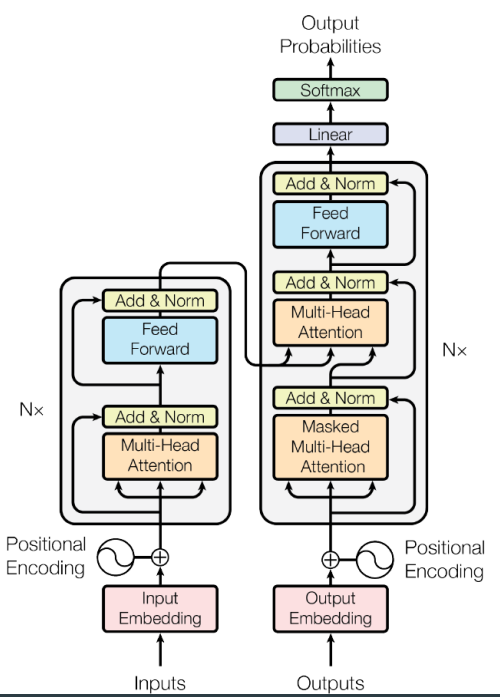


Two Machine Learning Models

Logistic Regression



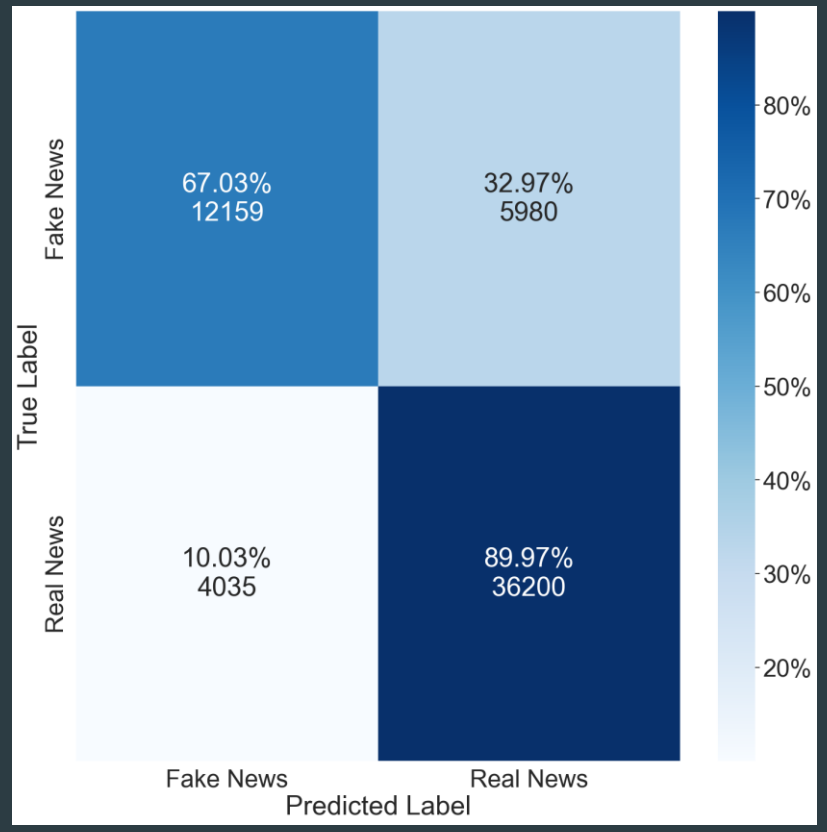
BERT



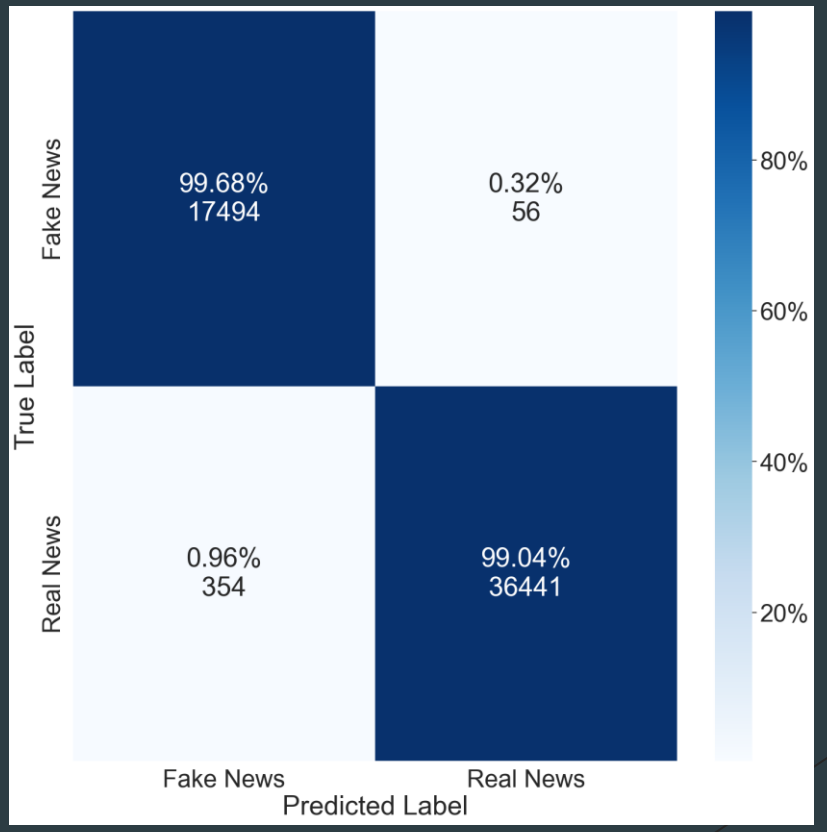

Demonstration

Evaluation

Logistic Regression: **82.6%** F1



BERT: **99.4%** F1



Further Improvements

- Include multilingual processing
- Fix skewed confusion matrix
- Reduce over-fitting:
  - Include more diversity of Tweets
  - Include a broader time period of the political landscape
  - Standardise dataset for phrase appearance in different classes
- Introduce continuous training

Conclusion

- Impressive scores for the dataset
- Generalisability could be improved
- Tool available online: http://fakenewsuofg.pythonanywhere.com/

Thank you for your attention!