

Deep Learning Based Authorship Identification

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Mentor:

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Problem Description: What is the problem that you will be investigating? Why is it interesting?

Description: Provided an article or some paragraphs of a work, we will tell who is the author, e.g., inputting parts of Hamlet into our model, Shakespeare will be claimed as the author.

- (1) This work can explore and tell the difference between different writing styles of authors.
- (2) This work can help recommend to readers the authors having similar writing styles with their favorite authors.
- (3) This work can help find the original source or similar works of an article and help detect plagiarism/ghost-writers between articles.

Data:

We can easily obtain data from database of various news agencies. There is a Reuters RCV1 news article dataset is used to develop our multi-level machine learning algorithms hosted by UC, Irvine, which proves useful.

Methodology/Algorithm

For word vectors, we can start with GloVe vectors for encoding and then move on to other neural-network trained word vectors. We can also try to train our word vectors specifically for this application by building on a pretrained model.

We have designed three steps for our model: first we will apply SVM to predict the author, and then build a RNN based on tensorflow. LSTM/GRU and other techniques will be explored to improve the performance this RNN based model. At last, we will try to refine the structure of the neural networks to get an even better result.

Related Work:

- [1] News Authorship Identification with Deep Learning, Liuyu Zhou et al
- [2] Writeprints: A stylometric approach to identity-level identification and similarity detection in cyberspace
- [3] Raghavan S, Kovashka A, Mooney R. Authorship attribution using probabilistic context-free grammars[C]//Proceedings of the ACL 2010 Conference Short Papers. Association for Computational Linguistics, 2010: 38-42.

Evaluation Plan:

The loss can be defined using cross-entropy. The accuracy of identification can be easily measured by precision and recall. Also, F1 score can be calculated. The evaluation above can be plotted vs training epochs, regularization values and can be compared across different algorithms on a plot. Furthermore we can also construct a confusion matrix to visualize the result for each model/algorithm.