CM3060 Natural Language Processing

Project Idea Title 1: Fake news detection

What problem is this project solving?

Can you tell the difference (programmatically) between real and fake news?

What is the background and context to the question above in 150 words or less?

We live in an age of information, disinformation and misinformation. Can you tell the difference? Fake news is disinformation and misinformation spread through social media and other online forums. It often consists of hoaxes, groundless conjecture and exaggerated, unfounded claims. This may be done to promote certain ideas or beliefs and is often associated with specific political agendas. Fake news is often further propagated by algorithmic means, resulting in users being trapped (willingly or otherwise) in their own filter bubble.

List some recommended sources for students to begin their research

- https://data-flair.training/blogs/advanced-python-project-detecting-fake-news/
- https://en.wikipedia.org/wiki/Fake_news
- https://www.bbc.co.uk/news/topics/cjxv13v27dyt/fake-news
-

What would the final product look like?

(e.g. presentation, usability, functionality, results)?

The output should be a software module that differentiates between real and fake news, as described above. It should be embodied as a Jupyter Notebook, using Python. This should consist of sections such as the following:

- Analysis / exploration of the data set
- Identification of suitable features and implementation of a suitable feature extractor, e.f. TfidfVectorizer
- Implementation of appropriate ML classifier(s)
- Some evaluation of the output, e.g. confusion matrices, accuracy, etc.

What would a prototype look like?

What would it show?
What does it need to prove?
*What **IS** important to make clear?*
*What is **NOT** important at this stage?*

A basic data processing pipeline and a very basic classifier that can act as a baseline for future evaluation (e.g. keyword spotting). This does not need to have high accuracy at this stage, just demonstrate the pipeline.

What kinds of techniques/processes are relevant to this project?

- Feature extraction
- Classification algorithms
- Evaluation methods

What would the output of these techniques/processes look like?

- Feature extraction: an appropriate set of features
- Classification algorithms: a comparison of various methods
- Evaluation methods: some analysis of their performance

How will this project be evaluated and assessed by the student (i.e. during iteration of the project)?

What criteria are important?

By accurately differentiating between real and fake news, and applying an objective evaluation function.

For this brief, what would a minimum pass (e.g. 3rd) student project look like?

- An implementation comparable with published studies (see above)
- An accuracy score comparable with published studies
- A suitable evaluation of the method

For this brief, what would a good (e.g. 2:2 – 2:1) student project look like?

- An investigation of multiple methods
- A high quality evaluation and comparison of the methods using good quality evaluation methods
- An accuracy score comparable to the benchark set in published studies

For this brief, what would an outstanding (e.g. 1st) student project look like?

- An investigation of multiple methods
- An evaluation of the methods to the standard of academic research
- An accuracy score equal to or above the benchark set in published studies
- Some insight into the explainability of the methods, e.g. which features are indiciative of fake news