Advanced Natural Language Engineering (G5114): Assessed coursework 1

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Format	Submit a single zip file containing 1 pdf and an appendix of your code (which may be a `.ipynb` or a `.py` file)
Word Count	8 pages (approx. 3000 words) plus code appendix
Due date	Submit your assignment online before **4pm on Friday 28th April (week 11)**. Submissions will be accepted up to 7 days late but there is a penalty for this.
Marking	You will be told your mark and receive feedback via Canvas before Friday 19th May
Weighting	This assignment is worth 60% of your mark for this module.

1 Practical assignment (3000 words): Propaganda Detection

You are provided with a zipfile `propaganda_dataset`. This includes 2 files with identical format: one for training and one for testing. Each file is in tab-separated-value (tsv) format with 2 columns as illustrated below.

label	**sentence**
flag_waving	I want to get <BOS> our soldiers <EOS> out.
not_propaganda	Our older measure of <BOS> American Worker Displacement <EOS> understated the problem.

The first column contains a **label** from a set of 9 possibilities which are

1. flag_waving
2. appeal_to_fear_prejudice
3. causal_simplification
4. doubt
5. exaggeration,minimisation
6. loaded_language
7. name_calling,labeling
8. repetition
9. not_propaganda

The first 8 labels are all propaganda techniques and are a subset of those identified in the Propaganda Techniques Corpus (Da San Martino et al., 2020). The final label `not_propaganda` indicates that no propaganda has been identified in the text. The second column contains a **sentence** or chunk of text where the propaganda technique has been identified (or no propaganda has been identified in the case of `not_propaganda`). Note the use of additional tokens <BOS> and <EOS> which indicate the beginning and end of the span of text (within the sentence) which is actually annotated with the given propaganda technique. In the first example above, the span of text "our soldiers" has been identified as an example of `flag_waving` in the context of the sentence "I want to get our soldiers out."

Your tasks are as follows:

1. Build and evaluate at least 2 approaches to classify whether a sentence contains propaganda or not.
2. Given a snippet or span of text which is known to contain propaganda, build and evaluate at least 2 approaches to classifying the propaganda technique which has been used.

In this assignment you are expected to complete both tasks above and investigate **at least 2** different approaches to making classification decisions. The approaches used for task 2 may be the same or different to the approaches used in task 1. Your solution does not need to be novel. You might choose to investigate 2 of the following approaches or 1 of the following approaches and 1 of your own devising.

- Text probability based on n-gram language models
- Text similarity or classification based on uncontextualised word embedding methods e.g., word2vec
- Neural language models
- Pretrained large language models e.g., BERT

It does not matter how well your method(s) perform. However, your methods should be clearly described, any hyper-parameters (either fixed, varied or optimised) should be discussed and there should be a clear comparison of the approaches with each other - both from a practical and empirical perspective.

1.1 Resources

You have been provided with the training and test data for this task with the assignment. You may (and are expected to) use any of the code that you have developed throughout the labs. This includes code provided to you in the exercises or solutions. You may use any other resources to which you have access. You may also download other resources from the Internet and make use of any Python libraries with which you are familiar. All code that you use (libraries, lab solutions and open source code) should be probably accredited within your code base and within your report e.g., "my function for X is adapted from code available at Y"

1.2 Report

Your report should be in the style of an academic paper. It should include an introduction to the problem and the methods you have implemented. It might contain a brief discussion of related work in the area but the focus here should be on your practical work rather than producing a comprehensive literature review. Also, make sure you describe your solution and not just the theoretical background of the approach. For example, the theoretical background on how word embeddings are learnt using word2vec might be useful to motivate your approach but does not constitute a description of your method to solving the task using word2vec - there are many ways word2vec can be used to provide a solution and it is this that you should focus on in the description of your method. You should also make sure you discuss any hyper-parameter settings - both those which you have decided to fix and any which you are investigating. Justify your design decisions. You should discuss and justify the method of evaluation. You should provide your results and compare them with any baselines. You should also provide some analysis of errors - do the approaches make the same or different mistakes and can you comment on the types or causes of errors being made? You should end with your conclusions and areas for further work. You should also submit your code as an appendix. Your report (including figures and bibliography but not including code appendix) should be no longer than 8 sides (3000 words of text plus figures and bibliography). Your code in the appendix should be clearly commented.

Marks will not be awarded simply for how well your system does or for programming wizardry. Marks will be awarded for clearly evaluating possible solutions to the tasks set out above.

2 Marking Criteria and Requirements

This coursework will be marked out of 100. Table 1 shows the number of marks available for each requirement.

Requirement	Max mark	Interpretation
problem outline	10	Does the introduction explain the task including why it is important and challenging?
method	25	Is there a clear description of the proposed methods for tackling the tasks? Do the proposed methods seem sensible? Novel or more interesting methods may score highly here (if well-described) but methods will not necessarily gain more marks simply by being more ambitious.
hyper-parameter settings	10	Within each proposed method, are there any hyper-parameter settings which are being fixed or explored? Are these clearly explained?
evaluation	20	Have a reasonable number of results been produced? Is the method of evaluation stated, explained and justified? Are results clearly presented (in a table and/or a graph!)?
analysis	15	Is there an analysis of errors of the methods? Are there particular types of input which one or both methods do badly at?
conclusion	5	Are sensible conclusions drawn throughout the work? Is the final conclusion sensible and consistent?
further work	5	Are there sensible suggestions for further work to do in this area. These might include improvements to the methods, other methods or other applications of the methods.
academic style	5	Is the report written in the style of a research paper? Are major points backed up with references? Is the report well-written and well-structured?
code appendix	5	Is the code in the appendix clear and correct?

Table 1: Breakdown of marks

For each requirement, the following scale will be used when deciding the number of marks awarded.

85%-100% Outstanding. Demonstrates a thorough understanding and appreciation of the material without significant error or omission; evidence of extra study or creative thought

70%-84% Excellent. Demonstrates a thorough understanding and appreciation of the material producing work without significant error or omission

60%-69% Very good. Clear understanding demonstrated, substantially complete and correct. There may be minor gaps in knowledge/understanding. Evidence of independent thought

50%-59% Reasonable knowledge and understanding of basic issues demonstrated.

45%-49% Basic knowledge and understanding demonstrated with some appreciation of the issues involved. Gaps in knowledge and understanding; confusion over more complex material.

40%-44% Significant issues neglected with little or no appreciation of the complexity of the problem.

20%-39% Some correct or relevant material but significant issues neglected / sig. errors or misconceptions

0%-19% Very little or nothing that is correct and relevant

References

Giovanni Da San Martino, Alberto Barrón-Cedeño, Henning Wachsmuth, Rostislav Petrov, and Preslav Nakov. 2020. SemEval-2020 task 11: Detection of propaganda techniques in news articles.