17/10/2019   Meeting 2

Aim: To choose a theme to work on and *stick with* - one that is considered challenging enough to get a high mark. Then, talk about project themes and research questions

➔ Mention that you are aiming for a first

1. How can anomaly detection apply to social media textual data?
☐ **Much of what I have found online is applied to networks and analysing network traffic / user activity rather than their language**

- Anomaly detection can refer to anything that's not within the normal behaviour of a social media user
- Social networks may build up a profile of you and may discover that ur behaviour is different from how you normally act
- We could also take a dataset, and combine it with some anomalous data (add anomalies that we can then detect)
- Classification problems are considered to be equivalent in terms of how Noura regards them - for example, sarcasm detection could be anomalous as we are not sarcastic all the time (can sarcasm be detected from a dataset of normal tweets?)
- Anomaly detection can cover all sorts - Noura is using it as a broad term for detecting differences in social media textual data

2. Discuss the following potential applications
➔ **Fake news detection**
☐ We discussed fake news detection over email
☐ Concerned that a model trained on narrow data couldn't be applied to other datasets (makes redundant a section of the final paper) - means that I cannot evaluate performance on other models
☐ Will I be penalised for not implementing anomaly detection, is a classification problem considered to be hard enough?

- Probably stay away from this - in order to do it properly, we need to measure the credibility of source and the sentiment of the people writing about it
- Not only about text
- No datasets exist that are good enough

➔ **Sarcasm detection**
- Detect contradicting polarity of sentiment means that it can be applied to other datasets
- Possible dataset - https://github.com/rishabhmisra/News-Headlines-Dataset-For-Sarcasm-Detection
- Possible dataset - RumourEval from SemEval2017
- This one seems like the best option

➔ **Stance detection**
  seems very interesting, but is it considered challenging enough
- Deciding if the author of a piece of text is in favor of the target or against it
- Possible dataset - RumourEval from SemEval2017
- Similar to sentiment analysis (is this hard enough)?

- Would require a lot of data
- Still will be hard to generalise

3. Could we discuss potential project themes / literature survey for the sarcasm detection application?

Introduction - the introduction is about convincing the external marker that the problem is difficult enough to be awarded a high mark for the solution (got to prove to the external marker why it is hard)
☐ Include some statistics about sarcasm detection
☐ Include references to these stats
☐ Potential applications of sarcasm detection e.g. medical Applications - could be useful for autistic people who cannot process social cues and unusual social phenomena such as sarcasm
☐ Explain why normal sentiment analysis is not as complex as the sarcasm detection task (STATE THAT) - for example, the difference in sentiment polarity will confuse a normal sentiment analyser
☐ Talk about human accuracy and cultural differences in detecting sarcasm

Project themes Ideas (suggested by Noura)
  1. Feature extraction creating embeddings e.g. neural networks (word 2 vec, glove, then contextual embeddings with Elmo and Burt)
  2. Different classifiers, traditional classifiers and deep learning approaches

- Break each section down into standard linguistic approaches, machine learning approaches and deep learning approaches

4. Discussed in the previous meeting that a potential advanced deliverable could be to show what triggered the decision to classify a statement
◆ During my research, I couldn't find any techniques of doing this as it seems as though deep learning models are fairly 'black-box'
◆ Do you know any techniques for this or should we remove this as an advanced deliverable?

5. Discuss potential research questions
Possible Research Questions:
- How can traditional anomaly detection techniques be applied to the detection of fake news in social media
- How do machine learning approaches compare to deep learning techniques for fake news detection
- What features of a dataset make it suitable / effective for these purposes?
- How can we evaluate the performance of a model?
- Can this model adapt / perform well on other data sets?

6. Which student achieved over 90%, what was their project theme and what made it so good?
Matthew Peart
Network intrusion detection - did something new, novel and creative
- In general, you don't get above 80 if you don't do something novel and new
- Always think outside of the box

7. Do you have any pointers for research areas

Tasks for next week:
- Investigate Data Sets And Produce Some Statistics
- E.G. Max, Min, Avg And Medium Of Sentence Length
- Examples Of Sarcastic And Non-sarcastic
- Standard deviation
- Balanced or unbalanced
- Is it about sarcasm and sentiment (implement own sentiment detection and apply to the dataset - using existing libraries)

COMMENTS:
We are mainly using labelled data, therefore in general, do not crawl your own twitter data as you will have to annotate it
- Additionally, someone else will also have to check the annotations (not practical)
- Train models on the NCC (the supercomputer)
- Do lit review once you know more about the research area
- Linguistics, machine learning, deep learning

Dataset Ideas

`Datasets for fake news detection`
`Ranked:`
1. FakeNewsNet
2. Liar
3. Kaggle
4. Buzzfeed News

`Fake News Net`
https://raw.githubusercontent.com/KaiDMML/FakeNewsNet/master/dataset/politifact_fake.csv

Or https://www.kaggle.com/mdepak/fakenewsnet
- Provides tweet id of accounts twitter accounts sharing the news (allows for the collection of metadata on tweets if they still exist in their raw form)
- What makes this one different is that it provides social context (e.g. the number of retweets the tweet received and the number of followers of the person who posted it - could be useful in detecting if the fake news tends to come from fake accounts)
- Combines a few datasets

`The "Liar Dataset"`
https://arxiv.org/abs/1705.00648   //paper
https://github.com/nishitpatel01/Fake_News_Detection/tree/master/liar_dataset
- Explains that the data is manually labelled by an editor of Politifact.com - suggests high quality
- Provides lots of metadata
- Roughly 10000 entries in the training set, 1200 in the validation set and 1200 in the testing set

`Buzzfeed News Dataset`
https://github.com/BuzzFeedNews/everything#standalone-datasets

`Noura's Links`
http://alt.qcri.org/semeval2016/task6/
https://dataverse.harvard.edu/dataset.xhtml?persistentId=doi:10.7910/DVN/83KYJY
https://www.kaggle.com/c/fake-news/data

`- Sentiment analysis practice dataset`
// More useful for the practice of cleaning tweets
https://datahack.analyticsvidhya.com/contest/practice-problem-twitter-sentiment-analysis/