Depression Detection

- Week 3

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Undergraduate 4th year
Duration of the presentation: ~10 minutes

Agenda

1. **Results of implementing DEPTWEET methodolgy**
    1. Comparison of results with DEPTWEET paper
    2. Comparison of results with HelaDepDet
2. **Results of implementing an LSTM based approach on DAIC-WOZ**
3. **Anxiety detection from free-form speech**
    1. Summary and Analysis of applicability for our work
    2. DAIC-WOZ dataset analysis from their implementation
4. **Tentative plan for the week**

DEPTWEET Methodology Implementation

[1] DEPTWEET: A typology for social media text to detect depression severity (Kabir et al, 2023) | Paper | Dataset | Code

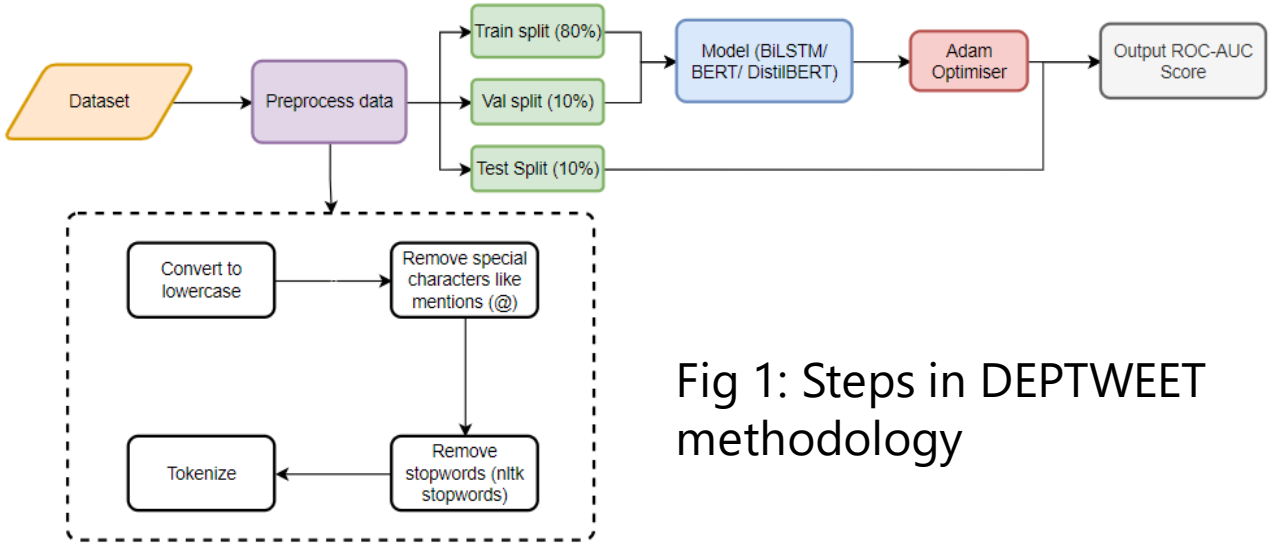

Fig 1: Steps in DEPTWEET methodology

Table 1: Comparison of results on implementation with paper's [1] results

Implemented by	Train dataset	Test dataset	BiLSTM	BERT	DistilBERT
DEPTWEET pa per [1]	DEPTWEET	DEPTWEET	0.91	0.77	0.80
Me	DEPTWEET	DEPTWEET	0.89	0.94	0.94
Me	HelaDepDet	HelaDepDet	0.78	0.935	0.94
Me	HelaDepDet	DEPTWEET	0.88	0.675	0.65

DEPTWEET Methodology Comparison

Table 1: Comparison of results on implementation with paper's [2] results

Method	Train	Test	Precision	Recall	F1
HelaDepDet paper [2]	HelaDepDet	HelaDepDet	0.68	0.65	0.66
DEPTWEET methodology [1] (DistilBERT)	HelaDepDet	HelaDepDet	0.77	0.74	0.74
DEPTWEET methodology [1] (DistilBERT)	HelaDepDet	DEPTWEET	0.74	0.54	0.61

[1] DEPTWEET: A typology for social media text to detect depression severity (Kabir et al, 2023) | Paper | Dataset | Code
[2] HelaDepDet: A Novel Multi-class Classification Model for Detecting the Severity of Human Depression | Paper | Dataset

LSTM based approach on DAIC-WOZ

Model	Accuracy	Loss
Model 1 – 1 LSTM (Mine)	0.98	0.19
Model 1 – 1 LSTM ([3])	0.98	0.055
Model 2 – 2 LSTM (Mine)	0.92	0.22
Model 2 – 2 LSTM ([3])	0.91	0.29

Table 4: Comparison of Implementation and paper results [3]

personId	question	response
300	where are you from originally	atlanta georgia

Table 3: Sample from transcript dataset

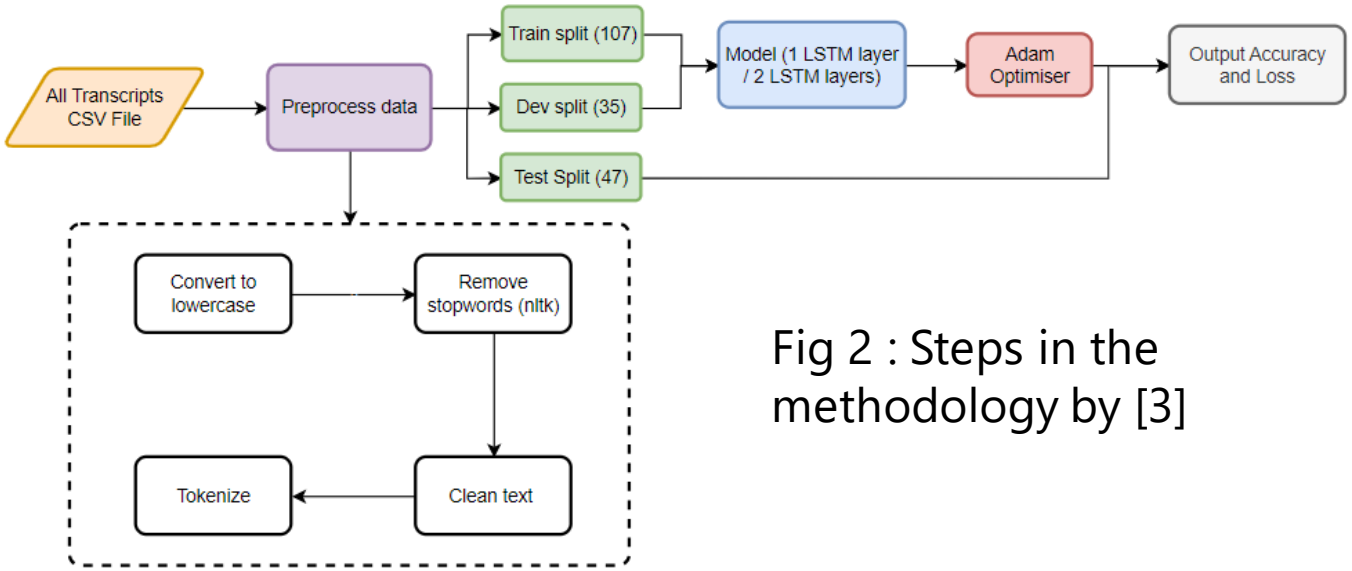

Fig 2 : Steps in the methodology by [3]

[3] Detecting Depression: How to have a happier campus (Braganca et al, 2019) | Paper | Code

Anxiety Detection from free-form speech

Table 5: Summary of work by [4]

Dataset	Model	Precision	Recall	F1	AUC-ROC
Kintsugi Mindful Wellness Inc anxiety dataset	SentenceBERT embedding and GBC	0.64	0.57	0.60	0.68
	Weights based on GAD-7 score	0.61	0.55	0.58	0.59
	Standard RoBERTa models for audio and text (multimodal)	0.66	0.60	0.61	0.68

[4] Detecting anxiety from short clips of free form speech (Agarwal et al, 2023) | Paper | Code

Dataset Analysis

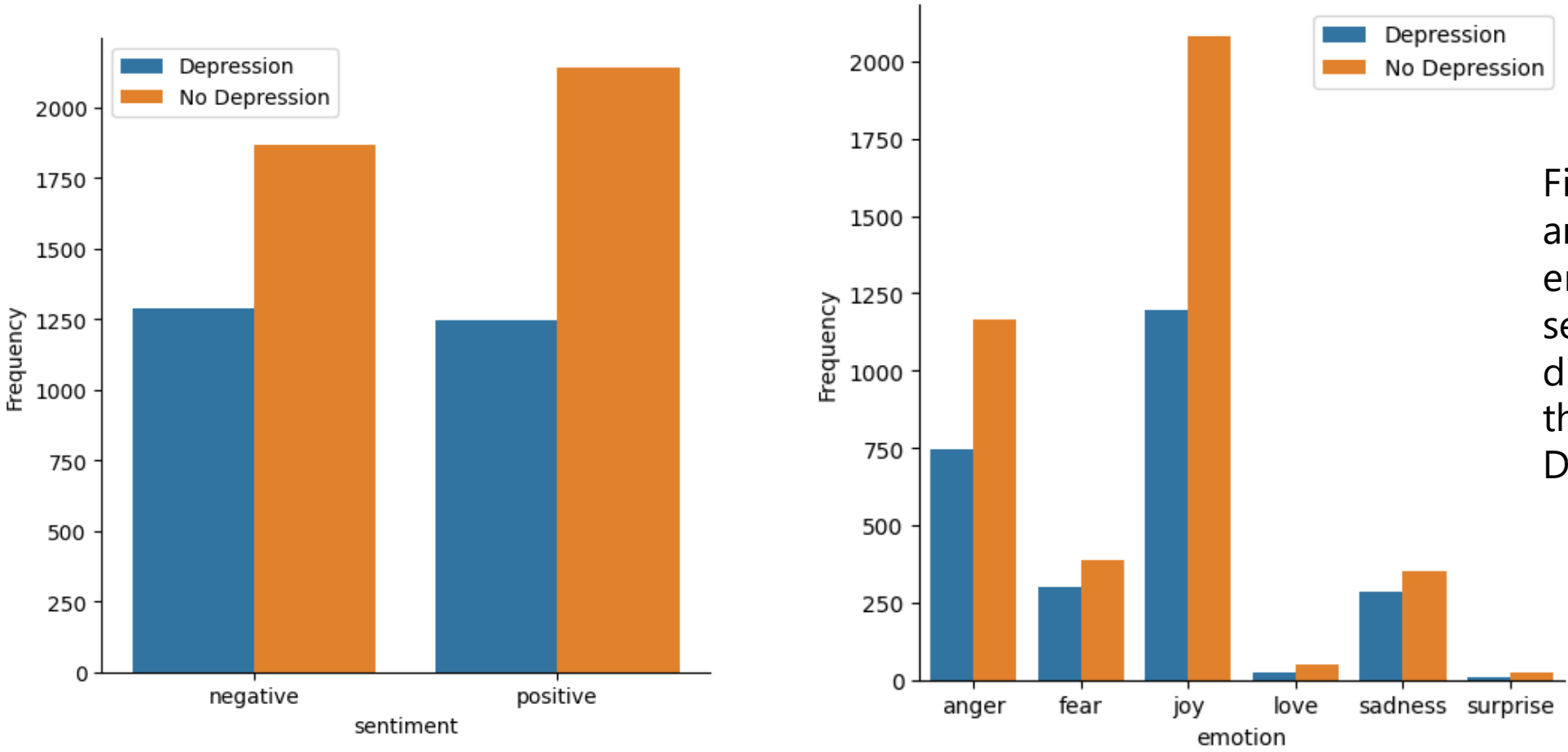

Fig 3: Graphs analysing the emotion and sentiment distribution along the lines of [4] on DAIC-WOZ dataset

[4] Detecting anxiety from short clips of free form speech (Agarwal et al, 2023) | Paper | Code

Tentative Plan

Plan for next week

1. Implement the rest of the anxiety detection code on DAIC-WOZ dataset
2. Continue reading relevant literature
3. Find codes that use question-answer pairs to emulate

Relevant Links

1. Overall project plan and timeline: Link
2. Analysis and notes from relevant papers: Link

End