Depression Detection

- Week 5

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Duration of the presentation: ~10 minutes

Agenda

1. **Anxiety Detection Methodology on DAIC-WOZ**
    1. Impact of removing stop words
    2. Preprocessing pipeline and results
2. **Experimentation with Yuxin's Code**
3. **Insights from the SOA Paper**
4. **Potential ideas for exploration**
5. **Tentative plan for next week**

Anxiety Detection Methodology on DAIC-WOZ

Table 1: Results from paper [1]

Precision	Recall	F1	AUC-ROC
0.64	0.57	0.60	0.68

Table 2: Results on running locally on DAIC-WOZ

Method	Precision	Recall	F1	AUC-ROC
Raw Text	0.59	0.51	0.60	0.65
No Stopwords	0.62	0.56	0.56	0.61
Data cleaning	0.68	0.57	0.57	0.65

Original Text	No Stopwords	Data Cleaning
Lately, I've not been feeling too great. I've not been enjoying food	lately, I've feeling great. enjoying food	lately I have not been feeling too great. I have not been enjoying food

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

Experimentation with Yuxin's Code

CNN + LSTM attention

Table 3: Yuxin's results

Epoch	Precision	Recall	F1	Accuracy
10	0.80	0.45	0.58	0.70

Table 4: Results on running Yuxin's code locally

	Epoch	Precision	Recall	F1	Accuracy
No change	10	0.63	0.52	0.57	0.61
With stopwords	10	0.54	0.65	0.67	0.57
Dropout	10	0.61	0.58	0.60	0.68
Early stopping	24	0.76	0.58	0.66	0.70
Dropout + ES	32	0.63	0.67	0.65	0.64

Changes tried out

1. Not removing stop words
2. Adding 1 dropout layer after each CNN layer with value 0.2
3. Adding early stopping on 'loss' metric with a patience of 5

Insights from the SOA Paper

Index	Question Description	Samples
Q1	How are you doing today?	184
Q2	How are you at controlling your temper?	176
Q3	What'd you study at school?	162
Q4	Is there anything you regret?	152
Q5	Have you been diagnosed with depression?	167
Q6	When was the last time you argued with someone and what was it about?	182
Q7	What advice would you give to yourself ten or twenty years ago?	177
Q8	What are you most proud of in your life?	171
Q9	When was the last time you felt really happy?	179
Q10	How easy is it for you to get a good night's sleep?	173

Index	Answer Description
Q1	uh i i feel i feel pretty good
Q2	i think i'm pretty good at it
Q3	uh i was i took two semestersof uh college and i was undecided so i was just taking general classes
Q4	no
Q5	**no**
Q6	**<deep breath>wow uh yeah i can't remember the last time i had an argument with someone i don't know**
Q7	ten or twenty years ago uh guess i would tell myself to stick with what what stick with what i love
Q8	**what am i most proud of like an event or an accomplishment**
Q9	uh xxx today when i talked when i uh talked to my friend earlier
Q10	**very easy**

Table 5: Results from paper [2]

Precision	Recall	F1	Accuracy
0.55	0.79	0.65	0.74

1. Use the consolidated text and create RoBERTa tokens
2. Use a Topic based attention
3. A final linear classifier

[2] A Topic-Attentive Transformer-based Model For Multimodal Depression Detection, (Guo et al, 2022) | Paper

Potential ideas to work on

- Extracting keywords from each of the PHQ_8 questions
- For each participant's transcripts using an algorithm like TF-IDF to find how similar words are to that keyword and rating from 0-3
- Feeding these values in addition to the transcript for classification

Question	Number of Subjects
Where are you from originally?	186
How are you doing today?	184
When was the last time you argued with someone and what was it about?	182
Tell me about the last time you felt happy	182
How are you at controlling your temper?	177
What advice would you give yourself 10 or 20 years ago?	177
What are you most proud of in your life?	174
How easy is it for you to get a good night's sleep?	173
Have you been diagnosed with depression?	167
How would your best friend describe you?	164
What did you study at school?	164
How have you been feeling lately?	161

Tentative Plan

Plan for next week

1. Work on creating text out of the 12 most asked questions and run it on Yuxin's and the anxiety detection models
2. Creating a customised stop word removal
3. Find related work implementing a similar idea for depression detection or other tasks.

Relevant Links

1. Overall project plan and timeline: Link
2. Analysis and notes from relevant papers: Link
3. GitHub documenting everyone's presentations and codes: Link

End