

Depression Detection

- Week 6

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Internship Period: Jan – July 2024

Undergraduate 4th year

Duration of the presentation: ~12 minutes

Agenda

- 1. Understanding Evaluation Metrics (TP, TN, FP, FN)**
- 2. Modifying stopwords removal**
 1. The method followed
 2. Comparing the text and results
- 3. Answer consolidation for frequent emotionally relevant questions**
- 4. Analysis of pronoun and absolutist words**
- 5. Tentative plan for next week**

Understanding Evaluation Metrics (TP, TN, FP, FN)

$$\text{precision} = \frac{TP}{TP + FP}$$

$$\text{recall} = \frac{TP}{TP + FN}$$

$$F1 = \frac{2 \times \text{precision} \times \text{recall}}{\text{precision} + \text{recall}}$$

$$\text{accuracy} = \frac{TP + TN}{TP + FN + TN + FP}$$

For ES:

TP = 19, TN = 27, FP = 6, FN = 14

Precision: $19/(19+6) = 0.76$

Recall: $19/(19+14) = 0.58$

Accuracy: $(19+27)/(19+27+6+14) = 0.70$

F1: $2 \times 0.76 \times 0.58 / (0.76 + 0.58) = 0.66$

	Y	Y'
TP	1	1
TN	0	0
FP	0	1
FN	1	0

Table 1: Describe the way metrics are calculated from Y actual and Y predicted

Table 2: The results of 2 most recent local runs

	Epoch	Precision	Recall	F1	Accuracy
Early stop ping	24	0.76	0.58	0.66	0.70
Dropout + ES	32	0.63/ 0.67	0.67/ 0.61	0.65/ 0.64	0.64/ 0.65

For Dropout + ES:

TP = 20, TN = 23, FP = 10, FN = 13

Modifying stopwords removal

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

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

Table 3: The results of running methodology [1] locally on DAIC-WOZ

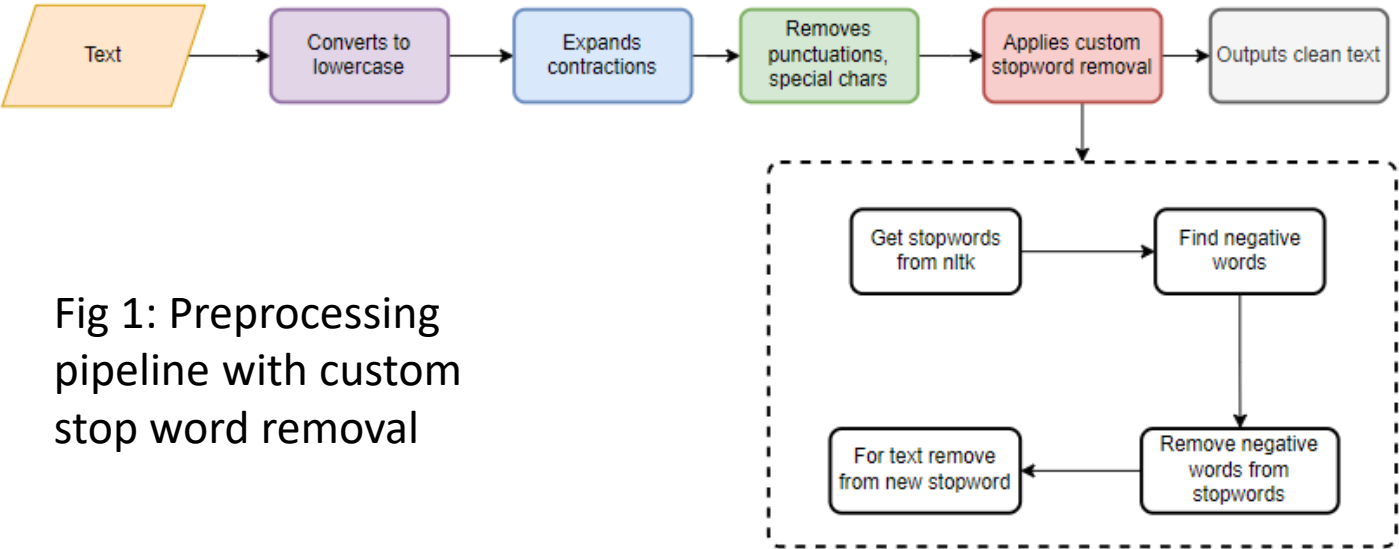


Fig 1: Preprocessing pipeline with custom stop word removal

Method	Precision	Recall	F1	AUC-ROC
Raw Text	0.59	0.51	0.60	0.65
No Stopwo rds	0.62	0.56	0.56	0.61
Preprocess ing	0.66	0.57	0.57	0.65

Answer consolidation for emotionally relevant questions

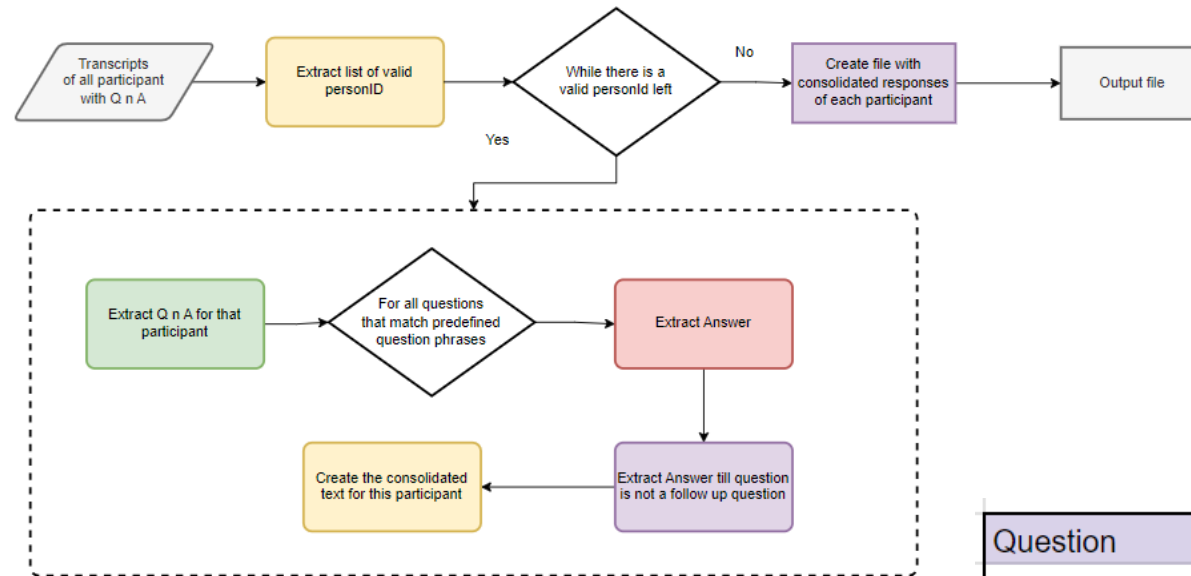


Fig 2: Figure displaying the methodology to consolidate text only for these questions for each participant

Table 4: Showing the emotionally relevant questions chosen for consolidation

Question	Number of Subjects
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
how easy is it for you to get a good night's sleep	173
have you been diagnosed with depression	167
How have you been feeling lately	161
Anything you regret	154
have you noticed any changes in your behaviour or thoughts lately	132

Answer consolidation for emotionally relevant questions

Table 5: Original Transcript example

personId	Question	Answer
300	How are you doing today	good
300	When was the last time you argued with someone	Probably 2 weeks ago
300	how did you feel then	frustrated
300	Tell me more	I don't like bias I don't like

personId	Consolidated response
300	Good Probably 2 weeks ago Frustrated I don't like bias I don't like

Table 6: Example after consolidating based on question

Potential Drawbacks

1. Considered only common Questions and follow up phrases (yeah, mhm, tell me more). Might miss out on important information for few participants
2. The use of some follow up phrases might include irrelevant information for some participants

Analysis of pronoun and absolutist words

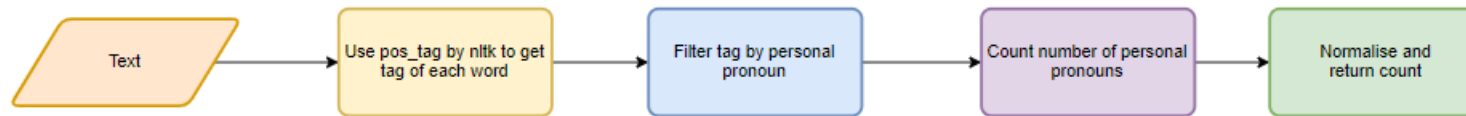


Fig 3&4: Steps to analyse word usage in complete and consolidated text

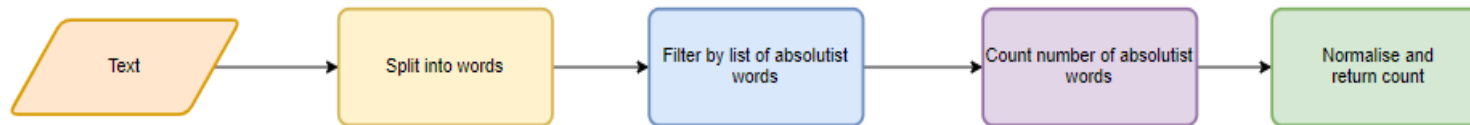


Table 7: Analysing word usage in shortened text DAIC-WOZ

	Pronoun usage	Absolutist word usage
Depressed	20.55	7.52
Non Depressed	19.17	6.31

Table 8: Analysing word usage in complete text DAIC-WOZ

	Pronoun usage	Absolutist word usage
Depressed	29.36	9.27
Non Depressed	27.00	8.54

Absolutist Words	
1	absolutely
2	all
3	always
4	complete
5	completely
6	constant
7	constantly
8	definitely
9	entire
10	ever
11	every
12	everyone
13	everything
14	full
15	must
16	never
17	nothing
18	totally
19	whole

[2] In an Absolute State: Elevated Use of Absolutist Words Is a Marker Specific to Anxiety, Depression, and Suicidal Ideation (Al-Mosaiwi et al, 2018)| [Paper](#)

Tentative Plan

Plan for next week

1. Modify the anxiety detection code to display the micro-average metrics
2. Use the smaller dataset consisting of just the emotionally relevant answers and run on Yuxin's and the anxiety detection models.
3. Try working on consolidating the literature.

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

