Sentiment Analysis

CONVERSATIONAL AGENTS AND NATURAL LANGUAGE PROCESSING

Meet The Team

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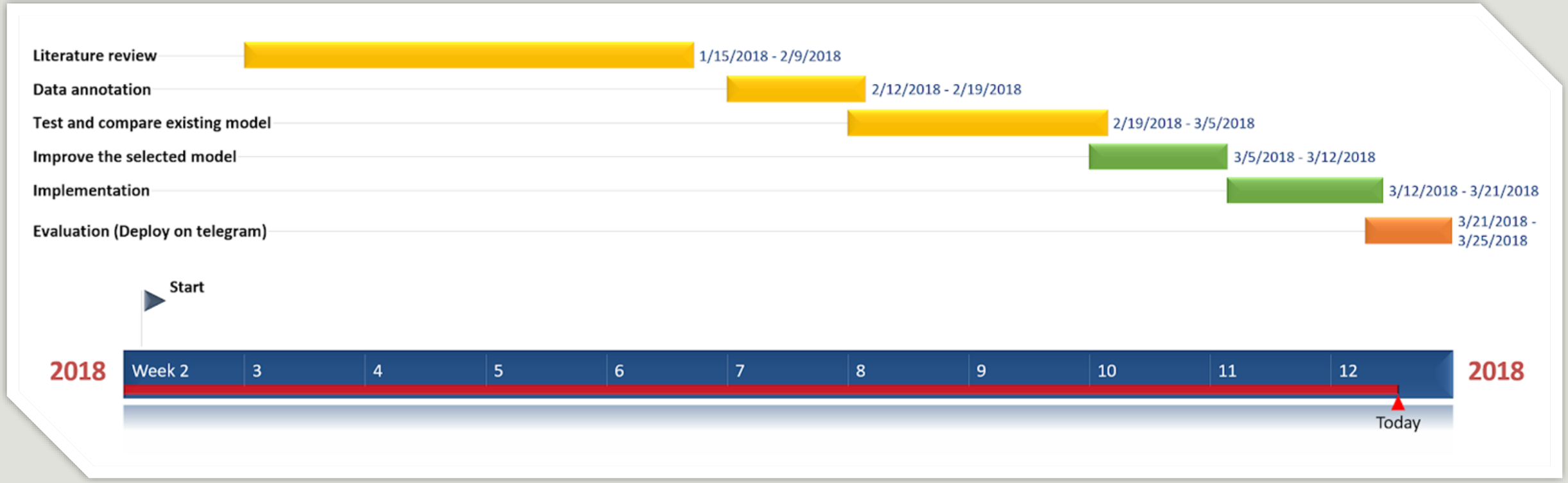
Aims & objectives

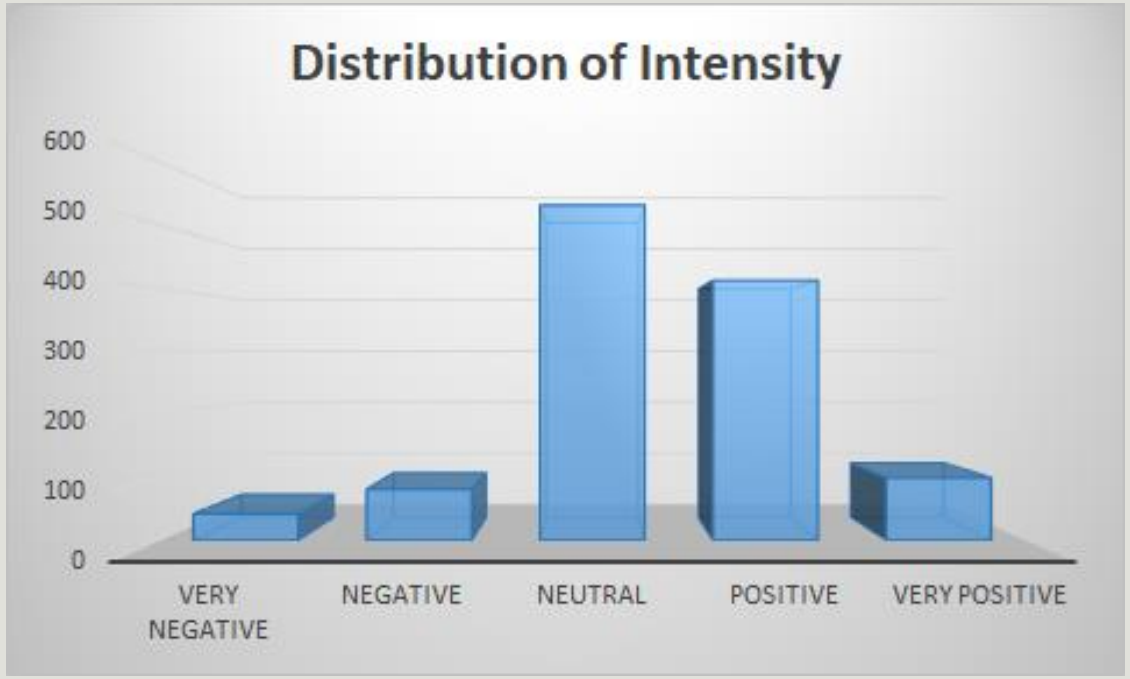
- Understand Natural Language Processing
  - Review the most recent literatures
  - Test existing models
  - Test Vanilla Alana

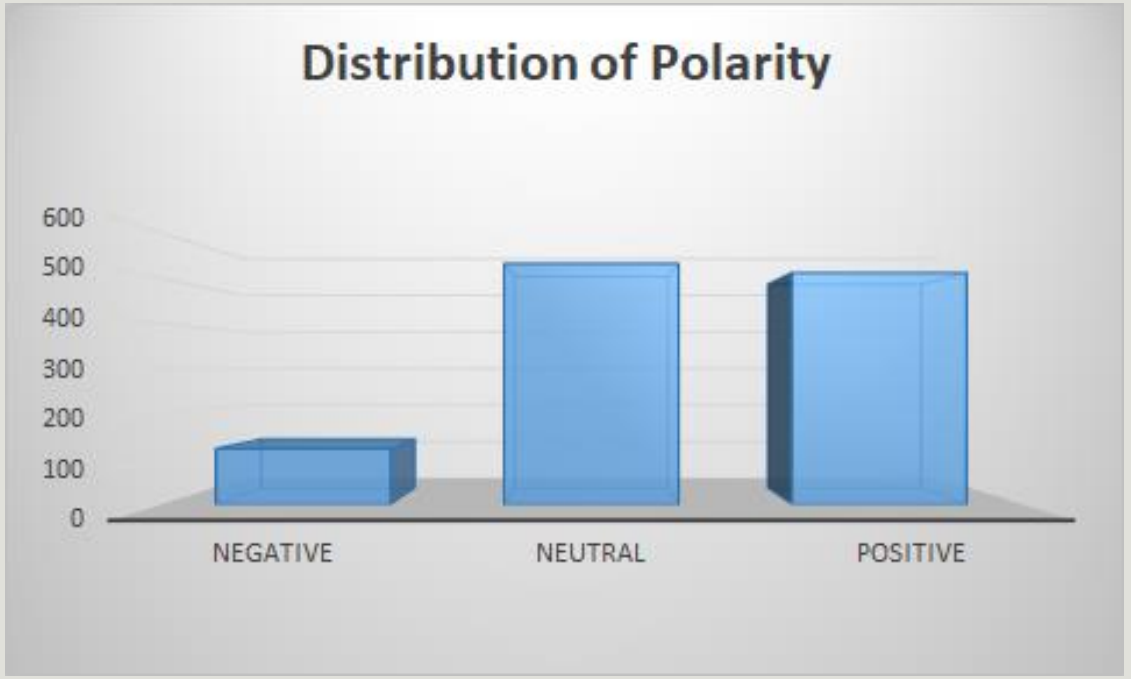
- Make Alana understand sentiments and feelings
  - Create and annotate alana data
  - Train our data and choose the most suitable model
  - Implement our model into alana system
  - Evaluate and compare

Timeline & Methodologies

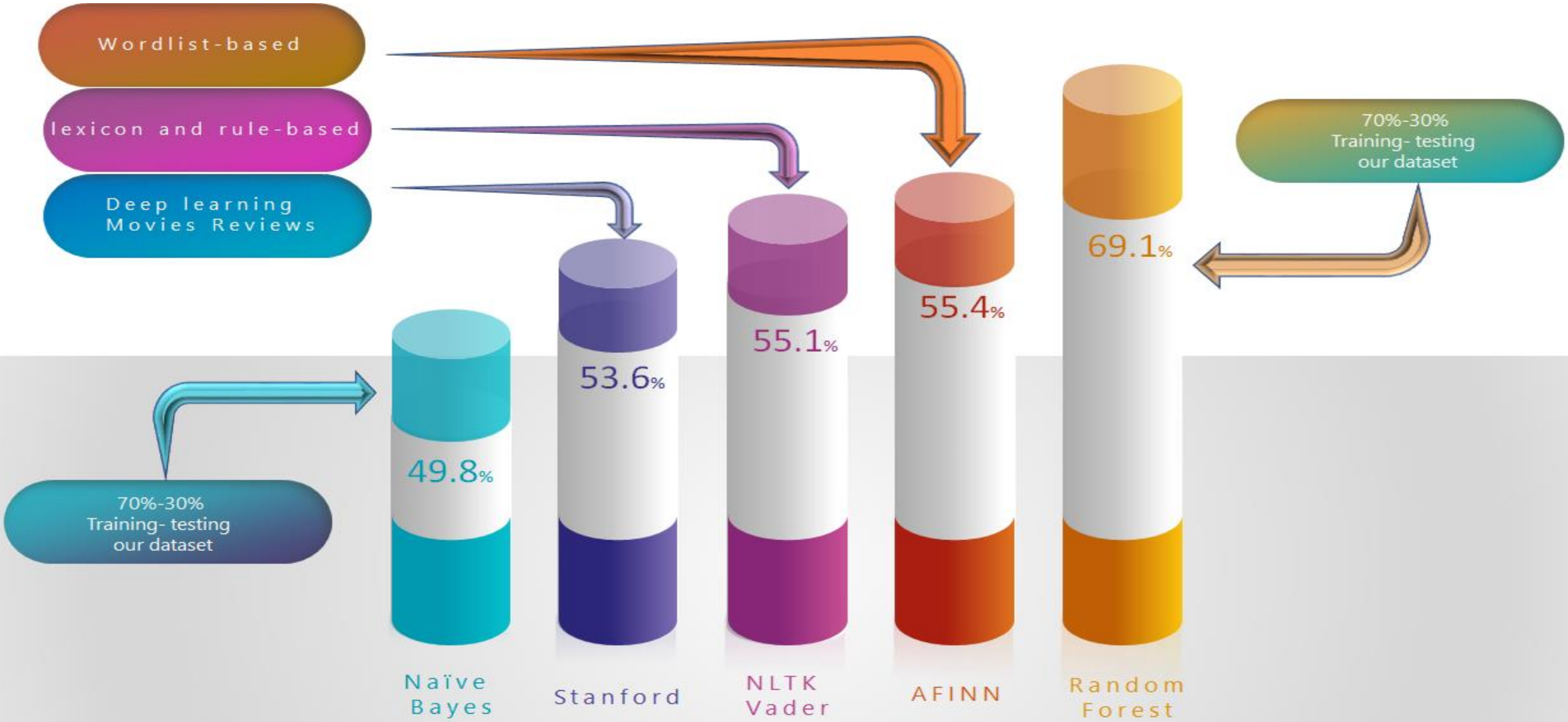


Dataset & Annotation

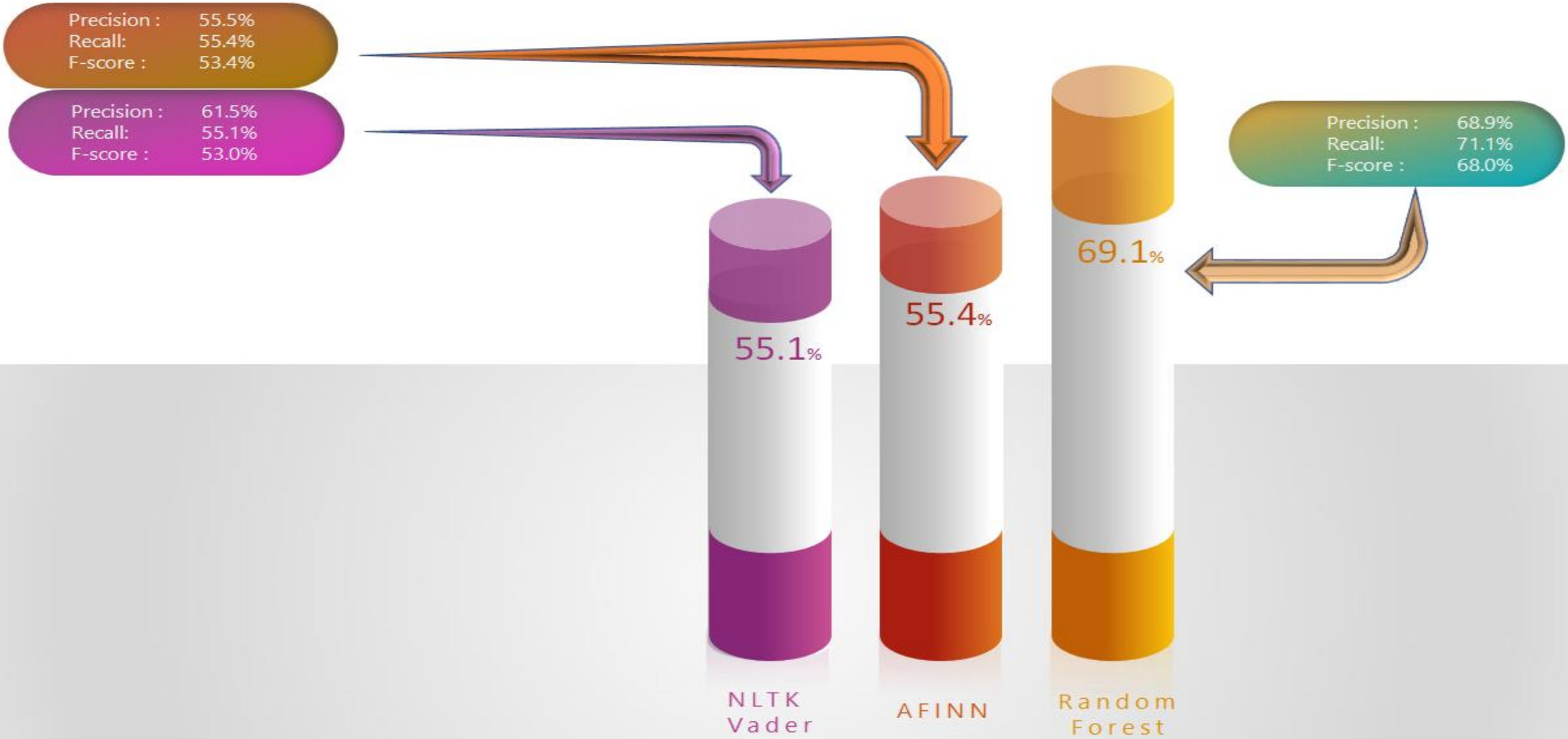




Testing Existing Systems



Testing Existing Systems



Experiments with Random Forest Model

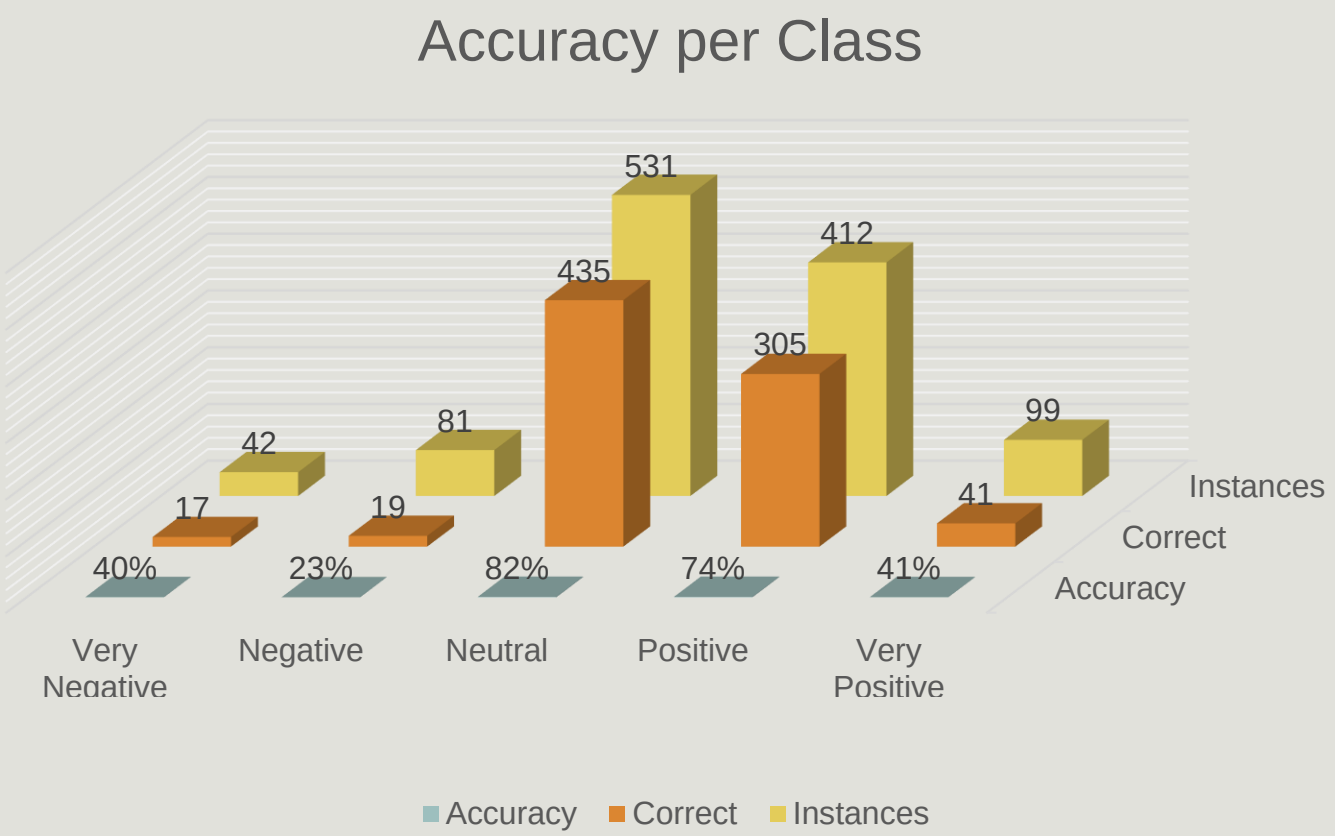
69.1%
25 trees
Our dataset

70.2%
2000 trees
Our dataset

49.5%
100 trees
Train on
twitter dataset
Test on
our dataset

71.1%
25 trees
Our dataset
+
Vader dataset

Annotated Dataset



Alana Implementation

1st attempt : Implementation in Persona

- Improve Persona's sentiment detection using our model
- 1 to 1 replacement not ideal

Final implementation : In the Bucket

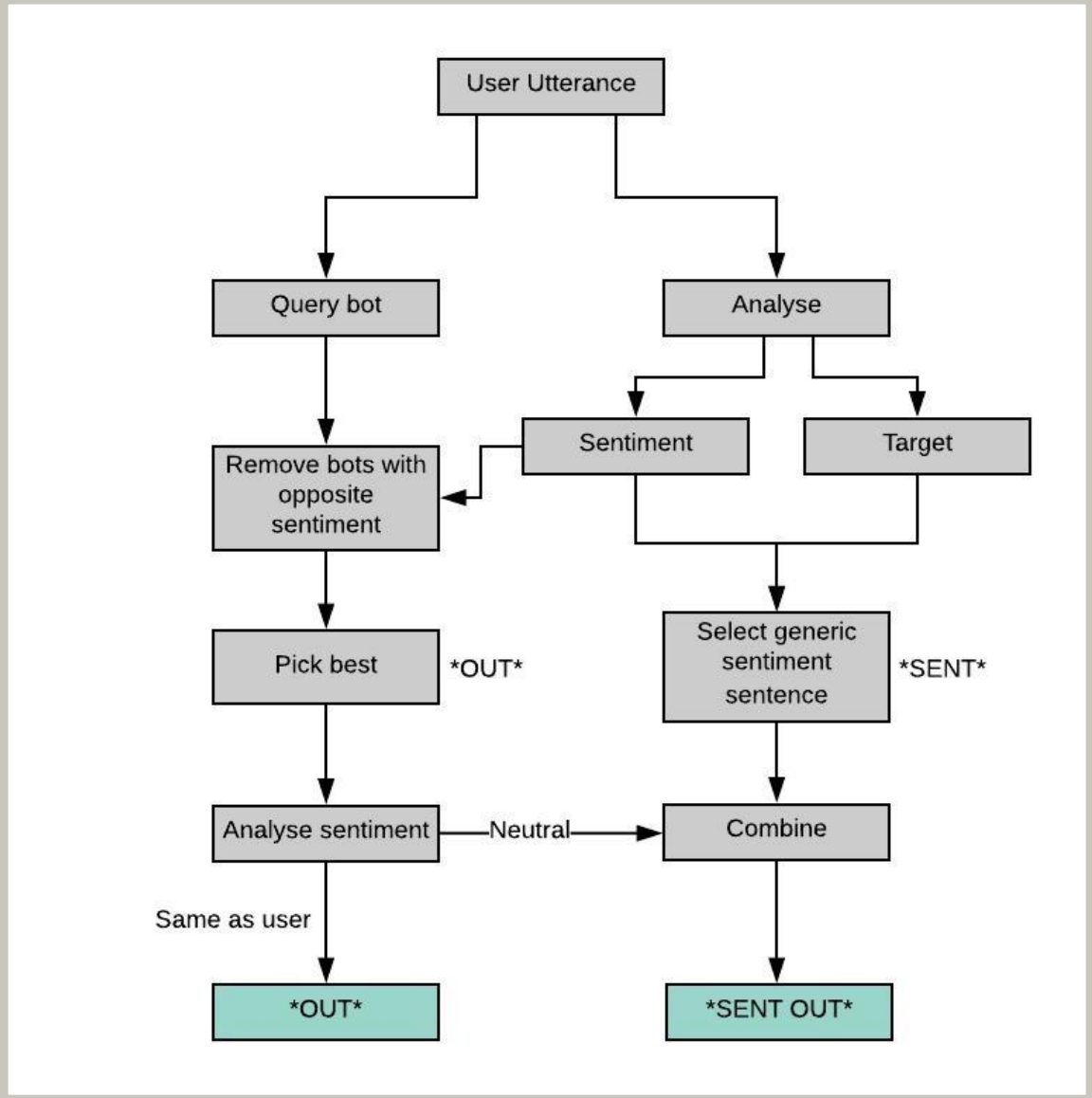
1) Pre-fix the system output with a generic sentiment filled sentence

2) Prevent bots with opposite sentiment from being selected

3) Detection of user sentiment's target (Alana vs other)

4) If output is already sentiment filled, do not add pre-fix

Alana Implementation



User Evaluation

Telegram Systems

@Susan_sent_bot - Alana with no modifications

@Rob_sent_bot - Alana with added sentiment model

- Use bot
- Get Chat ID using command /id
- Fill out survey

Telegram Instructions

Chat-bot Feedback. Alana Review

Please try our new chat bot (Feedback is required for us to complete the evaluation)

Finally the chat bot is deployed
Things to do to try it out
1. Download Telegram
2. on the top left corner there will be a search bar search for:
@Susan_sent_bot
@rob_sent_bot
3. Start the conversation and boom!!!
4. During the conversation please try to tell both bots that you are sad or happy etc. and check whether they understand your feeling.
5. after you finish your conversation type /id to get your user id
6. please go the link below and fill out the form with your id

https://docs.google.com/forms/d/e/1FAIpQLSekDAwDaAlSKtoaQap7JnYV587gYrWta-CNB5wXM36cun-4Cw/viewform

I hope you all enjoy it

Contributors

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Google Survey

Chat-bot Feedback. Alana Review

Use the command "/id" in telegram bots if you are not sure what your ID

What is your ID for conversation with Rob?

Your answer

What is your ID for conversation with Susan?

Your answer

Did Rob understand your feeling?

- Yes
- No

Did Susan understand your feeling?

- Yes
- No

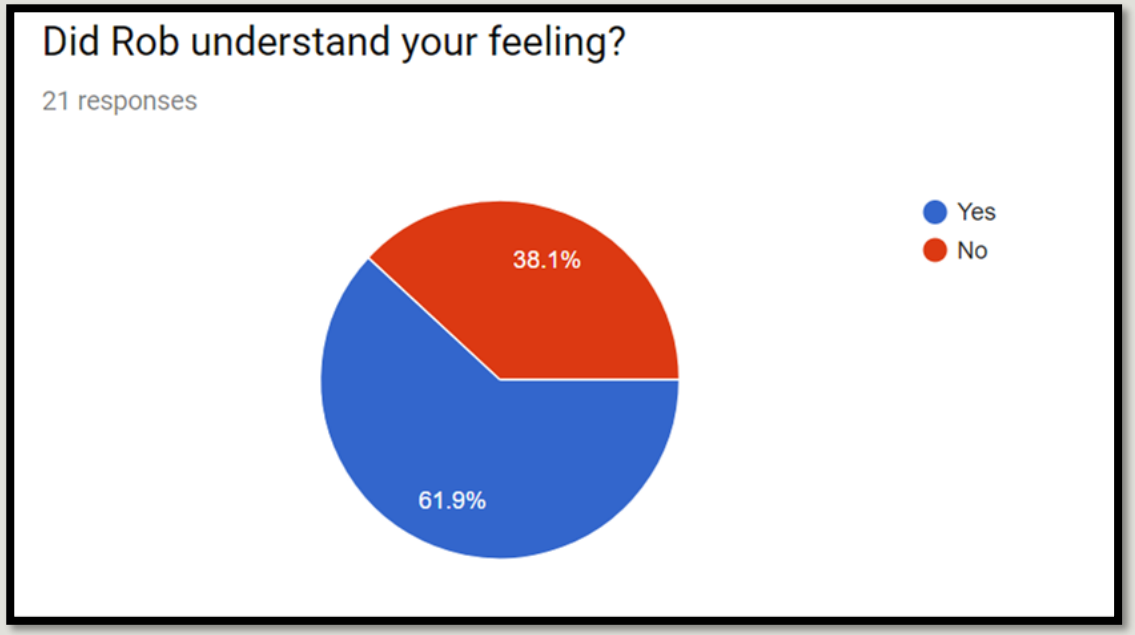
What rating will you give your conversation with Rob

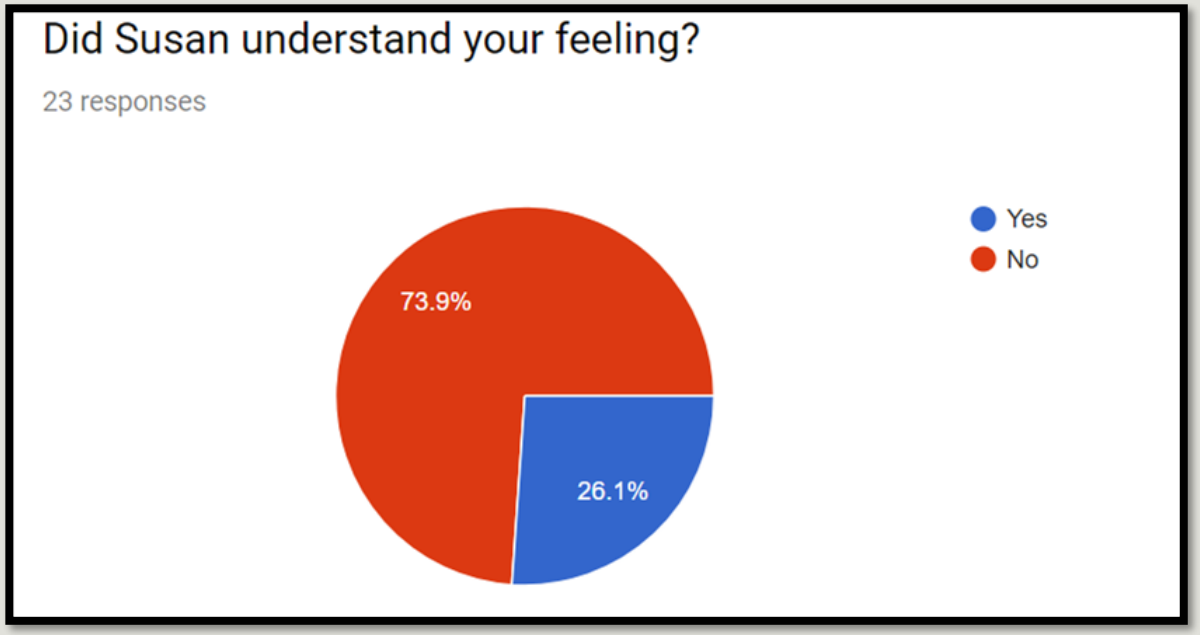
	0	1	2	3	4	5	
very poor							very good

What rating will you give your conversation with Susan

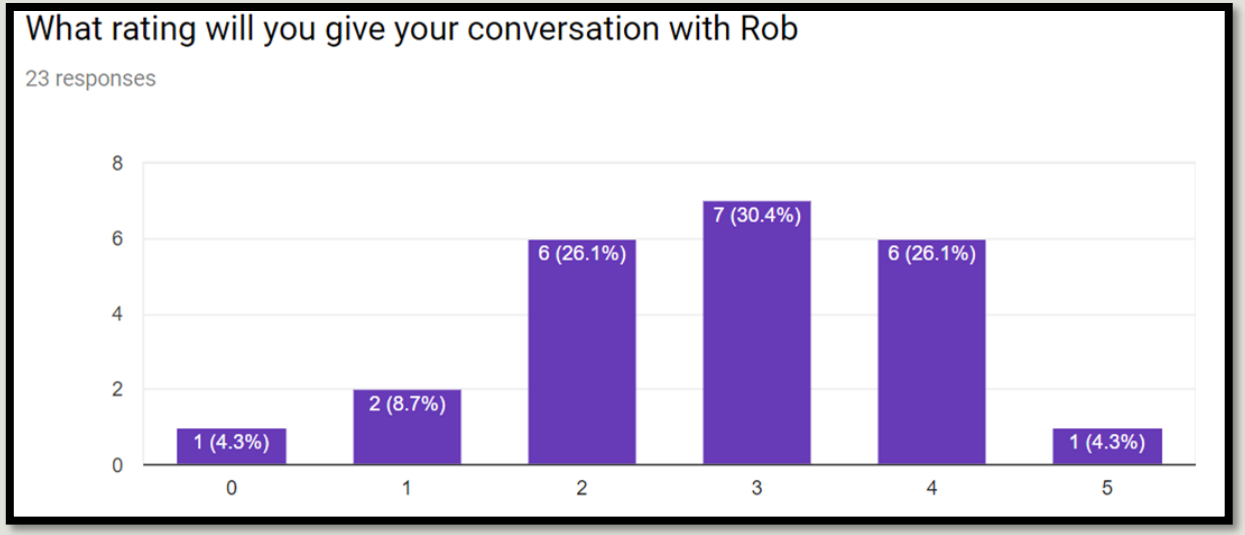
	0	1	2	3	4	5	
very poor							very good

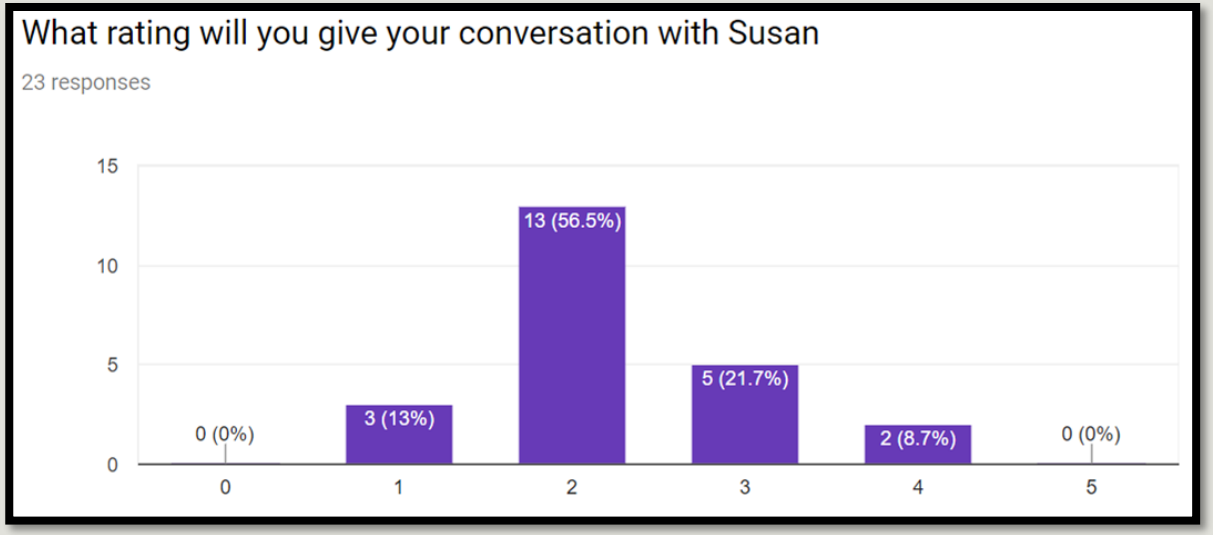
User Evaluation





User Evaluation



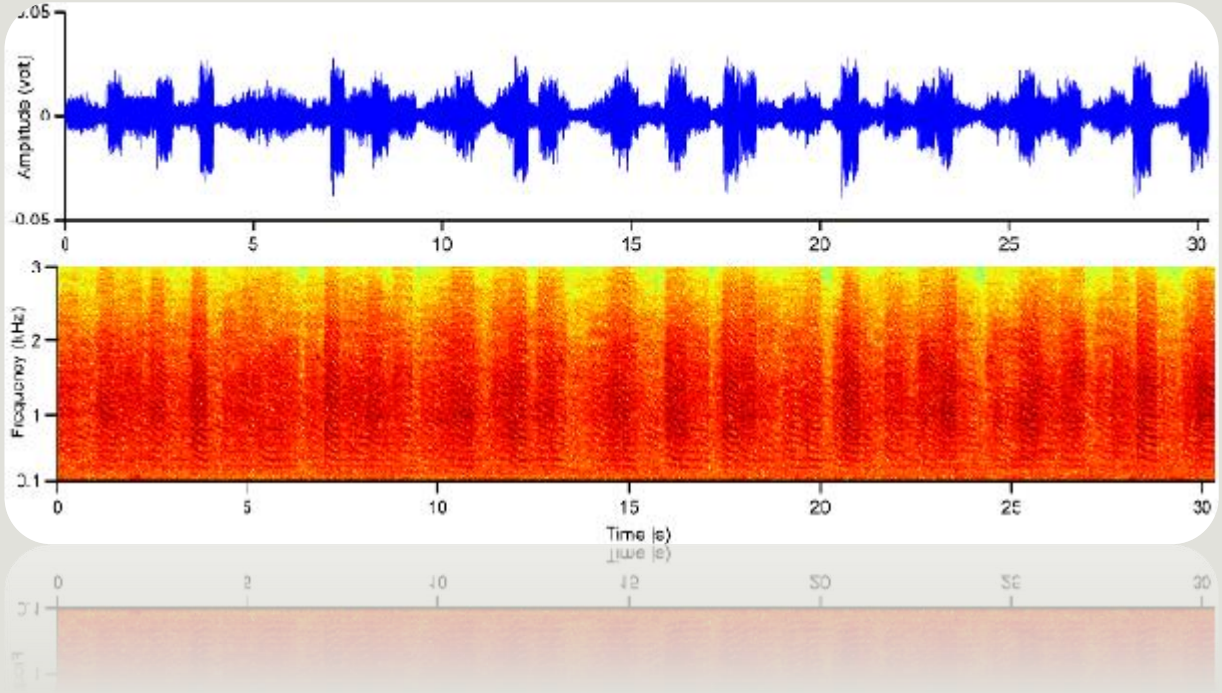


Conclusion

- **Annotated 1164 utterances**
- Custom annotated dataset with Vader Dataset gave best results
- Append sentiment to the start of the sentence
- Match Rob's output with sentiment from user utterance
- Evaluation: **22 responses** in total (Rob is better than Susan)
  - Evaluation still in progress

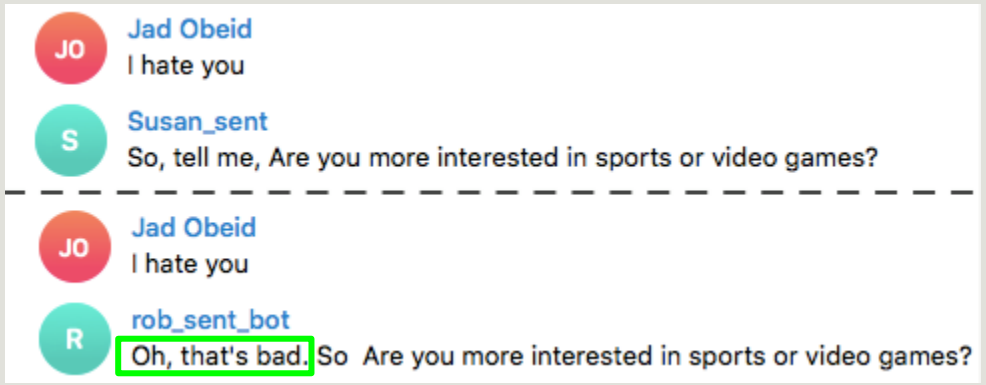
Future Work

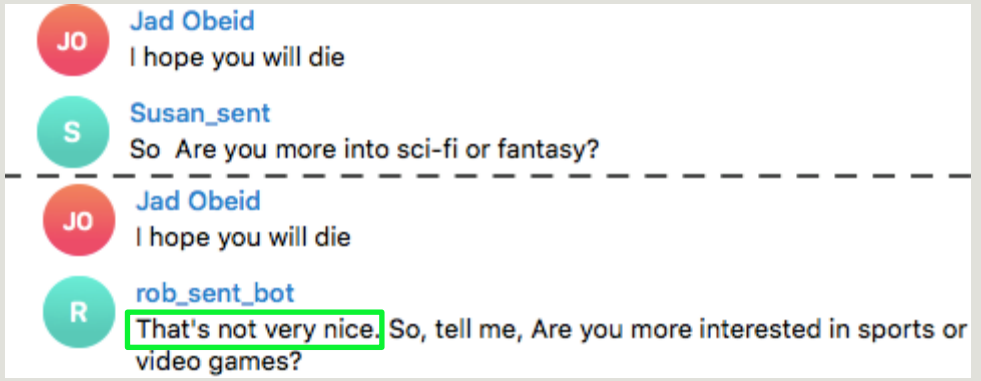
- Spectrogram (spectrum of frequencies) of user utterances
- Train a classifier with sound wave using TYUT speech database (Ying and Xue-Ying, 2018)
- Conversation agent that can understand and interact with user. (Breazeal and Brian, 1999)

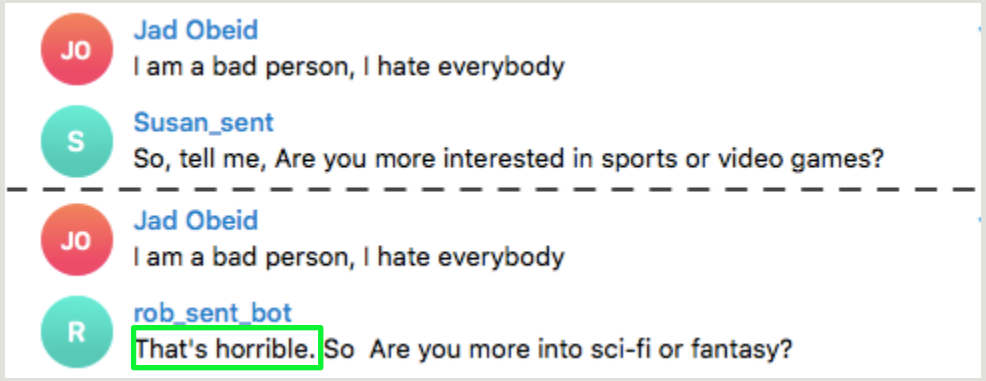


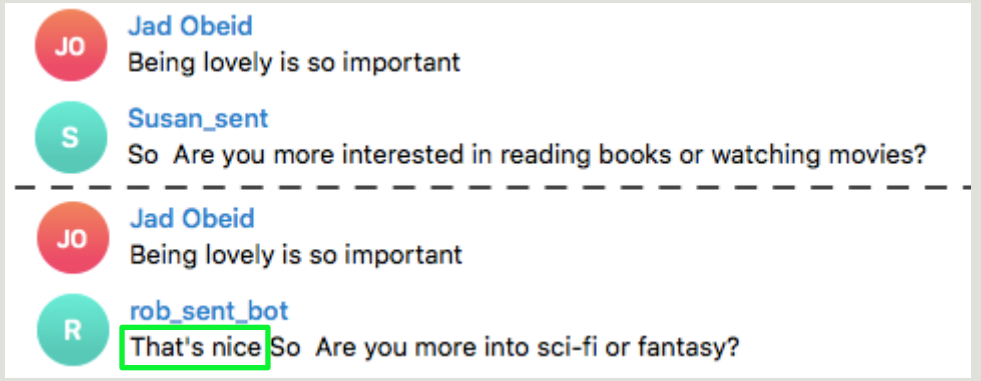
Thank you for Listening !

Susan and Rob outputs



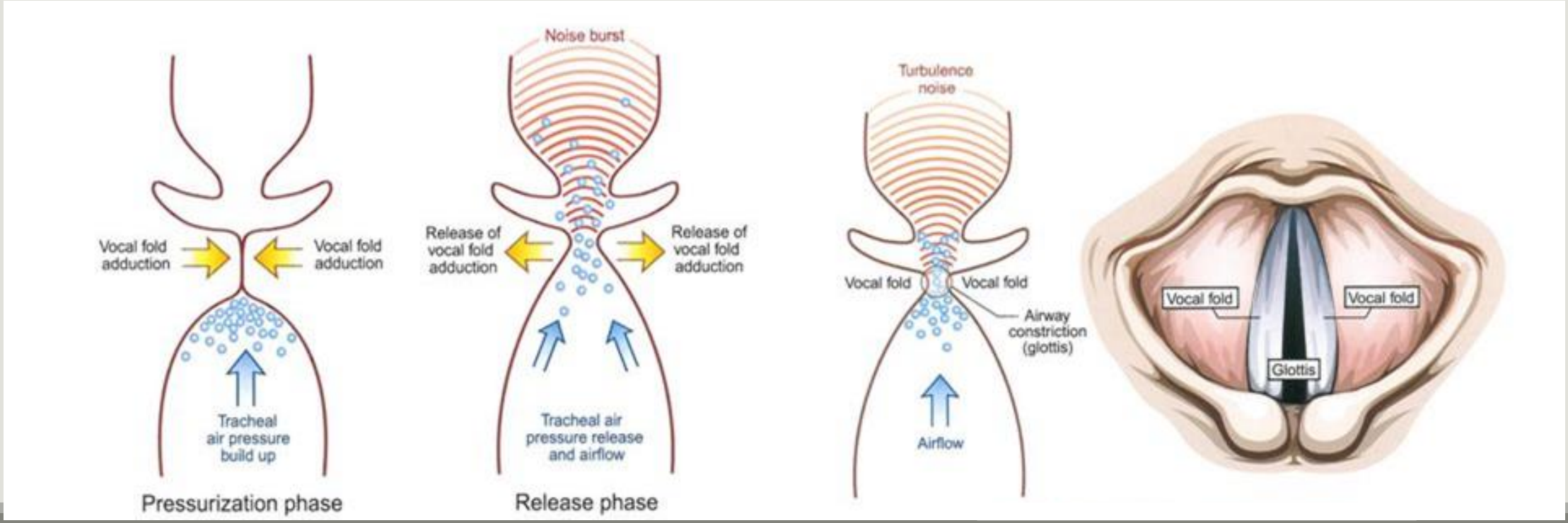






Future Work

- Glottis features in voice generation



Research Question

1. Applicability of common sentiment analysis models to open domain human robot interaction.
2. How can sentiment analysis improve user experience?