Emotion Detection : Multiclass Text Classification

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Background Summary

Why emotion detection?

- Big step in human-computer interaction.
- In customer management
- Psychologists benefit
- Predict consumer Behavior.

Easily doable?

Most of the work done Using

- Facial Expression
- Speech

Not So Much Using Text.

What to do?

- 90% of Social Site and blog post data Are in TEXT!
- Huge Mining Field!

Solution!

Let's do this Using text classification!

Problem Objective

1 IDEA

Emotion detection from text :
Supervised Classification

1. Anger
2. Fear
3. Joy
4. Disgust
5. Sadness
6. Shame
7. guilt

2 ANALYSIS

Classification Technique-
Naïve Bayes/ SVM/ Decision Tree/NN?
Bi-class or Multiclass?

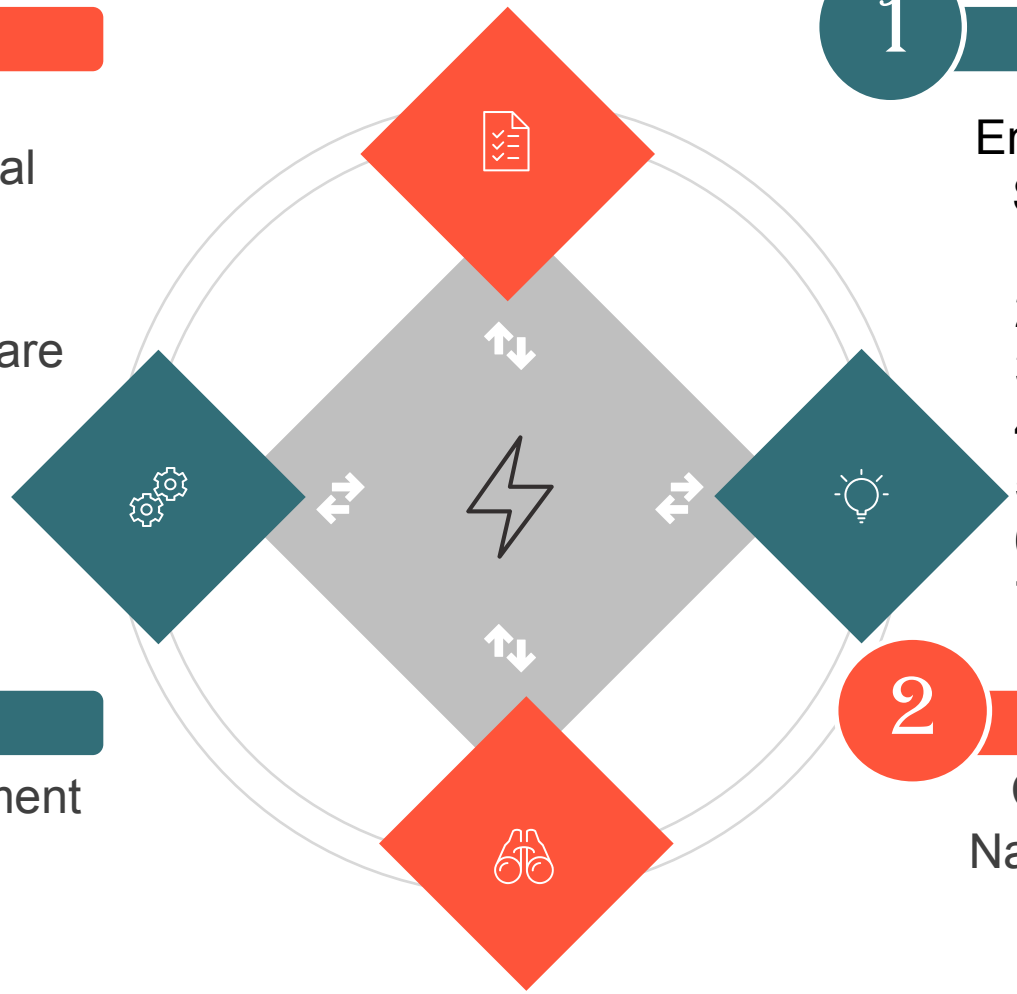
3 REALIZATION

Emotional Analysis vs Sentiment Analysis
NN vs Others
LSTM model vs BPNN

4 PLAN

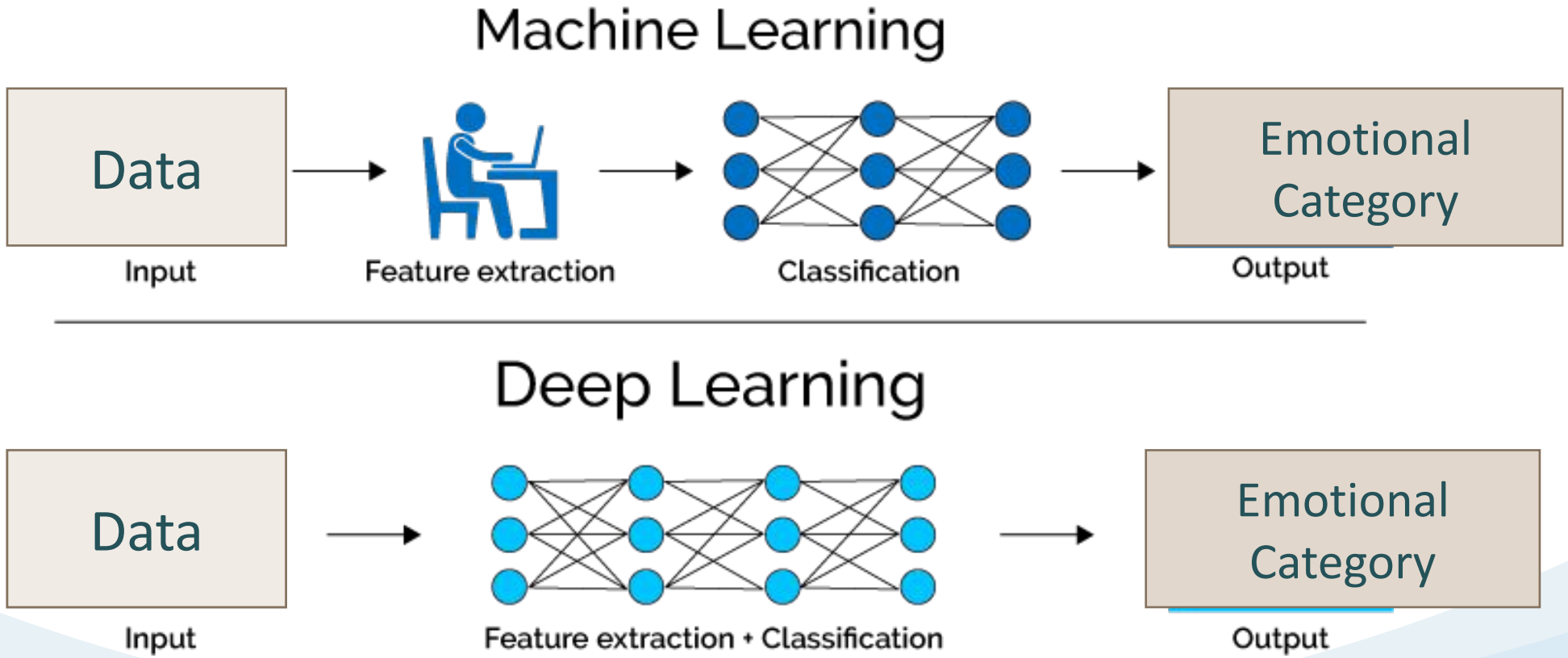
Will use LSTM of RNN
And do Multiclass Emotional Analysis!

Use other methods to compare performance



Problem Objective

Why deep learning?



Literature Review

Text-Based Intelligent Learning Emotion System

By- Mohammed Abdel Razek & Claude Frasson3

Used The ISEAR dataset (7666 data)
Performs better then previous

A Knowledge Base for Emotion Detection Based on the Appraisal Theory

By Balahur, A., Hermida, J.M. and Montoyo, A. (2011) Building and Exploiting Emotinet,

Used The ISEAR dataset (7666 data)
Performs better then previous

Methodology




Data Collection	Preprocessing	Main Processing	Testing
Collect Data	Tokenization, Word Embedding	Build Model	Test data : 0.05% of original data
Label Data	Stemming	Train Model	Print Confusion matrix
Remove Noise	StopWords Removal	Use Validation	Measure Accuracy, f1 score, Recall, Precision

Data and Sample

Train Data

6866

Emotional Responses

Anger----1096
Fear -----1095
Disgust----1096
Guilt----1093
Joy----1094
Sadness----1096
Shame----1096

Test Data

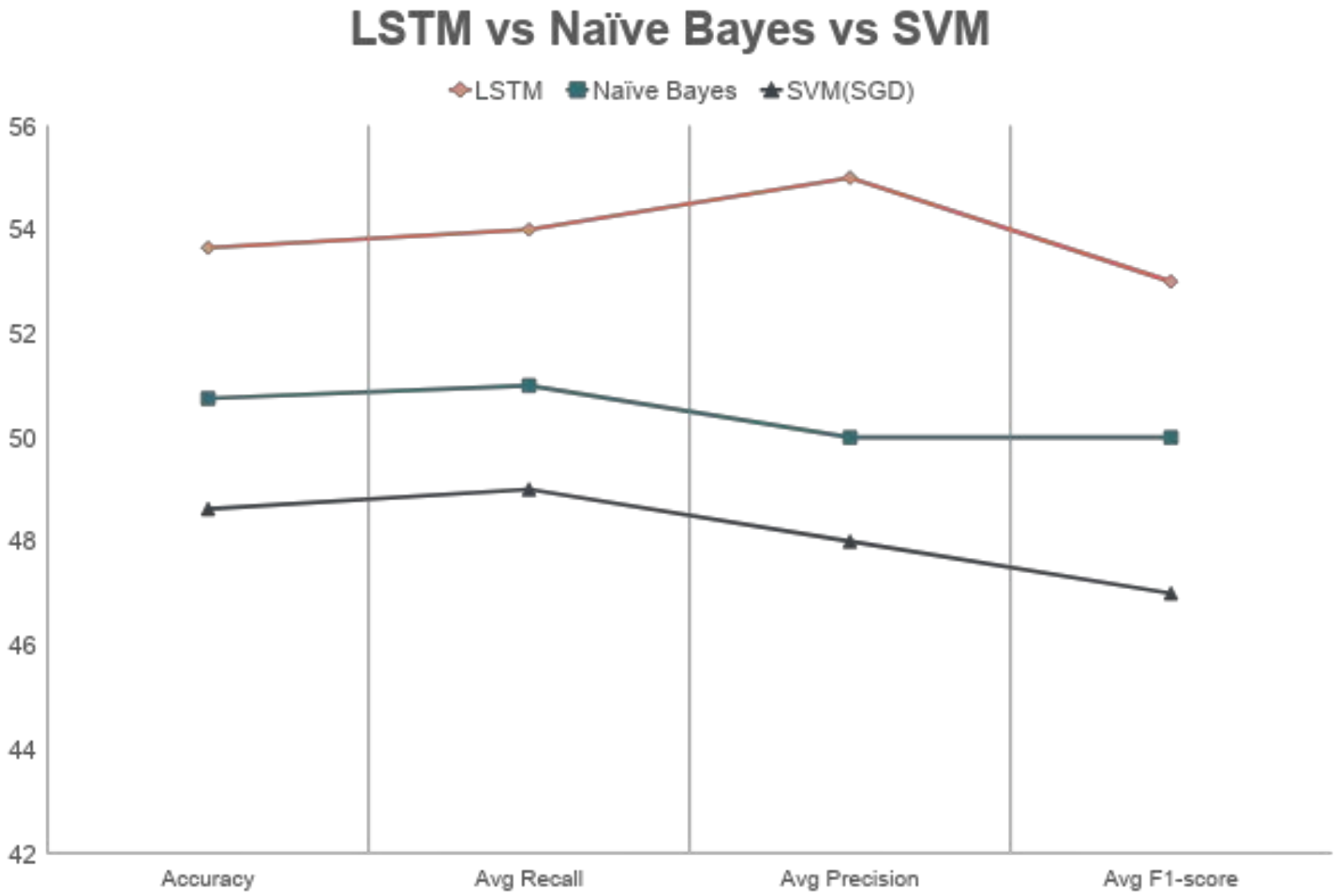
800

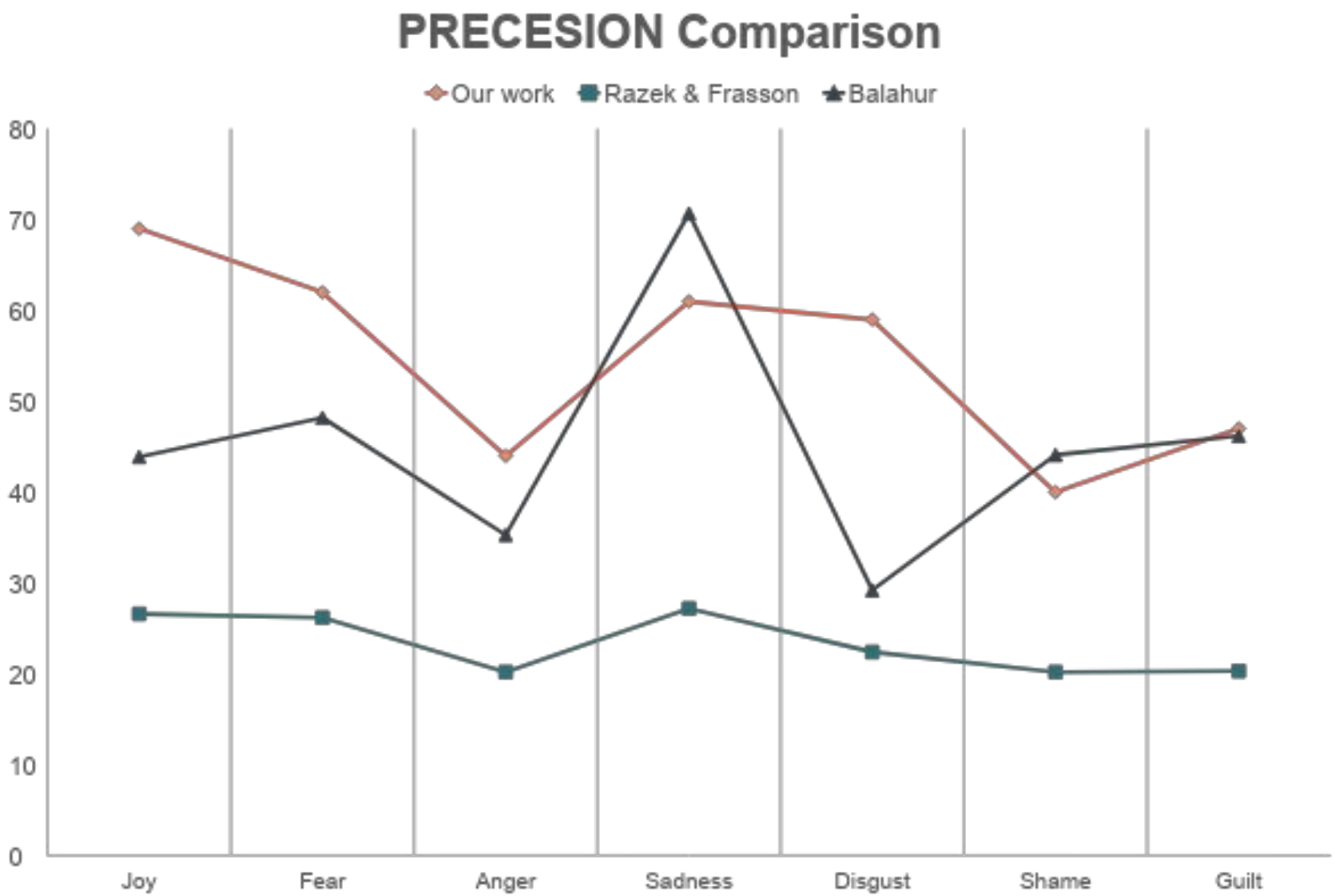
Of the original dataset

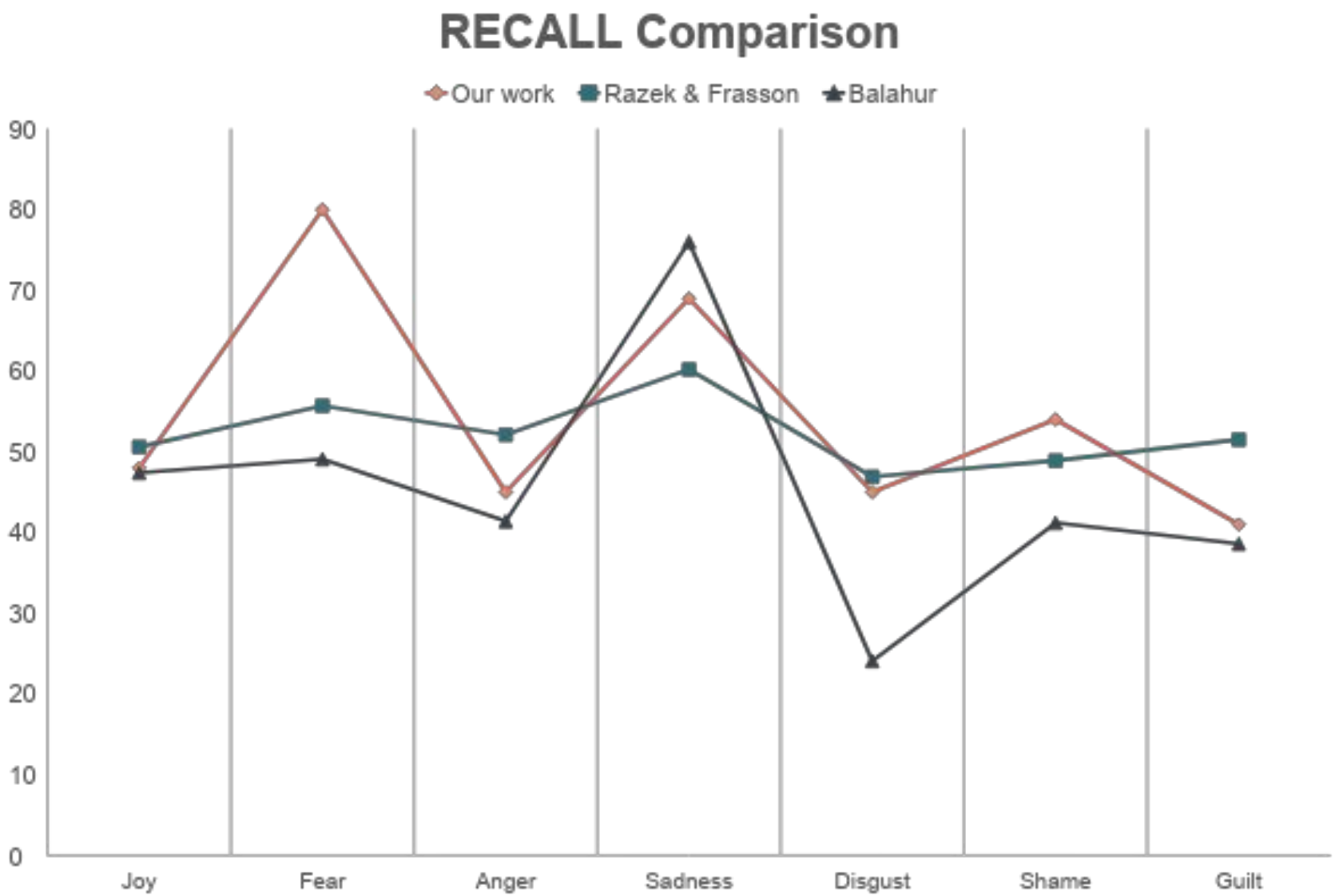
Accuracy: 53.64%
Recall : 55%
Precision : 56%
F1-score : 55%

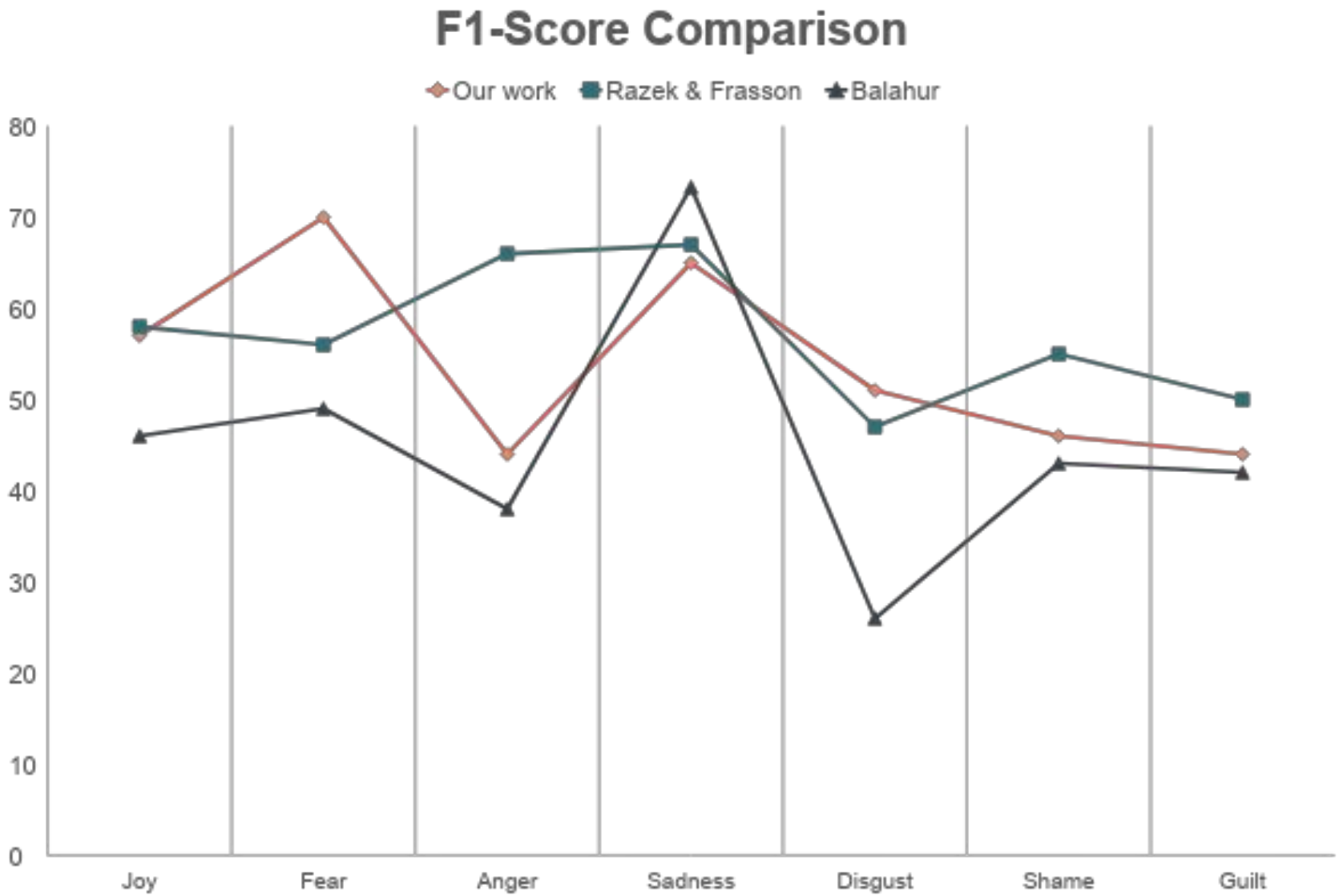
On Bengali Dataset

Data : 2474 samples from Facebook
On 6 basic emotion class
Accuracy: 55.64%


LSTM vs Naïve Bayes vs SVM
LSTM
Naïve Bayes
SVM(SGD)
56
54
52
50
48
46
44
42
Accuracy
Avg Recall
Avg Precision
Avg F1-score


PRECESION Comparison
Our work
Razek & Frasson
Balahur
80
70
60
50
40
30
20
10
0
Joy
Fear
Anger
Sadness
Disgust
Shame
Guilt


RECALL Comparison
Our work
Razek & Frasson
Balahur
90
80
70
60
50
40
30
20
10
0
Joy
Fear
Anger
Sadness
Disgust
Shame
Guilt


F1-Score Comparison
Our work
Razek & Frasson
Balahur
80
70
60
50
40
30
20
10
0
Joy
Fear
Anger
Sadness
Disgust
Shame
Guilt

Conclusion

Much Better findings in RNN (LSTM)
And it works better without stemming and removing stopwords.

Future Work

Complete the work on Emotion detection on Bengali Language
Submit for Publication In journal and conference.


THANK
YOU