

SDC1034 – Natural Language Processing Naan Mudhalvan



Emotion Detection using TeleBot

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Emotion Detection from Telegram Text using ML

PROBLEM STATEMENT AND SOLUTION

Understanding emotions from text is essential for improving user interaction and feedback systems. Traditional sentiment analysis lacks the granularity to detect specific emotions like joy, anger, or fear.

This project develops a machine learning pipeline for accurate emotion classification from textual input. A Telegram bot is integrated as the user interface for real-time emotion prediction and response.

AIM

To develop a ML-based system that accurately detects and classifies human emotions from textual input, and deploy it through a Telegram bot for real-time user interaction.

Objective:

- Detect emotions from user-provided text using ML models.

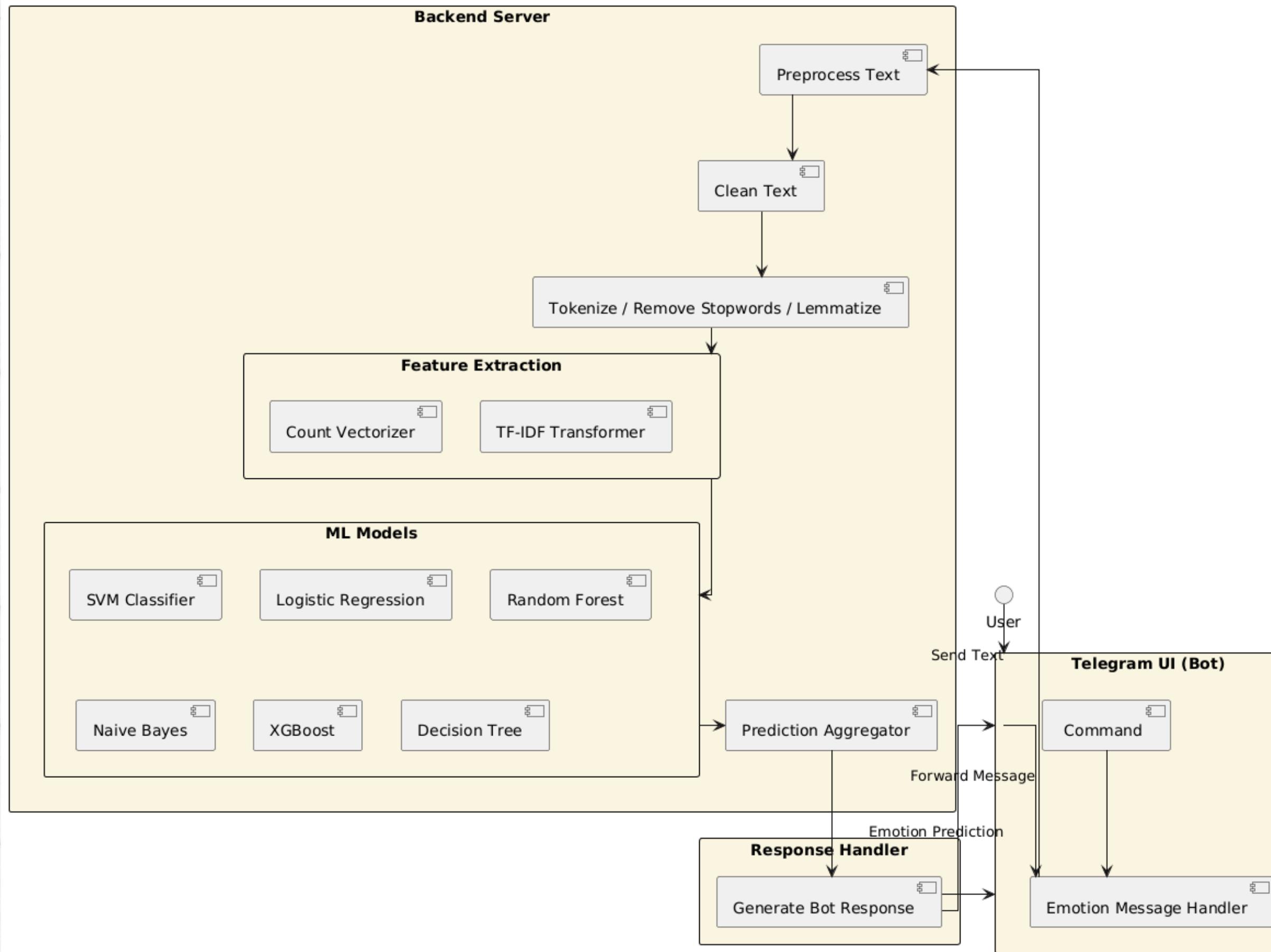
UI Implementation:

- Telegram bot used as the interface for real-time emotion prediction.

Key Features:

- Multiple ML models for comparison.
- Real-time input processing with pre-trained models.

Emotion Detection from Text - Architecture Diagram



Dataset

- Dataset: `text_emotions.csv`
- Source: [kaggle.com](https://www.kaggle.com/c/text-emotion-detection)
- Size: 20,000 rows, 2 columns:
 - content: raw text input
 - sentiment: target labels (anger, fear, joy, love, sadness, surprise)
- Distribution Visualization:
 - Class distribution plot using Seaborn (`sns.countplot`)

Text Preprocessing

Steps Performed:

- Remove Punctuations & Emojis
- Tokenization – Splitting sentences into words
- Stopword Removal – Filtering out common non-informative words
- Lemmatization – Reducing words to their root form

Text Preprocessing

content	Tweet_punct	Tweet_tokenized	Tweet_nonstop	Tweet_lemmatized
i didn't feel humiliated	i didnt feel humiliated	[i, didnt, feel, humiliated]	[humiliated]	[humiliate]
i can go from feeling so hopeless to so damned...	i can go from feeling so hopeless to so damned...	[i, can, go, from, feeling, so, hopeless, to, ...]	[go, feeling, hopeless, damned, hopeful, aroun...]	[go, feel, hopeless, damn, hopeful, around, so...]
i'm grabbing a minute to post i feel greedy wrong	im grabbing a minute to post i feel greedy wrong	[im, grabbing, a, minute, to, post, i, feel, g...]	[grabbing, minute, post, greedy, wrong]	[grab, minute, post, greedy, wrong]
i am ever feeling nostalgic about the firepla...	i am ever feeling nostalgic about the firepla...	[i, am, ever, feeling, nostalgic, about, the, ...]	[ever, feeling, nostalgic, fireplace, know, st...]	[ever, feel, nostalgic, fireplace, know, still...]
i am feeling grouchy!	i am feeling grouchy	[i, am, feeling, grouchy]	[feeling, grouchy]	[feel, grouchy]
i've been feeling a little burdened lately was...	ive been feeling a little burdened lately wasn...	[ive, been, feeling, a, little, burdened, late...]	[feeling, little, burdened, lately, wasnt, sure]	[feel, little, burden, lately, wasnt, sure]
i've been taking or milligrams or times recomm...	ive been taking or milligrams or times recomme...	[ive, been, taking, or, milligrams, or, times,...]	[taking, milligrams, times, recommended, amoun...]	[take, milligrams, time, recommend, amount, fa...]
i feel as confused about life as a teenager or...	i feel as confused about life as a teenager or...	[i, feel, as, confused, about, life, as, a, te...	[confused, life, teenager, jaded]	[confuse, life, teenager, jade]
i have been with petronas for years i feel tha...	i have been with petronas for years i feel tha...	[i, have, been, with, petronas, for, years, i,...]	[petronas, years, petronas, performed, well, m...]	[petronas, years, petronas, perform, well, mak...]
i feel romantic too	i feel romantic too	[i, feel, romantic, too]	[romantic]	[romantic]

Feature Extraction



Techniques Used:

- Count Vectorizer: Converts text to word frequency vectors
- TF-IDF: Weights terms by importance

Implementation:

- Trained TF-IDF on training data and applied to test data

Train-Test Split

- Split Ratio: 70% train – 30% test
- Vectorization: CountVectorizer + TF-IDFTransformer
- Input to models: TF-IDF features
- Target: Encoded sentiment labels

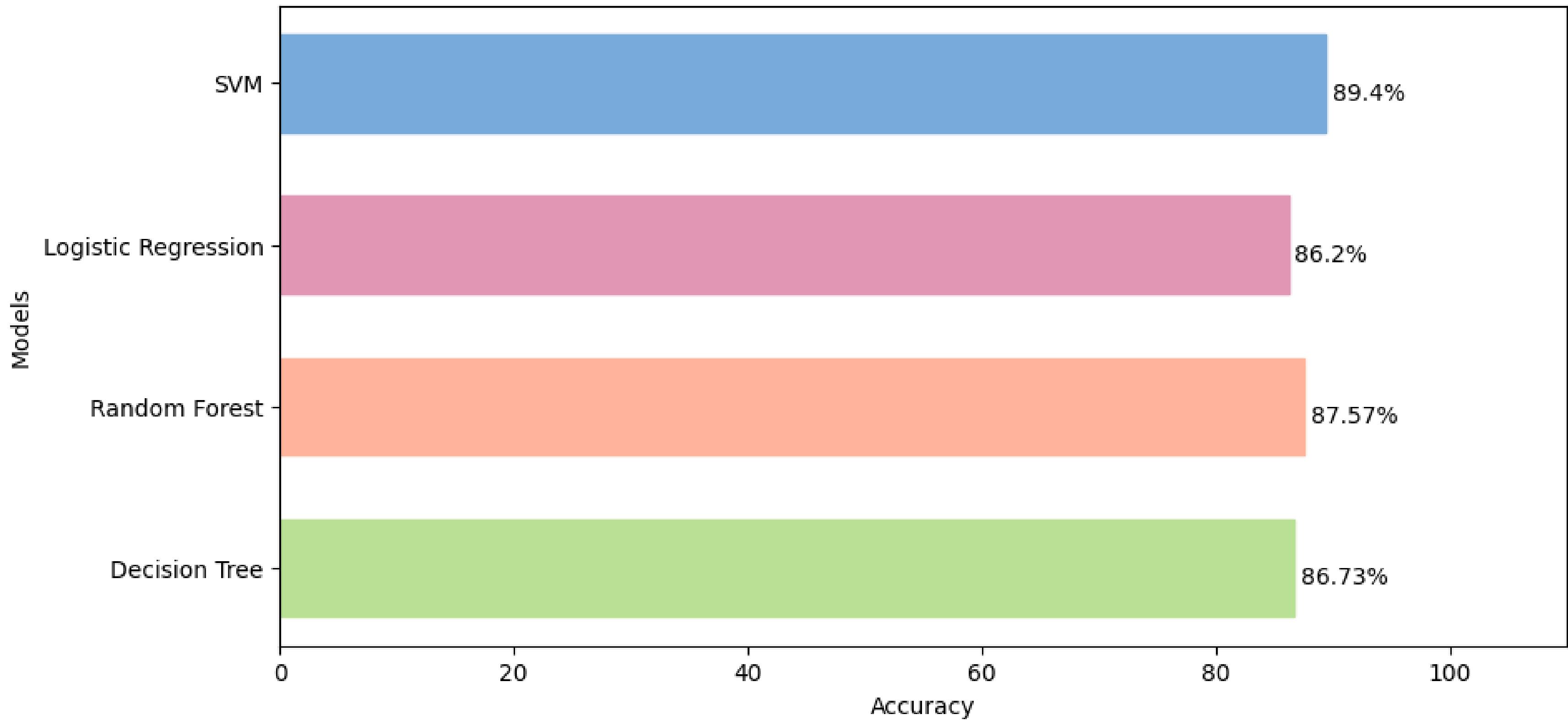
Model Selection & Training

Classifiers Evaluated:

- Support Vector Machine (SVM)
- Logistic Regression
- Random Forest Classifier
- Decision Tree Classifier

Model Evaluation

Accuracy for 4 Models

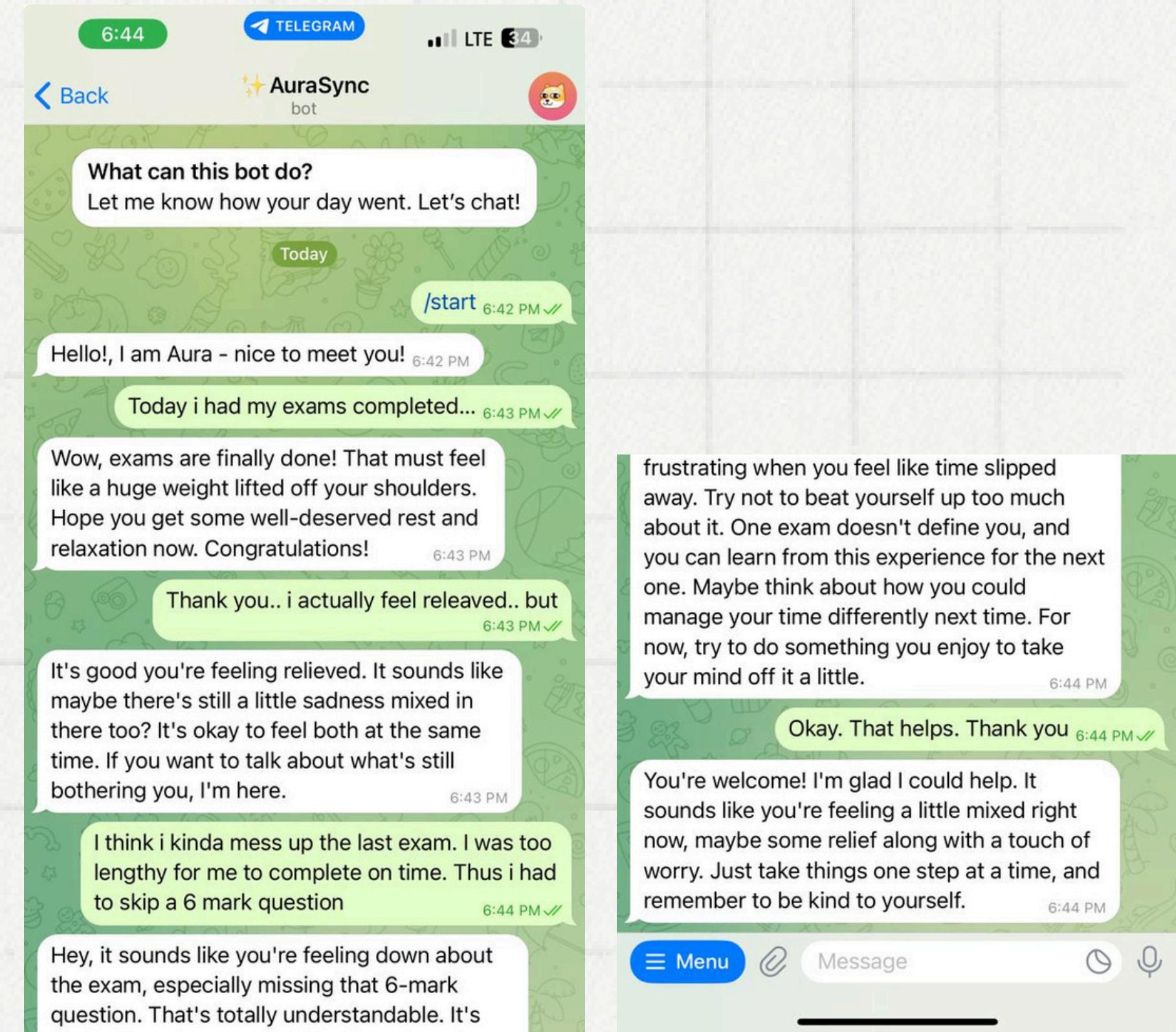


Telegram App - ChatBot UI

- Telegram Bot Integration
- Telegram Bot built using telebot library
- Responds to /start and text messages
- Predicts emotion via all 4 models
- Returns multi-model results to openai in real-time which replies back with motivations according to emotion.

Real-Time Prediction Demo

- User inputs text via Telegram
- Bot processes using vectorizer & model pipeline
- Responds with predicted emotion from all models



Telegram App - ChatBot UI

- Users input messages for analysis.
- Model predicts sentiment using a prediction function.
- Displays sentiment scores.
- Interactive and user-friendly interface.

References and Publications

- <https://scholarworks.uark.edu/etd/4768/>



**Thank you
very much!**