Emotion Classification Application

Project Overview

Our project revolves around predicting emotions for each phrase of any given video file. Our current task comes under the realm of Natural Language Processing (NLP). In our project we utilized a DeBERTA model that was fine-tuned using data from an agency called Content Intelligence Agency. Their dataset aims for a set of emotions: neutral, happiness, sadness, anger, surprise, fear, and disgust. Which therefore help us make more accurate models and classifications in our application.

Data Pipeline and Preprocessing

We have an existing pipeline of data that begins with the preprocessing and cleaning of the input data. In the same pipeline, emotions are channelled to generic categories. This is necessary because the original output contained sub-emotions, which are then grouped under the main emotion categories mentioned above. After this step, we create two datasets. We tokenize both datasets using the BERT tokenizer since it is utilized by the DeBERTA model. We also extract the following features from the text:

- Part-of-speech tagging
- TextBlob sentiment analysis
- VADER sentiment analysis
- EmoLex emotion lexicon
- TF-IDF vectorizer instance
-

These features improve the data and support the emotion classification task.

Model Training and Evaluation

Then, once the features are extracted, we proceed to the training pipeline. The pipeline uses the pre-processed data to fine-tune the DeBERTA model and evaluate its performance. The best-performing model is then deployed on Azure and registered for use in real-time.

User Interface and Usage
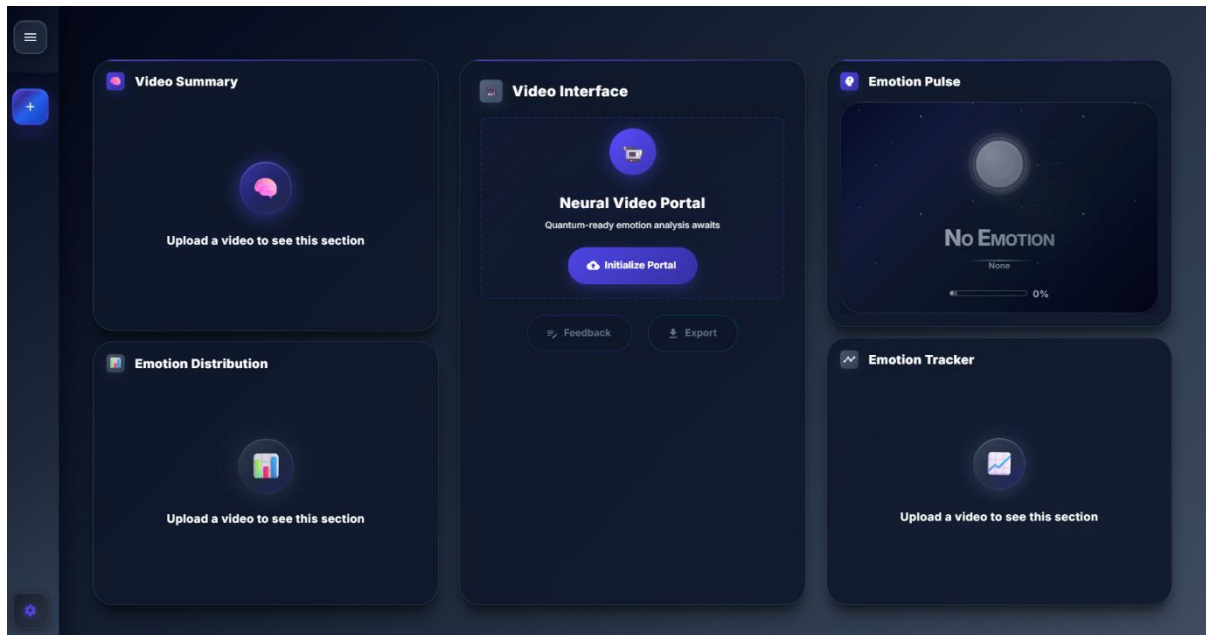
For user interface, the system offers an interactive interface. The user simply inputs a YouTube URL as a prediction analysis input. The system then analyses the video transcript and predicts the emotion for each sentence. For a 30-minute YouTube video, the system is approximately 2–3 minutes to generate predictions.
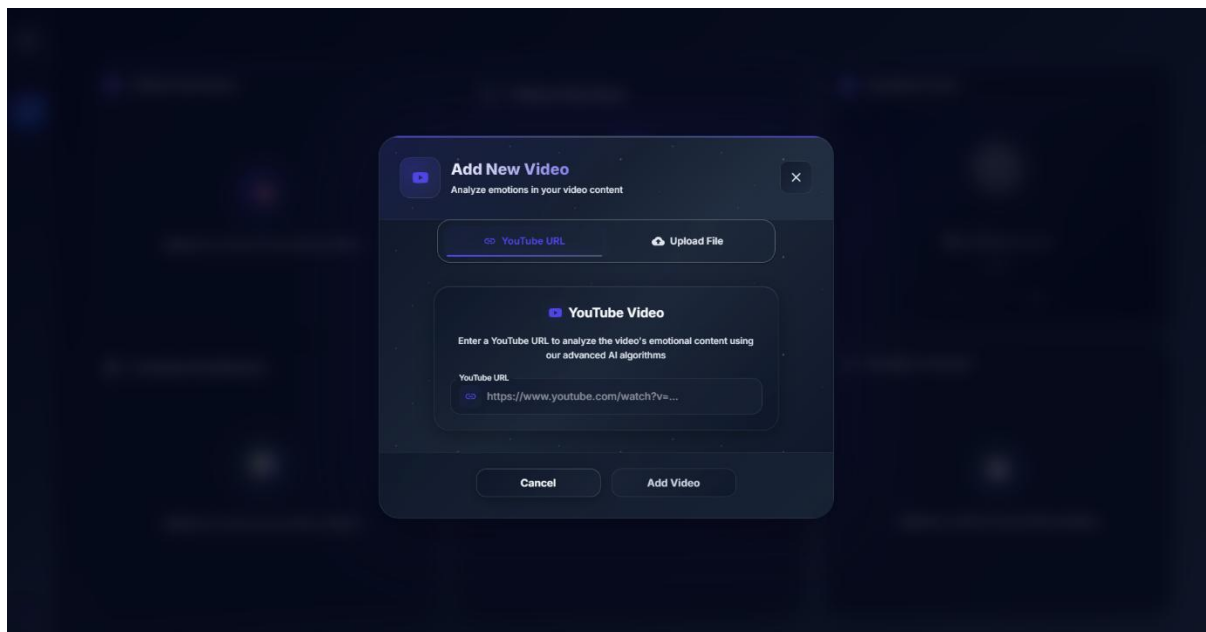
Afterwards the user is displayed the predicted emotion and sub-emotion for each sentence, in real time. Thus, the interface also allows the audience to go into extended emotional analysis for the entire video.
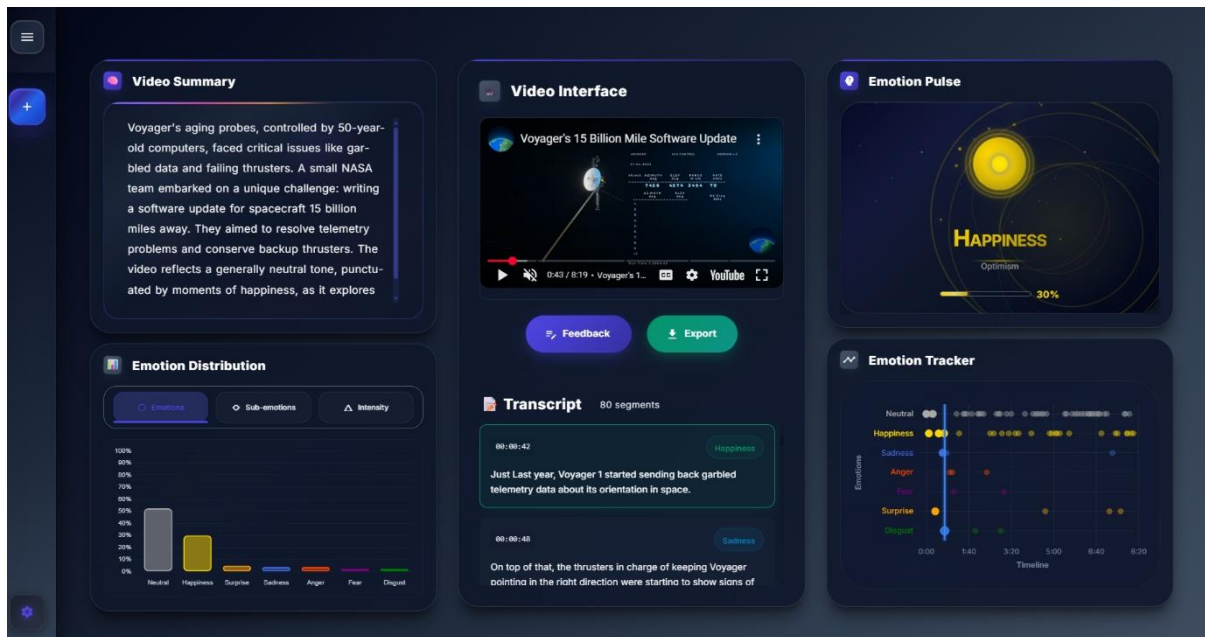
Additional Features
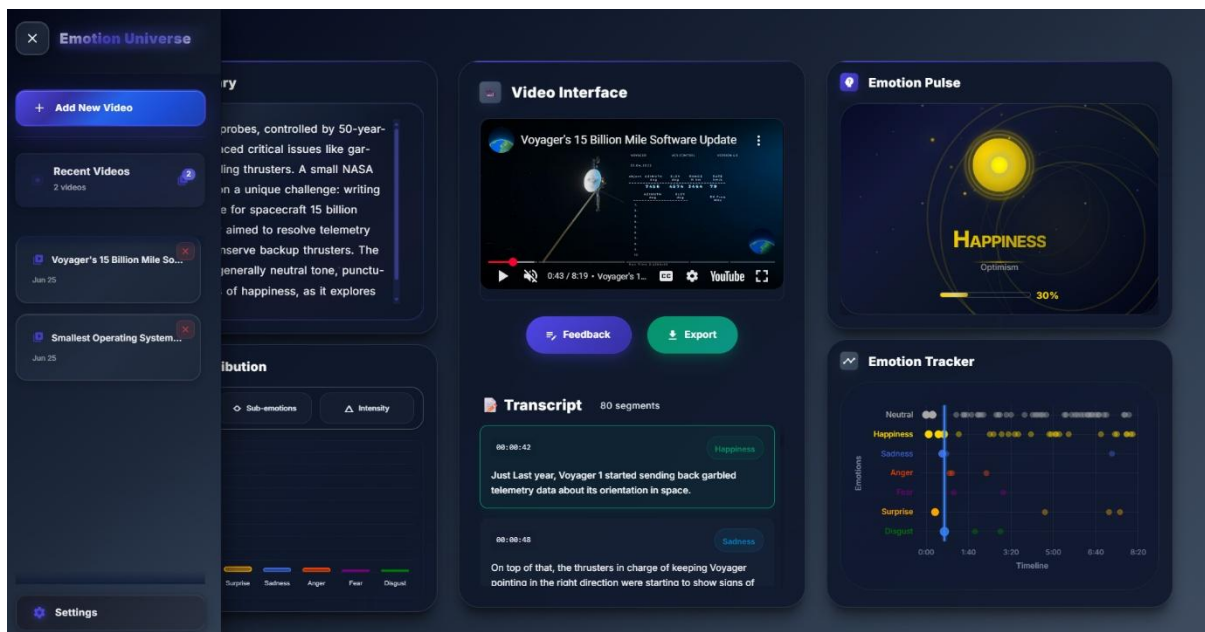
Besides the core functionality which we spoke about before, the app also includes two additional features:

1. Downloadable Analysis

The user can download the results of the analysis onto their device. The downloadable content includes:

- Emotion analysis

- Video-level analysis
- A summary
- History

Essentially it entails the transcription along with predicted sub-emotions and main emotions. Lastly all the previous analyses and transcripts that are also stored in the History section of the user interface for later reference.

2. Feedback for Improvement

In case the user feels that any of the predicted emotions is incorrect, they can give feedback. The feedback therefore will be used to improve the model in future releases by contributing to further training and fine-tuning.
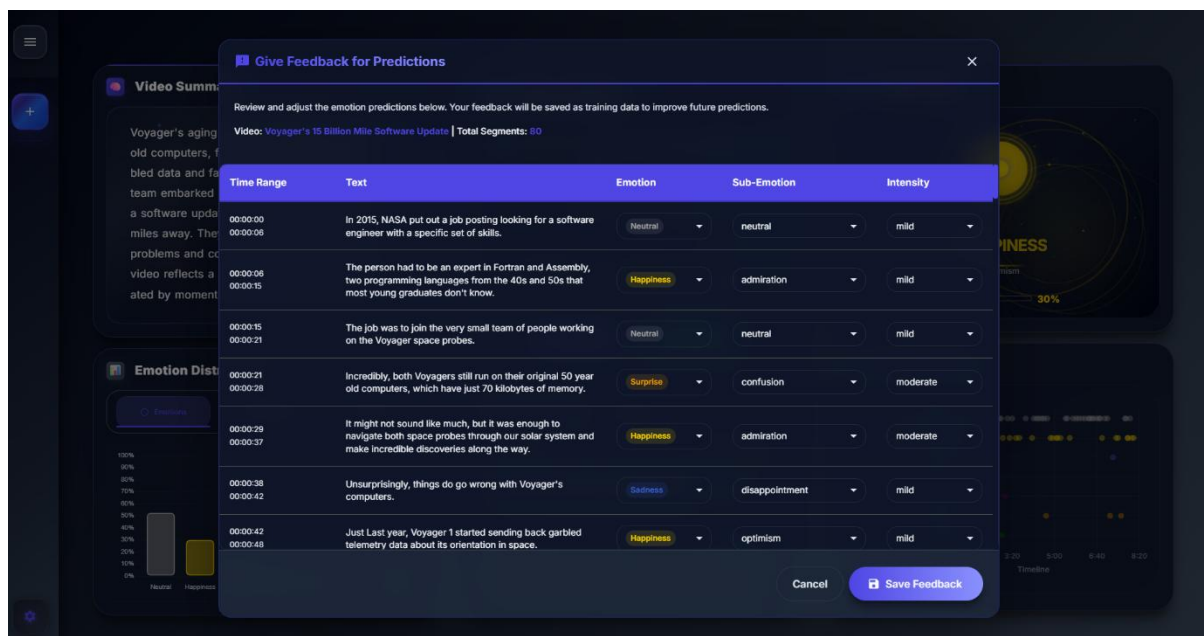
This project was done by group NLP6

The members of this group were as follows:

Kosta Ljubisavljevic (233101)

Ricardo Rino De Sousa (235038)

Soheil Mohammadpour (231754)

Noah Ivanisevic (235738)

Erfan Salour (230499)