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NATURAL LANGUGAGE PROCESSING: EMOTION CLASSIFICATION

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GROUP 24

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AGENDA

- Introduction
  - Client Value
- Dataset
  - Feature Extraction
- Implemented Models
  - Strengths & Weaknesses
- Error Analysis
- Annotations
- Limitations
- Next Steps & Recommendations

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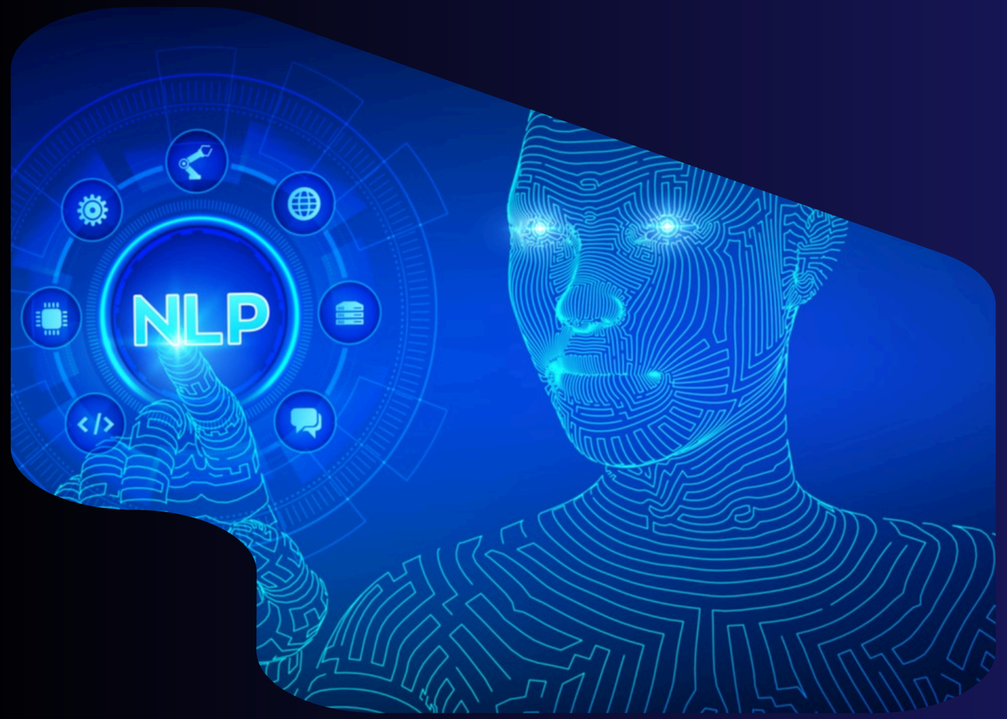
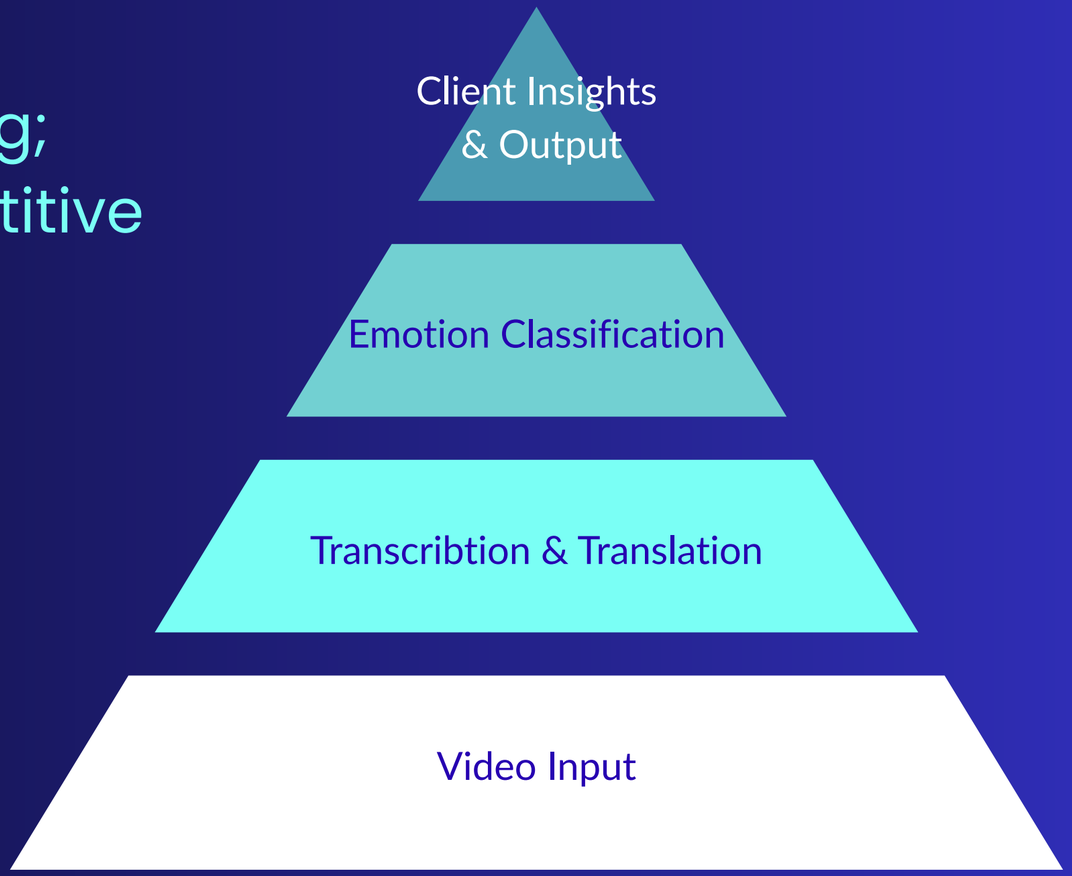
INTRODUCTION



- Problem Definition
  - Emotion Classification in NLP
- Use case
  - Identify emotions expressed in video content to support media creators
- Client
  - CIA - They use AI to analyse every single detail of your film, series, TV-show or video

CLIENT VALUE

- Time & Cost Savings
  - Automates emotional tagging;
  - Reduces human error in repetitive tasks.



PRE-PROCESSING

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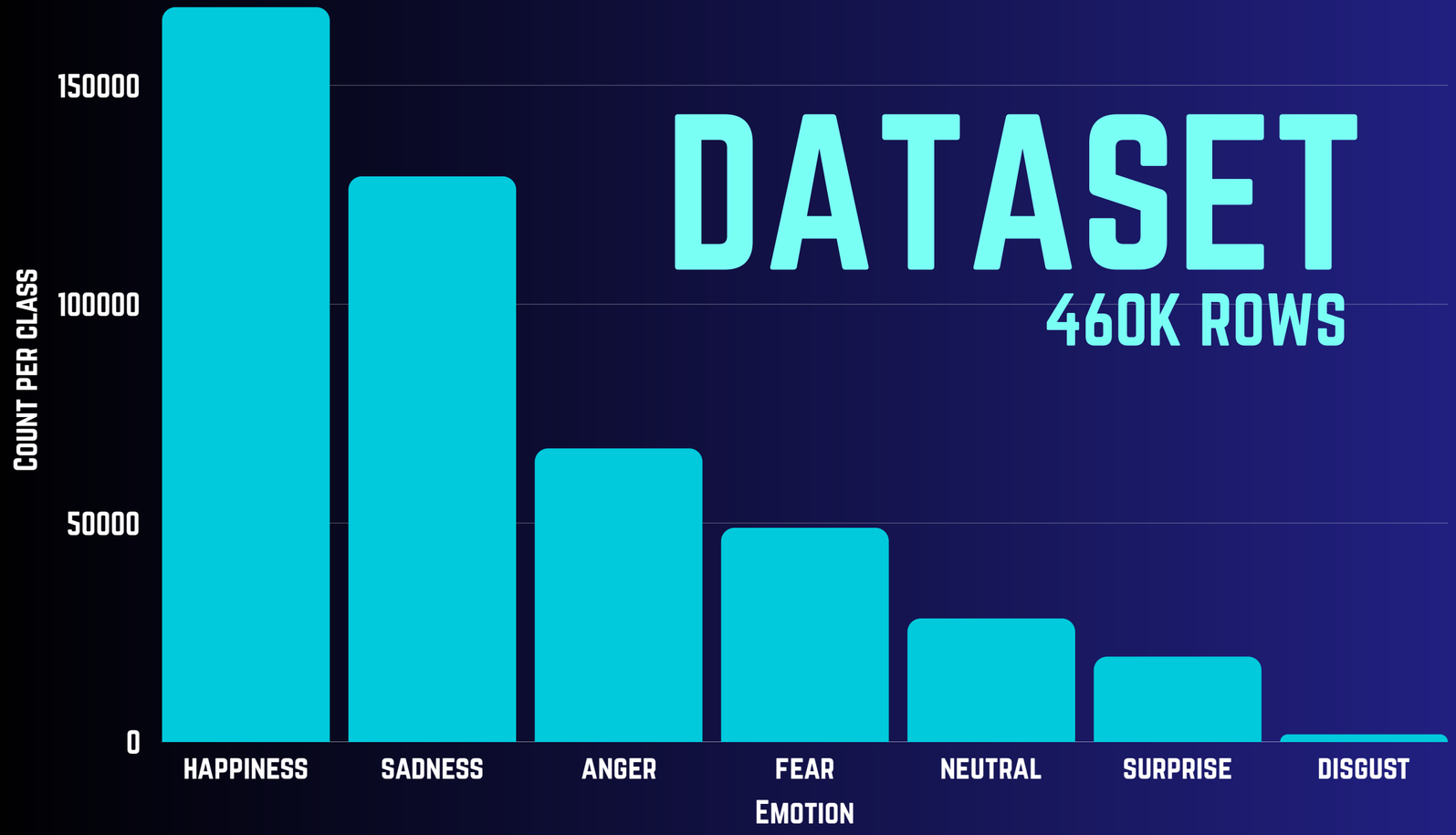
Used Datasets
MELD, GoEmotions, CAREER



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FEATURE EXTRACTION

- POS Tagging
- CountVectorizer & TF-IDF
- Sentiment Scores
- Embeddings

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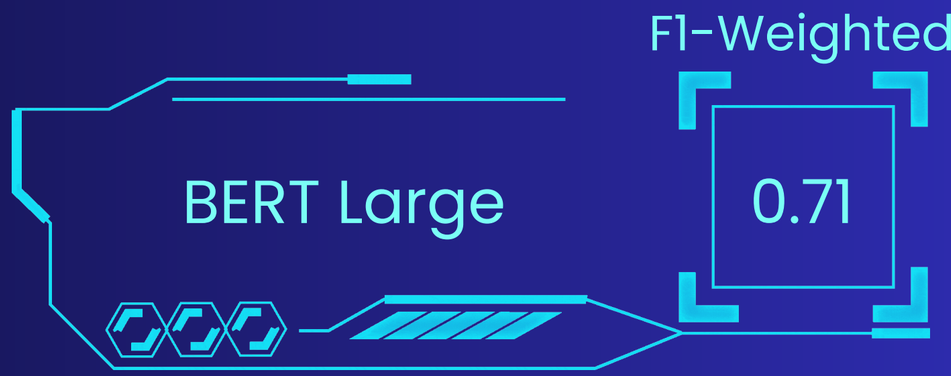
IMPLEMENTED MODELS

APPROACH	WEIGHTED F1-SCORE
Naive Bayes	0.304
Logistic Regression	0.332
RNN	0.32
LSTM	0.31

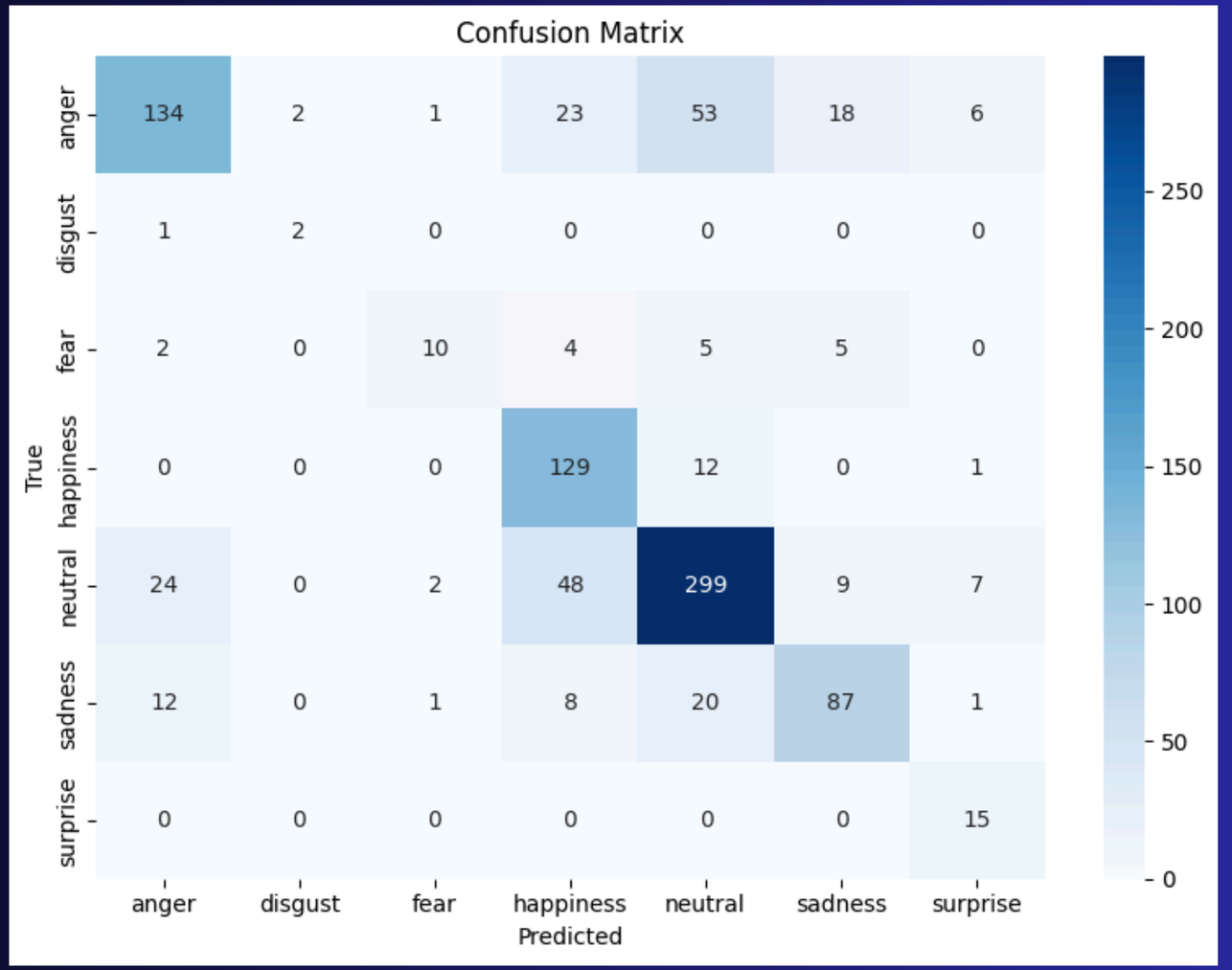


RESULTS

FINAL MODEL

STRENGHTS

- High precision and recall for neutral and happiness
- Anger is recognized **well** with some overlap with **sadness** and **neutral**
- Few false positives for **rare** classes like **disgust** and **surprise**



WEAKNESSES

- Erros between **anger**, **sadness**, and **neutral**
- **Fear** often confused with **neutral** and **happiness**
- Poor performance on **disgust** and **surprise**

emotions	precision	recall	f1-score
anger	0.77	0.57	0.65
disgust	0.5	0.67	0.57
fear	0.71	0.38	0.5
happiness	0.60	0.91	0.73
neutral	0.77	0.77	0.77
sadness	0.73	0.67	0.70
surprise	0.5	1	0.67
macro avg	0.66	0.71	0.66
weighted avg	0.73	0.72	0.71

ERROR ANALYSIS

ERROR ANALYSIS

- Label Issues
  - Emotional sentences mislabelled as ‘neutral’
  - Flat sentences labeled as ‘happiness’
- Translation/Transcription Errors
  - Lost words & incomplete sentences
  - Unclear phrases due to poor transcription
- CIA Test Set Fixes
  - Corrected many wrong labels & translations
  - Improved evaluation reliability

EXAMPLES

Don't worry.	CIA: neutral Actual: happiness
We immediately go home.	CIA: happiness, Actual: neutral
For my daughter.	CIA: happiness, Actual: neutral
We were better with my father.	CIA: neutral, Actual: sadness (nostalgia)
Like Sashka's dog.	CIA: happiness, Actual: neutral
But there is no way to do because of	CIA: anger, Actual: sadness (incomplete sentence)
Lilyana has been around the neighborhood several times	CIA: happiness, Actual: neutral
that she has a major responsibility on your life and love.	Incorrect Transcription (One sentence divided as 3 distinct)
The idea of Ã¢â‚¬â€Ã¢â‚¬â€the box sounds very good to me.	Example of Incorrect Translation
I am lumpy that Velina	Example of Incorrect Transcription

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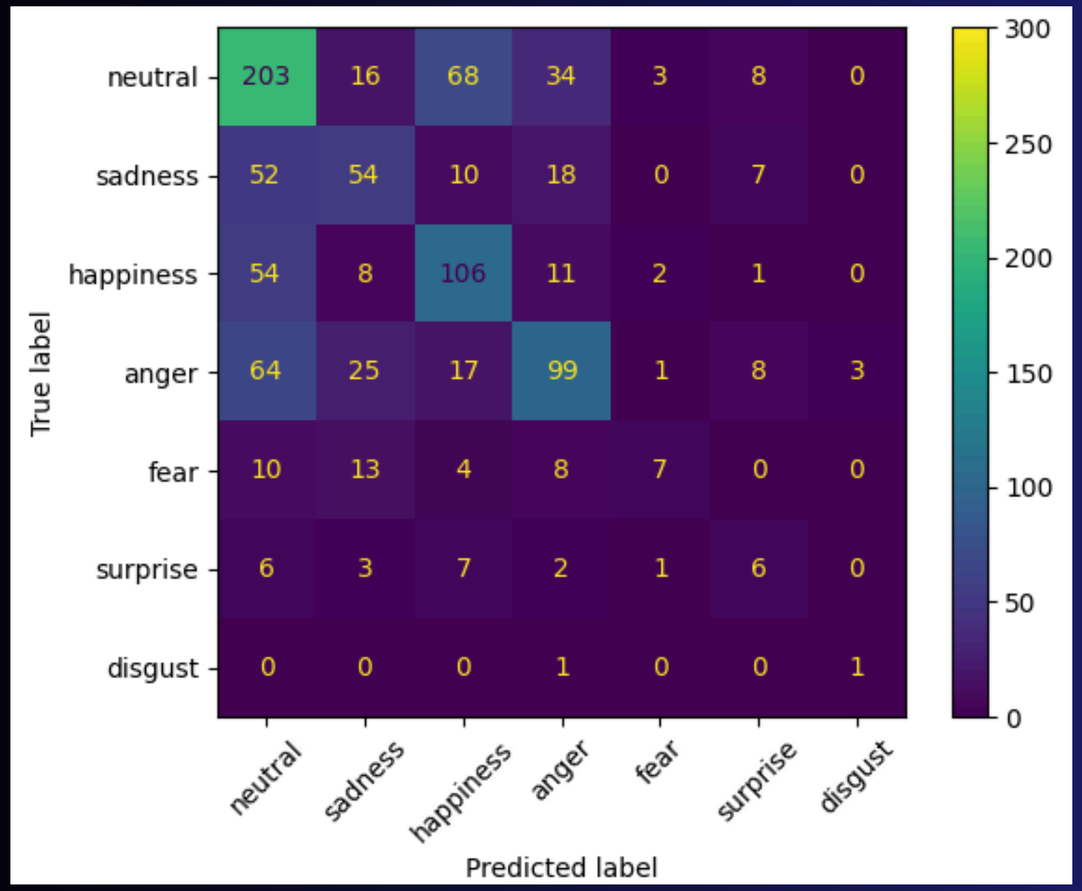
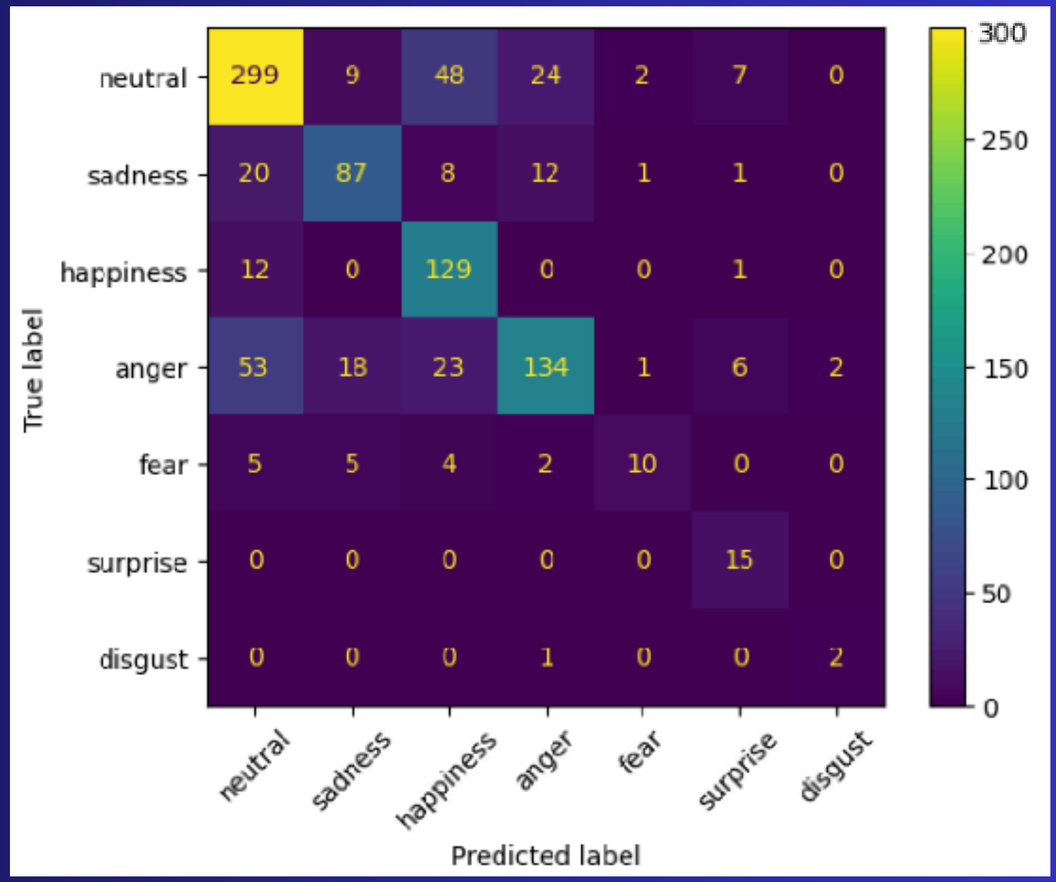
ANNOTATIONS



Before

F1-Weighted = 0.499



After

F1-Weighted = 0.714

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LIMITATIONS

- Data Imbalance
- Incomplete transcription
- Translation Errors
- Context Loss in Text-only Analysis

NEXT STEPS & RECOMMENDATIONS

- Improve data quality
- Collect more diverse training data
- Implement the whole pipeline into an application

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THANK YOU

FOR YOUR ATTENTION

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