

TESSA

Text Emotion System Sentiment Analysis

CSC 44800: Artificial Intelligence
Professor: Yunhua Zhao
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Georgios Ioannou
Meng Wai Chan
Farhanul Thouship



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Introduction



**Georgios
Ioannou**

Computer Science

CUNY City College of
New York



**Meng Wai
Chan**

Computer Science

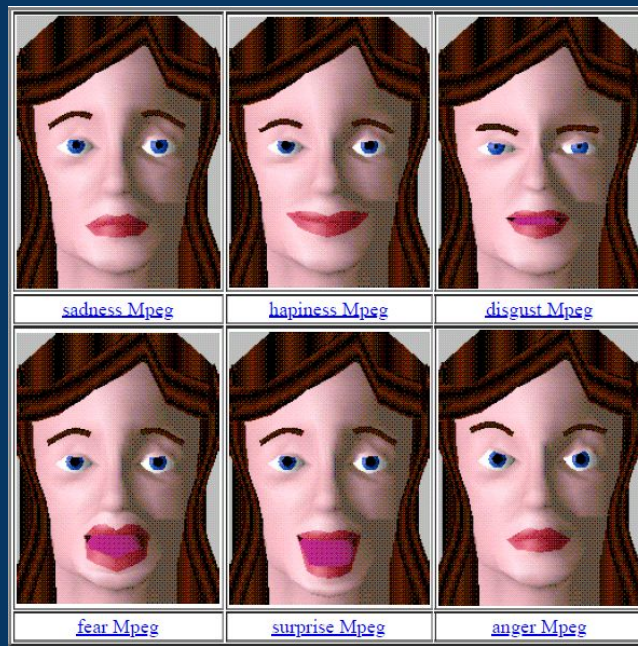
CUNY City College of
New York



**Farhanul
Thouship**

Computer Science

CUNY City College of
New York



Goal

Interpreting human emotions is hard, even for us humans!

So, can we interpret human emotions on machines with reasonable accuracy?

Action

Interpret a user's human emotion from text using Machine Learning!

Interpret the six universal expressions!



02

Goal

1. IDENTIFY USE CASES:

- Acting
- Social Media Postings
- Text Messages
- Customer Service
- Product Feedback
- Market Research
- Interview Essay Questions
- Human-Robot Interaction



02

Goal

2. EXPLORE AND IMPLEMENT SOLUTIONS

Particularly, we chose to solve the sub-problem

- **Actors practicing:** Emotion detection can be used to provide real-time feedback on an actor's performance.

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USER SCENARIOS

USER SCENARIO 1

Prompts user with:

- A text input field

Classify Button:

- Take user input text
- Send input text to the model
- Return the emotion from the user input text

USER SCENARIO 2

Prompts user with:

- Emotion/Expression to convey

Record Button:

- Taking actor's voice
- Send it to a pre trained speech to text model

Classify Button:

- Take text from pretrained model
- Send that text to the model
- Return the emotion from the actor's text

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Solution

- Classification Problem
- 6 emotion values (classes)
 - Anger, Fear, Joy, Love, Sadness, Surprise
- **Training data** = 16, 000 unique text documents (rows)
- **Validation data** = 2, 000 unique text documents (rows)
- **Testing data** = 2, 000 unique text documents (rows)
- Sourced posts from Twitter API
- Main dataset:
 - <https://www.kaggle.com/datasets/praveengovi/emotions-dataset-for-nlp>
- Supplementary dataset to preserve class balances if needed:
 - <https://huggingface.co/datasets/dair-ai/emotion/viewer/unsplit>

04

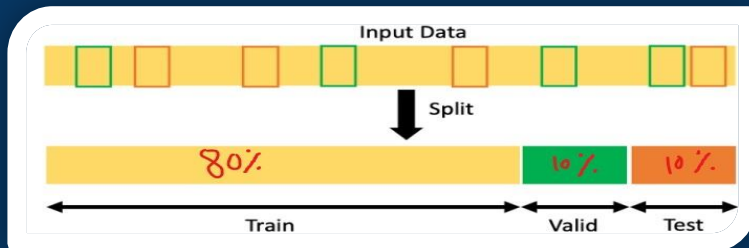
Solution

Models to try:

1. LSTM
2. CNN
3. MultinomialNB
4. SVM
5. Logistic Regression
6. Decision Tree
7. Random Forest
8. XGBoost

Training/Testing/Validation Technique:

1. k-fold Cross-Validation
 - $k = 10$



Technologies That May Be Utilized



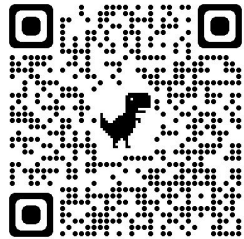
1. Tensorflow
2. Pytorch
3. Keras
4. NLTK
5. SciKit-Learn
6. Numpy
7. Pandas
8. Imbalanced-Learn
9. Plotly
10. Matplotlib
11. Seaborn
12. Jupyter Notebook
13. Python
14. Flask
15. Streamlit
16. Hugging Face
17. HTML
18. CSS
19. JavaScript
20. Git
21. GitHub

Questions & Answers

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**Georgios
Ioannou**



**Meng Wai
Chan**



**Farhanul
Thouship**

