

TESSA

Text Emotion System Sentiment Analysis

CSC 44800: Artificial Intelligence
Professor: Yunhua Zhao
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Introduction



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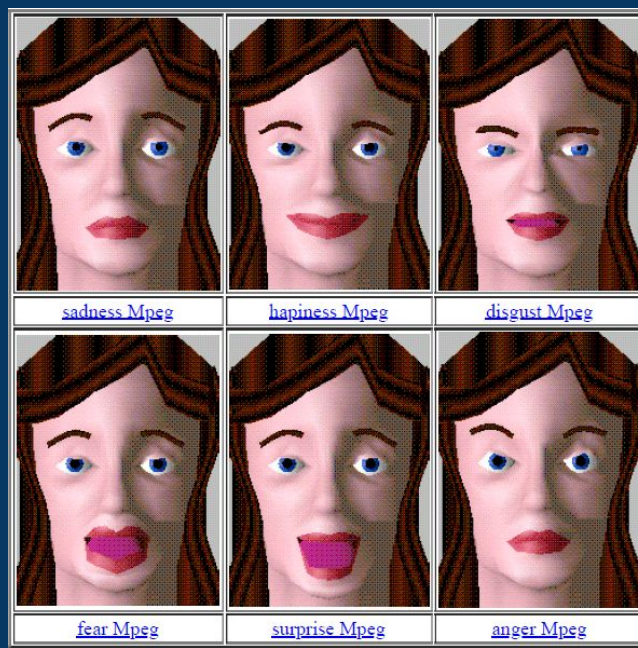
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Goal

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

<https://www.kaggle.com/datasets/praveengovi/emotions-dataset-for-nlp>

- Supplementary datasets to preserve class balances

<https://www.kaggle.com/datasets/shivamb/go-emotions-google-emotions-dataset>

<https://huggingface.co/datasets/dair-ai/emotion>

04

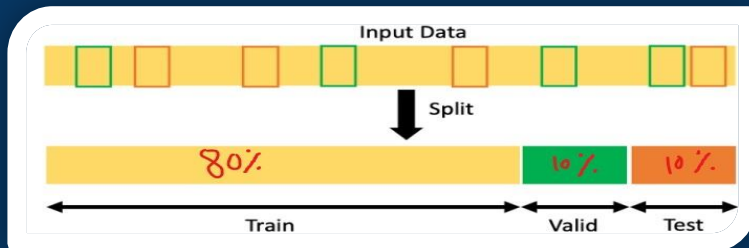
Solution

Models to try:

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

Training/Testing/Validation Technique:

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



Technologies That May Be Utilized



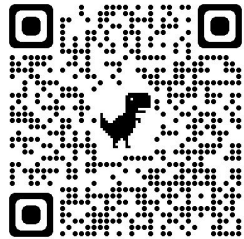
1. Tensorflow
2. Pytorch
3. Keras
4. NLTK
5. SciKit-Learn
6. Numpy
7. Pandas
8. Imbalanced-Learn
9. Plotly
10. Matplotlib
11. Seaborn
12. Jupyter Notebook
13. Python
14. Flask
15. Streamlit
16. Hugging Face
17. HTML
18. CSS
19. JavaScript
20. Git
21. GitHub

Questions & Answers

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