

Emotion Detection on song lyrics stanzas

TEXT ANALYTICS

Group 2

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Introduction

This report illustrates development and findings of Group 2's project for the course Text Analytics, Academic Year 2024-2025.

Motivation and project goal

This project's goal is the development of various Machine Learning models that perform emotion detection on songs' lyrics.

The emotional tone of songs can be useful for many things, such as automatized playlist creation, or songs' organization, offering an alternative to the more traditional genre-based classification.

To obtain a deeper understanding of emotional fluctuations within the texts, the models assign emotion labels to individual stanzas instead of full songs. The emotional classification is based on Robert Plutchik's eight primary emotions (shown in figure 1), offering a comprehensive range for representing diverse emotional states.



Figura 1: Plutchik's eight primary emotions

Dataset overview

The dataset utilized in this project represents a subset of songs derived from the Genius Song Lyrics Dataset^[1]. The dataset contains 11 attributes that represent various song-related information, including the lyrics. The original dataset includes songs in all languages; this work focused solely on English-language songs.

The dataset originally didn't contain emotion labels, essential for training the models. To create the ground truth, the model Albert Base v2^[2] was used, classifying stanzas' lyrics into Plutchik's eight primary emotions. Due to the limited computational power, this process was time-intensive, ultimately resulting in a limited dataset.

1. Preprocessing

2. Static Models

2.1 Random Forest

2.2 SVM

3. Neural Networks

3.1 One-Dimensional Convolutional Neural Network

3.2 Recurrent Neural Network

Key findings and conclusions

Bibliografia

- [1] *Genius Song Lyrics*. URL:
`https://www.kaggle.com/datasets/carlosgdcj/genius-song-lyrics-with-language-information?select=song_lyrics.csv`.
- [2] *Albert Base v2*. URL: `https://huggingface.co/albert/albert-base-v2`.