PROJECT 3

MOODIFY LYRIX

Revamp your favorite songs to match your every mood with our innovative lyric regeneration app

Prepared & Presented By

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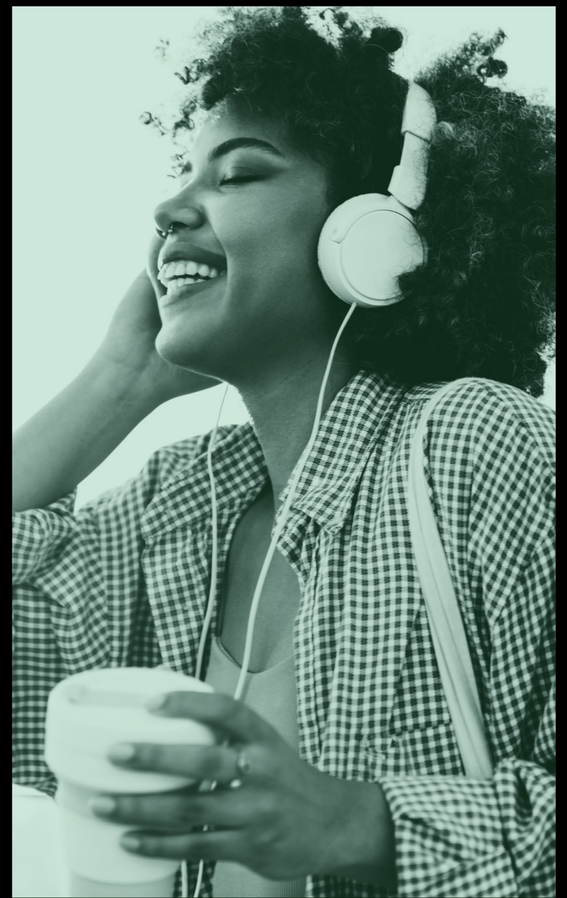
Start Slide

MOODICY LYRIX GITHUB



MOODIFY LYRIX

AGENDA

1. Project overview
2. Our process
3. Model review
4. Questions that surfaced
5. Results & conclusion

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MOODIFY LYRIX

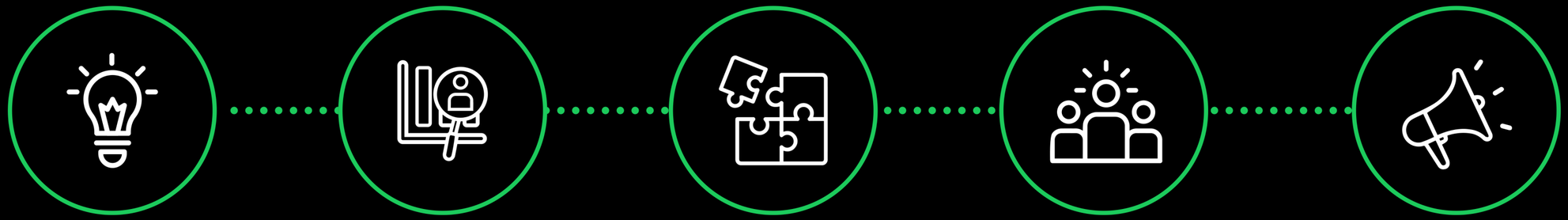
PROJECT OVERVIEW

In our totally rad project, we cranked up the tech and trained killer models to analyze the sentiment of over 5,000 epic songs, capturing their raw, emotional power. We then unleashed a gnarly tool that lets users plug in any song, decode its vibe, and rewrite the lyrics to match a new mood, all with the help of our mind-blowing models.

We're talking about turning every user into a lyrical rock god, rocking their favorite tunes to fit any killer vibe! Rock on!

MOODIFY LYRIX

OUR PROCESS



Ideate & Select Project

We jammed on ideas like illness predictors and spam filters, but our love for music rocked harder.

So, we built a tool that lets users tweak their favorite song lyrics to match any mood.

Data selection & Cleaning

Next, we rocked the Muse dataset for thousands of songs titles labelled with sentiments. We scraped the web for lyrics to correlate with the listed emotions, making our models shred like never before.

Model Test & Training

We cranked up our tool with the BERT and VADER models.

BERT uses bidirectional transformers to catch word context for language tasks, while VADER rocks sentiment analysis in social media text.

Built User Interface

We then unleashed a rad Gradio app, powered by our two models, where users can jam in their favorite songs, vibe with the current sentiment, and rock out by tweaking the lyrics to match their mood!

Present Project

Created an epic presentation and unleashed the power of Moodify Lyrix to the world, rocking the stage and leaving everyone in awe of its brilliance. Brought the house down and showcased its incredible features.

BERT MODEL

Model Overview

BERT, or Bidirectional Encoder Representations from Transformers, reads text both forward and backward, capturing context like a rockstar. It's trained on massive data, excelling in tasks like question answering and translation. The ultimate AI for transforming text into pure brilliance! 🤘

Fine Tuning

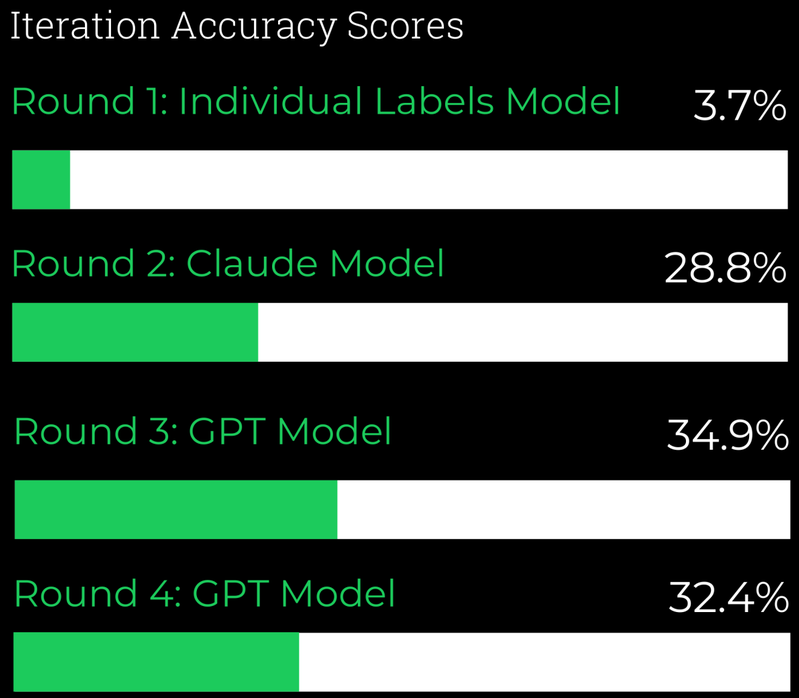
We took a pre-trained BERT model and tuned it over 3 epochs with labeled lyrics data. Yes, we taught BERT what it really meant to be a rock star

Evaluation Process

Our BERT model was evaluated using performance metrics like accuracy and precision.

Findings & Results

Initially, our BERT model's accuracy was low due to the number and orthogonality of our labels, but through rigorous data cleaning and preprocessing, we improved its performance significantly. As a result, the model's accuracy increased to nearly 35% demonstrating the impact of high-quality data on model efficacy.



VADER MODEL

Valence Aware Dictionary and sEntiment Reasoner

Model Overview

VADER, the rockstar of sentiment analysis, uses a killer lexicon and rules to nail the emotional tone of text. It detects overall sentiment in social media and informal chat and classifies it as positive, negative, neutral, and compound. Perfect for analyzing massive amounts of text with rock-solid accuracy! 🤘🤘

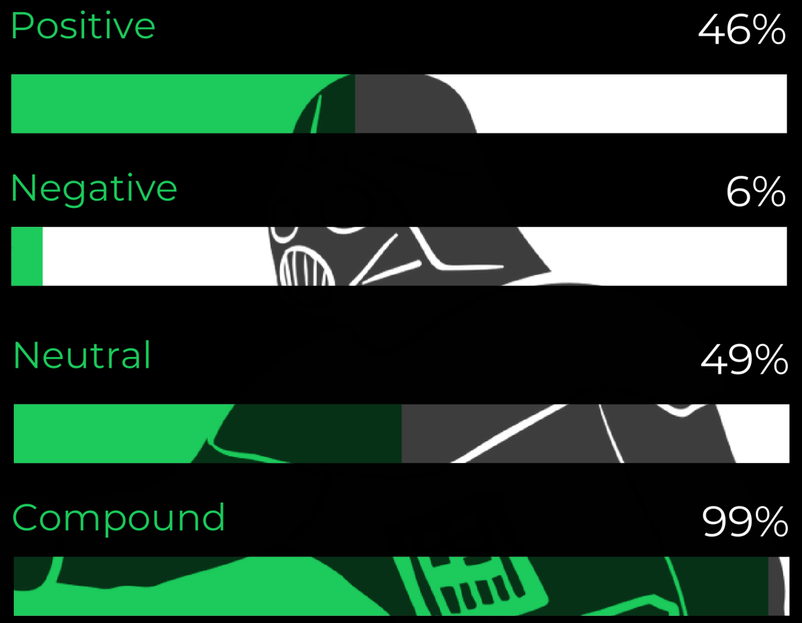
- Excels at capturing nuances of slang, emojis, and even grammatical errors.
- Struggles with context-heavy text
- Can be applied to understand how customers feel about products & services to gauge customer satisfaction, identify issues, and improve offerings.

Moodify Lyrix:

Stage 1: Identify the sentiment of user chosen song lyrics

Stage 2: Enable the user to change the sentiment to match their mood using the Gradio interface, then perform a VADER sentiment analysis to the result.

Leonard Cohen's "Hallelujah" Vader Sentiment Analysis Results



MOODIFY LYRIX

Lyrics
Reimagined

THE USER EXPERIENCE

STAGE	FOUNDATION	MODELS	INTERFACE	EXPERIENCE
GOALS	• Obtain diverse song lyrics dataset that includes labeled sentiment for model training • Prepare data for model training	• Train BERT model using labeled data to an acceptable performance level • Initialize VADER model for sentiment analysis	• Allow users to input a song and title • Allow users to input desired sentiment to adjust existing lyrics	• Show song lyrics selected by the user, including sentiment analysis scores • Allow user to select new sentiment for ChatGPT to rewrite lyrics
DOING	• Data collection and organization • Data cleaning	• Model training and evaluation • API integration to obtain song lyrics from Genius.com	• Created Gradio interface to retrieve user inputs and show output data/text	• Retrieve song lyrics and analyze sentiment • Send preferred sentiment and original lyrics to ChatGPT
THINKING	• What dataset to use? • How to preprocess the data?	• What is an acceptable accuracy level for the BERT model? • How to easily obtain song lyrics for any user inputed song?	• How to obtain lyrics from API and integrate VADER model for sentiment analysis • How to adjust lyrics to desired user sentiment through ChatGPT?	• How to create a user friendly interface? • How to show lyrics (original + new) and sentiment analysis in a clean format?
OPPORTUNITIES	• Potential use of alternative datasets to compare outcomes.	• Enhance model training techniques • Exploration of alternative models for sentiment analysis	• Explore alternative interface platforms • Explore alternative LLMs	• Improve alignment with user preferred sentiment • Enhance lyric generation techniques (optimized prompt for LLM)

MOODIFY LYRIX

Lyrics Reimagined

INITIAL WIREFRAME

Welcome to Moodify Lyrix

Transform your favorite song's lyrics to fit your mood with our cutting-edge sentiment converter app!

The input of the song and artist will be provided by the user

Input a Song

Input Artist

Search

What vibe are you feeling?

Search

User provides a sentiment that they want to change the lyrics to match

Lyrics are scraped from genius.com

Lyrics

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New Lyrics

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New lyrics based on user's sentiment preference are generated from ChaptGPT API

Sentiment scores are derived from our trained Vader Model

Vader Sentiment

Postive	Negative	Neutral	Compound
.5225	.5225	.5225	.5225

Vader Sentiment

Postive	Negative	Neutral	Compound
.5225	.5225	.5225	.5225

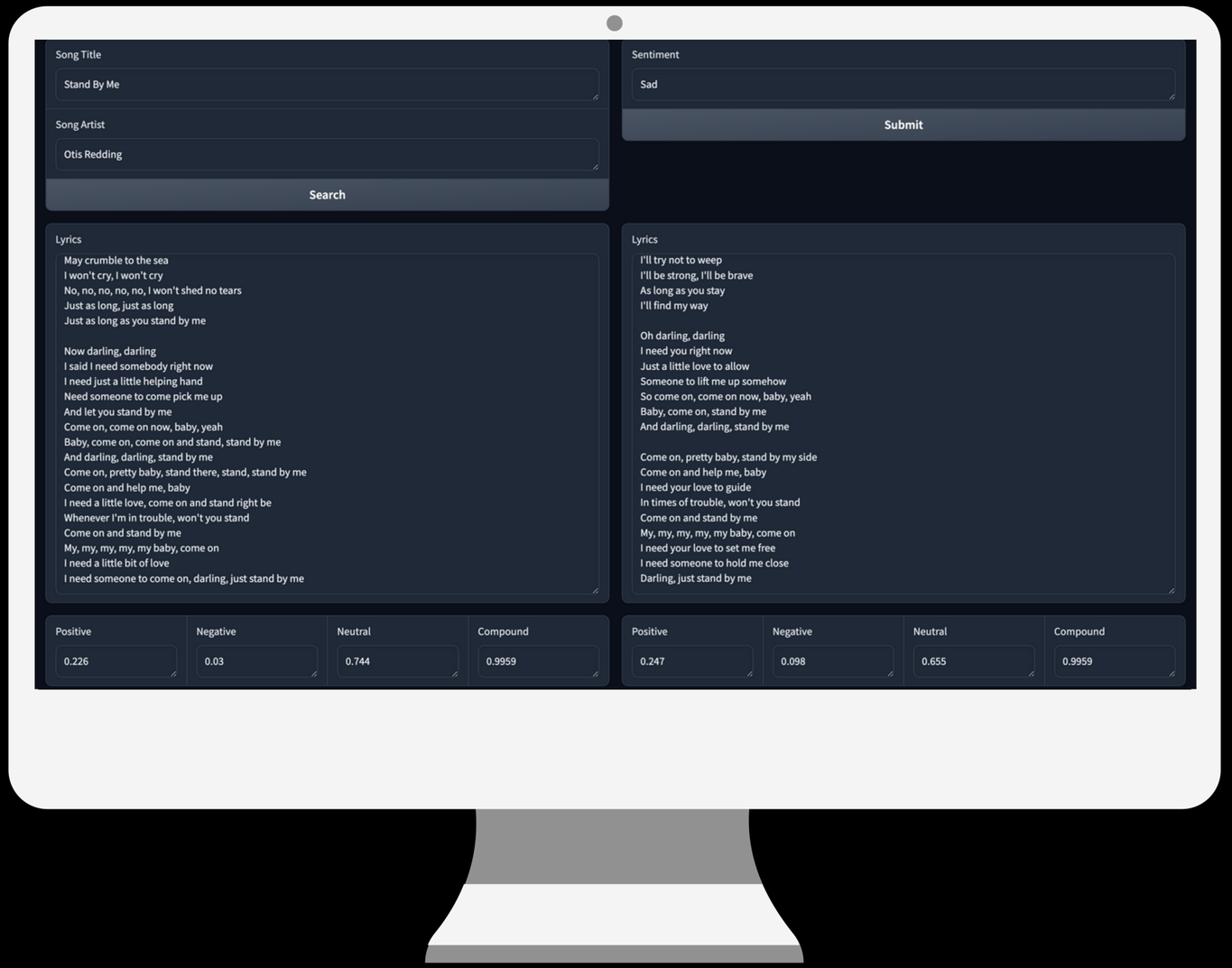
MOODIFY LYRIX

Lyrics
Reimagined

USER INTERFACE

Moodify Lyrix Link

CLICK HERE



FURTHER ANALYSIS & QUESTIONS

Subsequent Versions of Moodify Lyrix:

Auto-populating feature In the user input cells

Integrate with text-audio app (Suno API is forthcoming)

Correct misspellings and still accurately find the intended song lyrics

Analyze lyrics with our own fine tuned BERT Model

Integrate with text-video app

RESULT & CONCLUSION

Results

Our initial BERT model was able to correctly label lyrics 4% of the time, with 100 different categories.

Grouping the labels into more distinct categories brought that accuracy into the 30% range, which was a 750% improvement!

AI enables simple and fun user interfaces to accomplish seemingly diffcult tasks

Conclusion

Sentiment analysis is challenging due to language ambiguities, contextual complexities, subjective interpretations of emotions, data quality concerns, and domain-specific nuances. Understanding sentiment accurately required us to navigate navigating through these factors. Despite these challenges, advancements in NLP and machine learning have contributed to improving the accuracy of sentiment analysis models over time. and enabled us to create a fun and rewarding project.

QUESTIONS?