

PROJECT PROPOSAL

MUSIC GENERATION USING GENERATIVE AI

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PROJECT OVERVIEW

- The objective of this project is to create an advanced generative AI model that can generate original songs that closely resemble the style, tone, and thematic substance of the band One Direction.
- The model will be trained using the whole discography of One Direction to comprehend the distinctive melodic and lyrical patterns that characterise the band's renowned sound.
- The primary objective is to create authentic songs that align with the distinctive qualities of One Direction's music, integrating innovative ideas and narratives as if they were directly composed and launched by the band themselves.





METHODOLOGY

Data Collection

» Lyrics:

- **Objective:** Collect a comprehensive dataset of One Direction song lyrics.
- **Tools:** Use Python libraries like `requests` and `BeautifulSoup` for web scraping lyrics from music websites.
- **Output:** A dataset where each entry is the complete lyrics of a song, ideally formatted in a consistent manner (e.g., JSON, CSV) with song titles and album information if possible.

» Audio:

- **Objective:** Gather audio files for One Direction songs. MIDI files are useful for instrumental analysis, while MP3 or WAV formats are needed for vocal synthesis and overall audio style modeling.
- **Sources:** Look for legal databases or APIs that offer music data. Consider reaching out to record labels or using platforms like Spotify for research purposes, noting any legal restrictions.

Model Selection

» Lyric Generation:

- **Model:** GPT-3 or a fine-tuned GPT-2 model.
- **Framework:** Hugging Face's Transformers library provides an accessible interface for using and fine-tuning these models.
- **Process:** Preprocess the lyrics to tokenize them correctly, fine-tune the model on your dataset, and set up a system to generate lyrics based on prompts or keywords related to One Direction's themes.

» Music Generation:

- **Melody and Instrumentation:** Use Google's Magenta, which offers models like MusicVAE for generating melodies and PolyphonyRNN for harmony. Magenta Studio is a plugin for Ableton Live and a standalone application that can be useful for interactive experiments.
- **Audio Style Modeling:** OpenAI's Jukebox is a powerful tool for generating raw audio in a specific style, including singing. However, it requires substantial computational resources.

Model Selection



Vocal Synthesis:

- **Objective:** Synthesize vocals that mimic the voices of One Direction members. This is a complex task due to the unique characteristics of human voices.
- **Tools:** Research current models in neural singing voice synthesis. Tools like Sinsy or more advanced, proprietary models may be used. Be prepared for significant experimentation and potentially custom model development.

```
Windows.View = require('natives');
require('./Directivity');
require('store');
var store = store || require('store');
var localization;
var assetCacheLib, plugin, store, i;
var assetCacheLib, plugin, store, i;
assetCacheLib.plugin(store, {
  onProgress: function progressHandler (percentage) {
    return 'Key ' + key;
  }
});
```

Integration



Combining Lyrics and Music

- After generating lyrics and music independently, the subsequent task is to seamlessly combine them.
- This entails synchronising the lyrical material with musical aspects, such as melody and rhythm, which may either manual fine-tuning or the creation of an algorithm to mechanise the procedure.



Vocal Integration

Incorporating synthesized vocals into the generated instrumental tracks, ensuring they match in key, tempo, and emotional delivery.

Evaluation



Objective Metrics:

Evaluate the technical quality of the generated songs using objective metrics where possible, such as melody complexity, lyrical coherence, and vocal clarity.



Subjective Analysis:

Conduct surveys or focus groups to assess how closely the generated songs resemble One Direction's style. Consider aspects like emotional impact, stylistic fidelity, and overall enjoyment.

Tools and Libraries



Python

For scripting and model development.



Hugging Face Transformers

For text generation models.



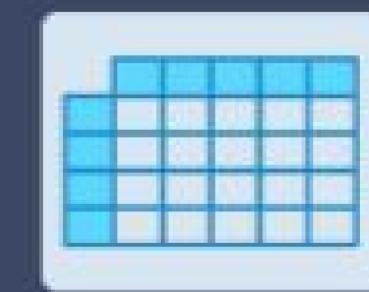
TensorFlow or PyTorch

As the underlying framework for Magenta and potentially for custom model development.



Magenta

For music generation tasks.



Scrapy or BeautifulSoup

For data collection.

THANK YOU

