

Latent Melodies: Interactive Melody Generation with MusicVAE

Nathan Katzman, Yong Zhuang

Abstract

Interactive Melody Generation is a web-based application that allows users to effortlessly create and listen to generated melodies. The app uses Magenta and MusicVAE code to transform a melody into a complete musical sequence with simple actions. Designed with the intent with the interface allowing users to experiment on the main page without having to navigate away. This project aims to make music creation more accessible to users of all levels and encourage a more interactive and engaging experience with artificial intelligence in music.

Introduction

Creating and composing music often involves knowledge of instruments or music theory, which can prevent a beginner or those without training. Even though MusicVAE offers great capability for music generation, they are not necessarily accessible for non-experts due to their technical complexity and lack of user-friendly interfaces. The project addresses the challenge of making AI-powered music generation more interactive and user-friendly. The goal is to design a web-based application that allows the user to easily generate and listen to melodies without understanding machine learning or MusicVAE. The application lets users to type in prompts or selected piano keys to define musical ideas and then use MusicVAE to generate the melody based on the input. The user can interact with the generated music directly from playing, stopping and adjusting the melody within the the single, friendly interface. By reducing the complexity of the interactions with MusicVAE and focusing on accessibility, this app lowers the barrier to create musical expression and encourage experimentation, even for users without a musical background.

Application Overview

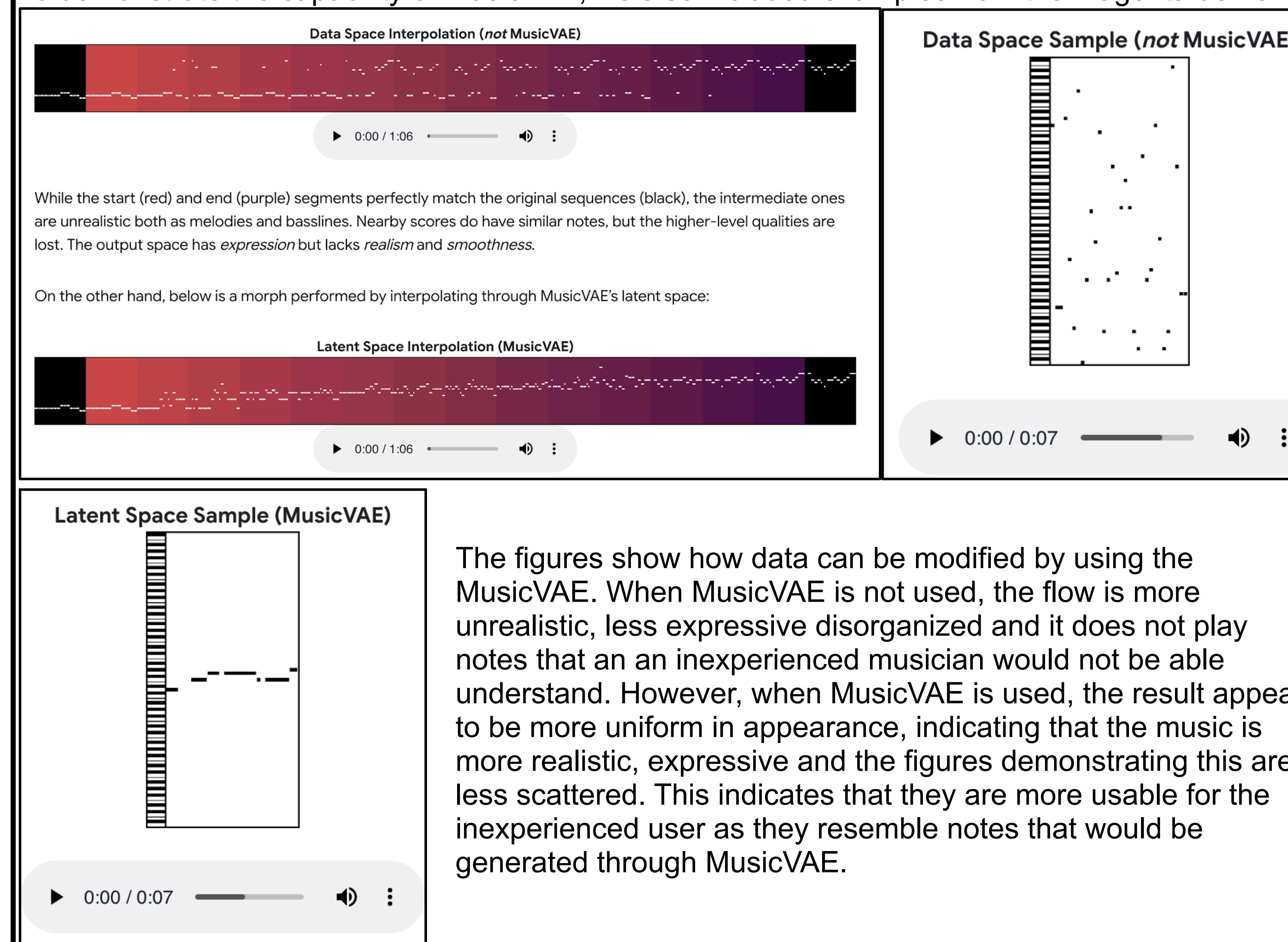
Application Overview: Interactive Melody Generator is powered by MusicVAE. The app enables new users – especially those who are new to music generation – to type a text prompt or select piano keys (A-G) and instantly generate a melody that plays within the same browser page.

Key Features: The user can interact with a web page that interacts with the interface by typing to create a prompt for the melody. The User can click buttons to Store, retrieve the melody for use, choose the piano keys, generate the melody as well as start and finish the melody. The melody is called to determine if the call worked and the last part would stop the melody after a specific timeframe. Also, The user can store and retrieve melodies without reloading the app.

The app simplifies the user experience of interacting with machine-generated music by getting rid of the need for external scripts or complex setup.

MusicVAE examples

To demonstrate the capability of MusicVAE, we also included examples from the magenta demo library:

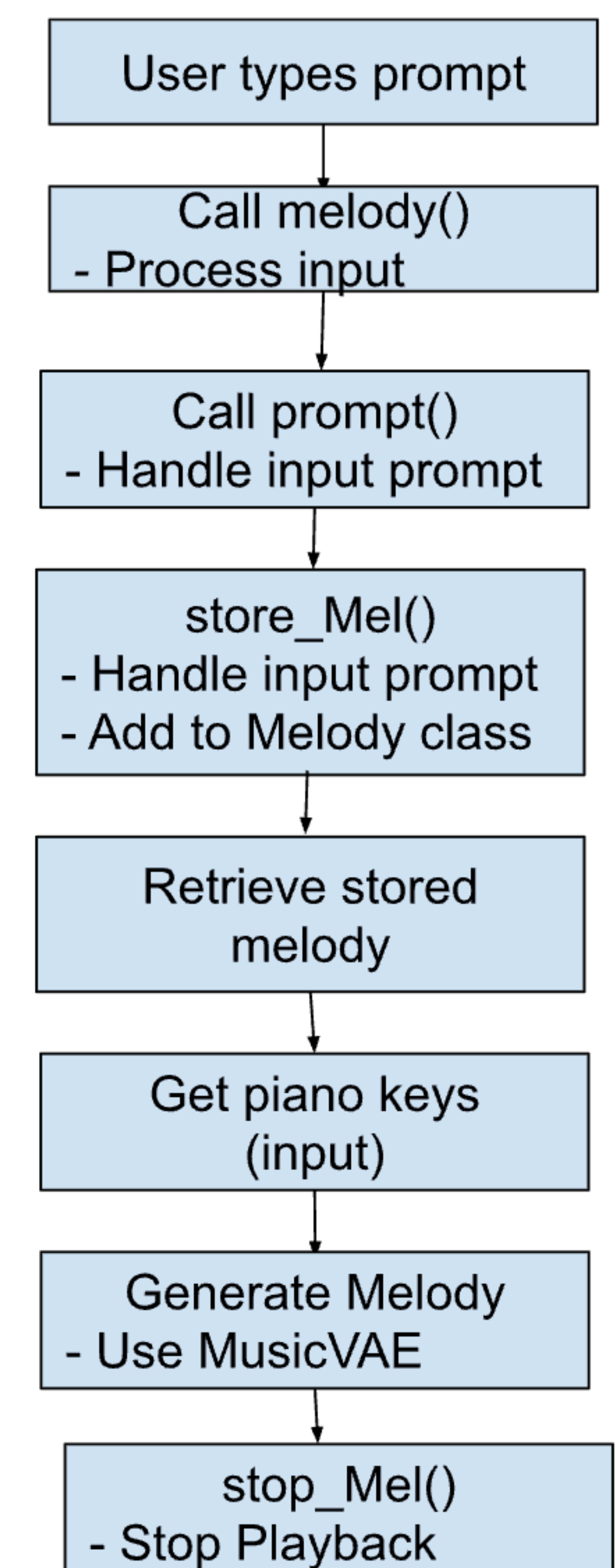


Technical Challenges/Solutions

I came across challenges when I was working on the project. When I was implementing the code, I had a problem running the code since no matter how many times I would try to fix the code, it would cause an error. I realized that it had to do with the typescript and this it was not compatible with HTML. In order to solve this issue, I had to convert the code into Javascript and run it with the HTML. I also encountered a bug with the code where it would not run when I pressed the button. The solution to this was to change the var into import/export since the javascript relied on the `_esModule` property which occurred after it was translated from typescript.

System Workflow

Below is the simplified melody generated pipeline generate in the app:



Future Work

In the future, I hope to work on more parts of the Magenta code. It would be interesting to apply what I did for MusicVAE and see if it can be done for NSynth, SketchRNN, and PianoGenie. Just like MusicVAE, each of these programs offer unique aspects that can be accessible for any user if the code is implemented. This would allow for the user to not only access melodies, but also sketches, synthesizing audio, and manipulating the keys of a piano to produce a song.

Bibliography

- <https://magenta.tensorflow.org/music-vae>
- <https://magenta.tensorflow.org/>