

Proposal

Title: Predicting Audio Sample Parameters in Serum Using Neural Networks

Problem Statement

The project aims to address the challenge of enabling music producers to accurately recreate audio samples by predicting the parameters used in the famous synthesizer, Serum. Current limitations in sound design make it difficult for producers to customize and manipulate pre-made audio samples to fit their unique artistic needs.

Context

The field of sound design and music production has advanced significantly, with platforms such as Splice, Loopmasters, ADSR Sounds, and Cymatics providing extensive libraries of samples, loops, and presets. Despite these resources, producers often struggle with the inflexibility of pre-recorded samples, which cannot be edited at the source level. This project seeks to bridge this gap by using neural networks to predict Serum parameters from audio samples, enhancing producers' creative control.

Criteria for Success

- Successful collection and preprocessing of a comprehensive dataset of Serum presets and corresponding audio samples.
- Development of a neural network model capable of accurately predicting Serum parameters from Mel Spectrograms of audio samples.
- Demonstration of the model's practical utility in accurately recreating audio samples in Serum.

Constraints within Solution Space

- Limited initial dataset size.
- Inaccessible parameters that are crucial for making predictions.

Key Data Sources

- Audio samples and parameter values from Serum presets.
- Mel Spectrograms generated from the audio samples for model training.

Deliverables

Notebooks containing:

Data Wrangling & EDA: Processes for gathering, cleaning the dataset and briefly overviewing the dataset.

Pre-Processing & Training Development: Steps for converting audio samples to Mel Spectrograms and training the neural network.

Modeling: Detailed modeling processes, including evaluation and refinement steps.

Report on the project: Comprehensive project documentation, including methodologies, results, and future directions.

Presentation on the project: A presentation summarizing the project's objectives, methodologies, results, and conclusions for stakeholders and potential users.