Rahul Peter

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Summary

Graduated in 2023 majoring in Electronics and Communications engineering. Interested in research (preferably in Music-Tech). Have a background in software engineering, signal processing and music production/composition.

Work Experience

Designation July 2023 - present

- Software Engineer @PineLabs
- Demonstrated proficiency in Python for functional testing, showcasing adaptability in utilizing programming languages to ensure software quality and reliability.
- Spearheaded the establishment of CI/CD pipelines for seamless application deployment on cloud platforms.
- Leveraged Terraform to architect and deploy cloud infrastructure from scratch.

Designation June 2021 - Jan 2023

- Freelance Musician. Session piano player and composer.
- Transcribing. Proficient in jazz and have all my major sheet work here.
- Producing and mixing/mastering music on a commercial level.
- Contributing to open-source music tools.

Projects

V/NV Detection in Speech using Variational Mode Decomposition

Developed a research-oriented project during college under Prof. **Anurag Nishad** focusing on voiced/non-voiced (V/NV) detection in speech signals. Implemented variational mode decomposition (VMD) iteratively to extract the fundamental frequency component, and used its envelope for V/NV detection. Evaluated its performance against empirical mode decomposition (EMD) and wavelet transform methods using datasets from the CMU Arctic and NOISEX-92 databases under various noise conditions. [Details]

Microtonal Audio Classification Using Machine Learning

An experiment exploring the classification of microtonal audio data using various machine learning and deep learning techniques. Leveraged `xenharmlib` to generate a diverse dataset of microtonal chords in various EDO (Equal Division of the Octave) tunings. Implemented multiple models including Convolutional Neural Networks (CNNs) combined with Time-Distributed Networks (TDNs) and Long Short-Term Memory (LSTM) networks. Benchmarked against traditional machine learning methods such as Random Forest Classifiers, both with and without hyperparameter tuning. [Code]

Audio Classification using Convolutional Neural Networks

Completed a side project as a freelance producer focusing on the classification of drum sounds using CNNs. Developed an advanced data augmentation pipeline with pitch shifting and bass boosting, extracted MFCC features, and designed a CNN to classify drum samples (kick, snare, clap, hihat). Achieved high accuracy, demonstrating effective model performance on a diverse dataset. [Code]

Negative Harmony Generator Plugin: Crafted a plugin for generating negative harmony in MuseScore, offering users a tool to explore harmonic transformations. Leveraged QML for seamless integration with MuseScore's interface. [Github].
Microtonal Tuning Plugin: Developed a plugin enabling microtonal tuning of notes in MuseScore, utilizing just intonated ratios for precise pitch adjustments. Facilitated direct insertion of microtonal intervals into musical compositions. [Github].

Education

2019 - 2023 B.E (ECE) at **Bits Pilani, K.K. Birla Goa Campus** (Grade: 8.14)

Skills

Music Related	Composing, mixing, mastering, transcribing, piano
Tech Related	Programming, Signal Processing, MATLAB, Python