Preface

Music holds a significant place in our daily lives, and instrument classification plays a crucial role in extracting valuable information from musical content. This information can further contribute to tasks such as music classification by genre and music search by instrument. Both music listeners and performers often encounter the need to identify the specific types of instruments used in a song and their respective timing of play.

Instrument classification offers benefits not only to individuals learning musical instruments but also holds broader implications for organizing musical audio clips based on instruments. By accurately identifying the instruments present in a piece of music, it becomes possible to create comprehensive catalogs or databases that enable efficient searching and organization of music based on instrument-specific criteria.

In this project, we present the implementation and performance evaluation of a neural network-based instrument detection system. The system is designed to analyze audio clips and identify the musical instruments present within them. By leveraging the capabilities of neural networks, the model can learn patterns and features indicative of different instruments, allowing for accurate instrument recognition.

The successful implementation of this instrument detection system has the potential to empower music enthusiasts, learners, and professionals alike. It facilitates instrument identification in audio recordings, enabling users to gain insights into the composition and arrangement of music. Furthermore, this technology opens up possibilities for advanced applications, such as automated instrument recognition systems in music production, real-time instrument identification in live performances, and improved music recommendation systems that consider instrument preferences.

Overall, instrument classification using neural networks presents an exciting avenue for exploring and harnessing the valuable information embedded within musical audio clips, paving the way for enhanced music-related experiences and applications.

In our study, we specifically concentrate on the classification of audio streams into various instrument classes, including "Cello," "Flute," "Oboe," "Saxophone", "Trumpet", "Viola". We aim to assess their effectiveness in accurately identifying and classifying different musical instruments within audio streams. Deep learning models have shown great potential in capturing intricate patterns and representations from audio data, making them well-suited for instrument classification tasks.