

Symphony Sense

AIM

Symphony Sense aims to develop a robust machine learning model capable of accurately classifying various musical instruments based on audio features. By leveraging advanced techniques in audio analysis, the project aims to enhance automated music analysis systems and thus providing a valuable tool for music production, education, and research.

MOTIVATION

AI-driven instrument recognition can revolutionize music production, education, and analysis. This project leverages machine learning to improve accuracy and efficiency in identifying musical instruments, advancing the field of music technology.

Workflow of Symphony Sense

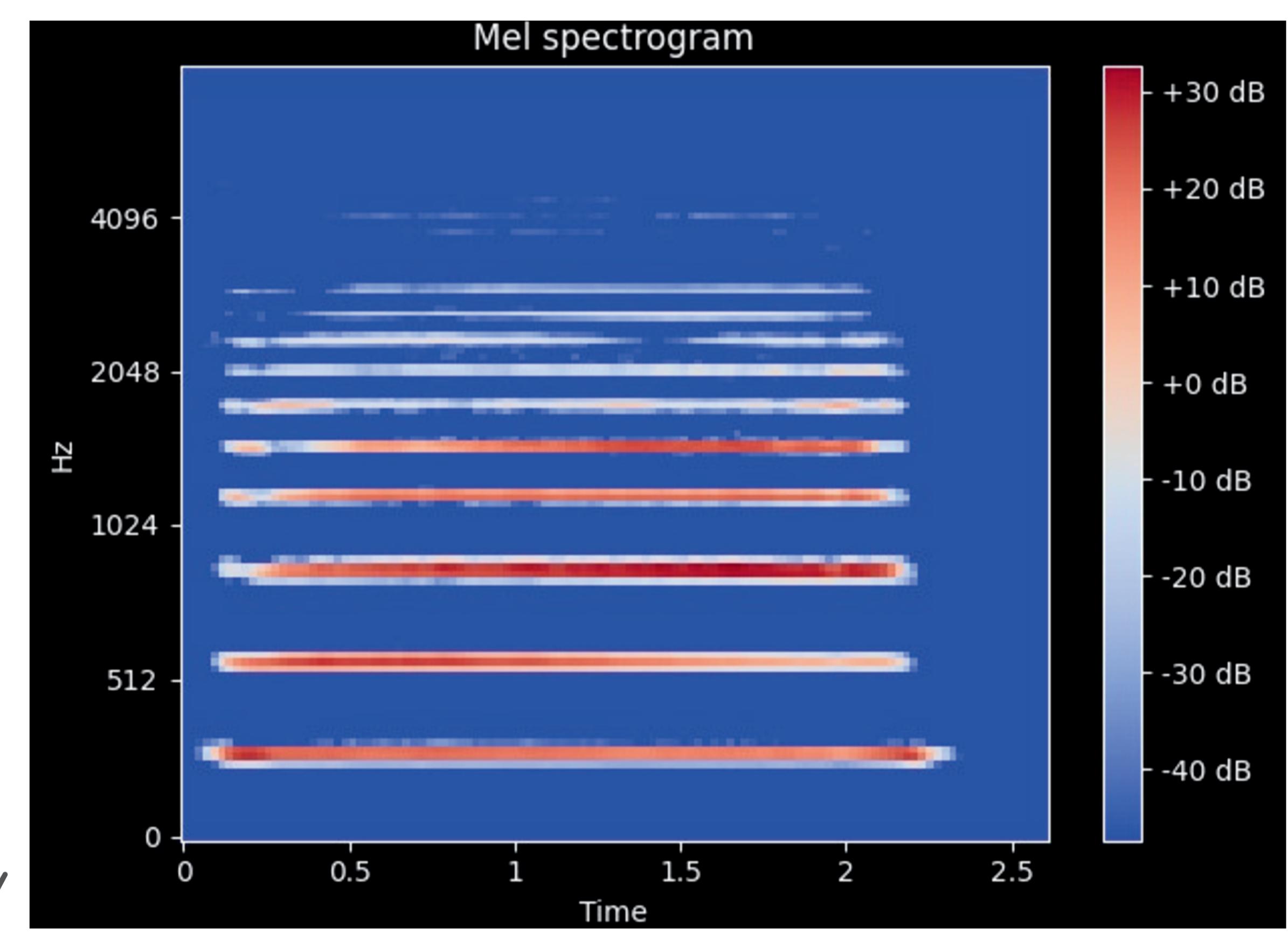
DATA COLLECTION

Solo instrumental audio files were sourced from the internet to create a custom dataset for neural network training and testing. Scan the QR code to view a sample of violin data.



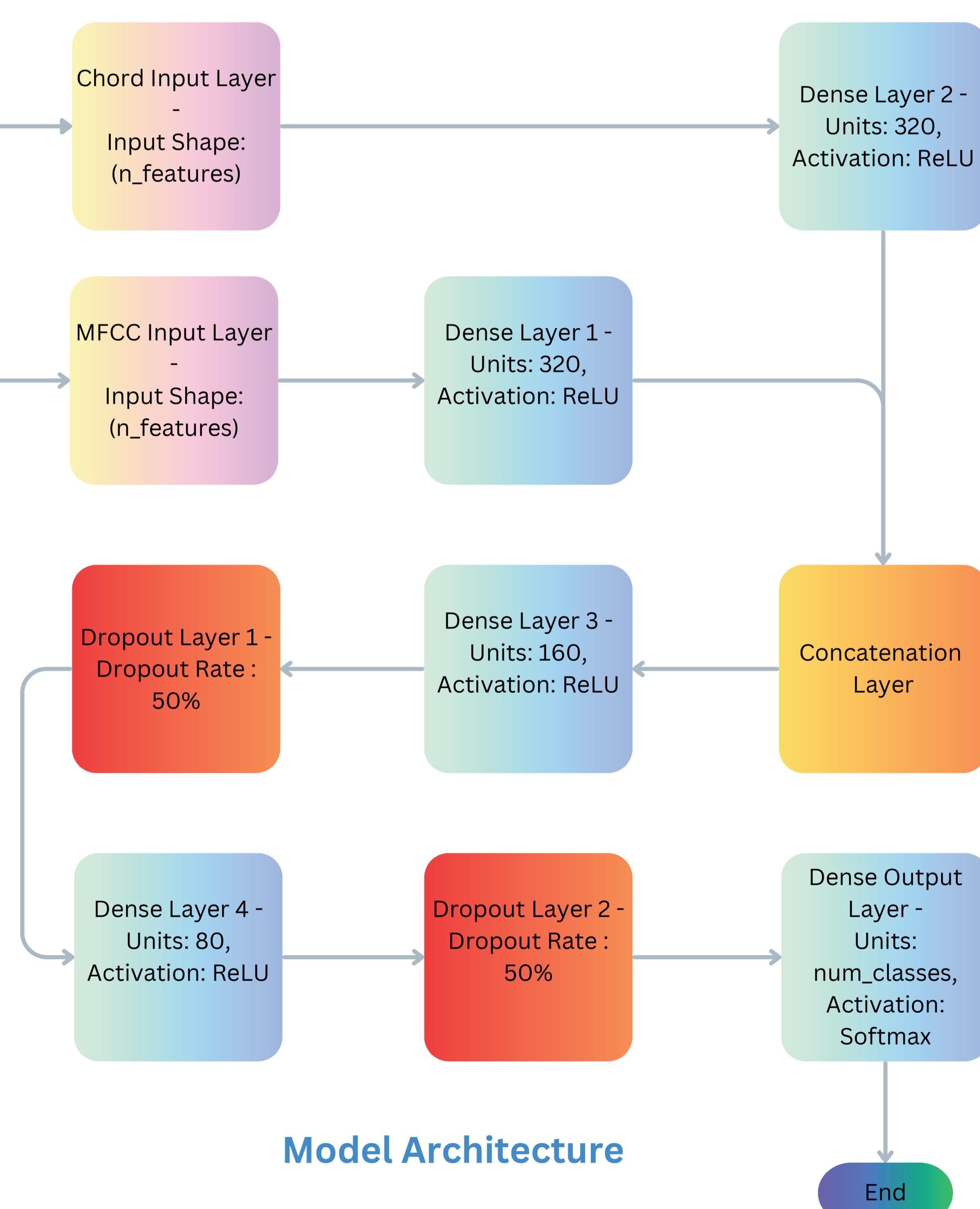
FEATURE EXTRACTION

Extracted key audio features, including Mel-Frequency Cepstral Coefficients (MFCCs), to capture the timbral characteristics essential for instrument recognition. The Mel spectrogram visually represents these features.



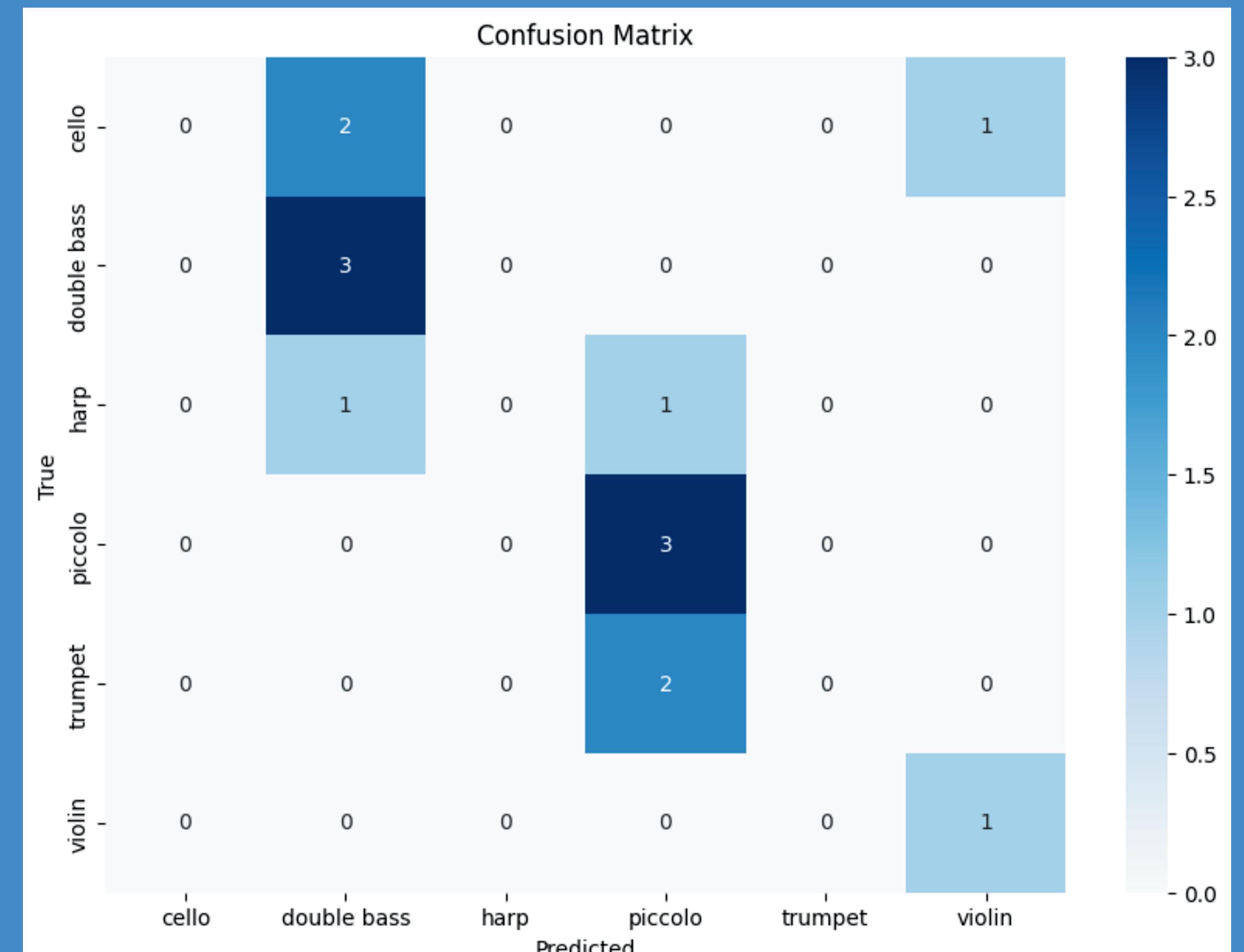
MODEL TRAINING

Trained a custom neural network using TensorFlow, optimizing for accurate instrument classification by processing MFCC and chord data.



INSTRUMENT RECOGNITION

Achieved decent accuracy in identifying various musical instruments, demonstrating the model's effectiveness in real-time audio analysis.



CONCLUSION

Symphony Sense demonstrates the feasibility of using AI for musical instrument recognition, achieving an accuracy of 50%. While this accuracy is a promising start, it also highlights the complexities involved in audio classification tasks. The project has provided valuable insights into feature extraction and neural network design for music analysis.

FUTURE SCOPE

Future improvements will focus on enhancing accuracy, expanding the dataset, and extending the model's capabilities to live audio detection.

REFERENCES

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