Music Recognition Using Convolutional Neural Networks

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Motivation

- The need for a application which combines neural networks with the arts domain.
- The need for an interactive way to visualise an application based on convolutional neural networks.
- A mean to integrate 3D Models into user friendly applications.

Personal contributions

- The implementation approach of the neural network framework
- Simplifying the user interaction with the trained model based on the aforemetioned framework.
- Providing of a simplistic interface to visualize and classify a song based on its YouTube link
- Making the application more user friendly by incorporating two 3D animations in order to enhance the visual experience.

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Application architecture

The application is divided into three parts:

- The Neuronal Network Engine
- The User Input Handling and Processing
- The Application-User interaction via the GUI

The application architecture is illustrated in the below figure:

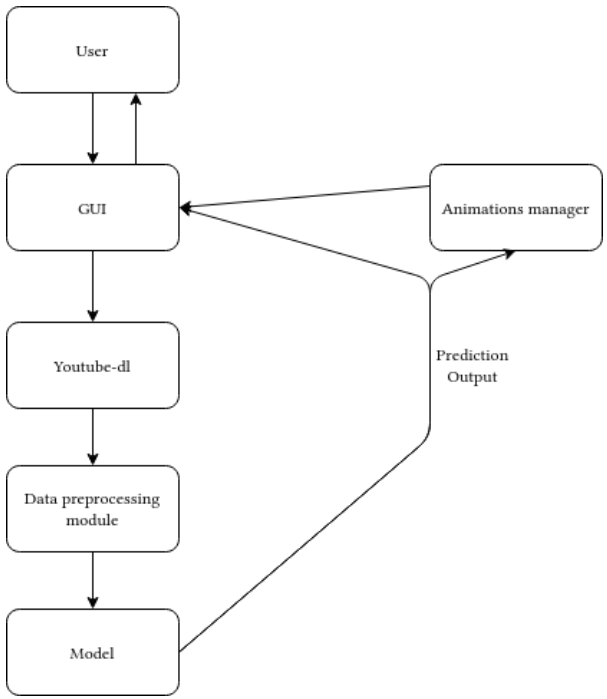

Figure: Application architecture

Demo

Possible improvements

- Implementing more classes in order to represent multiple instruments.
- Designing and adding more 3D animations.
- Implemetinging GPU support for numeric operations.

Conclusions

- The application succeeds in creating a middle way between art and computer science.
- The application provides a complex and comprehensive artificial intelligence background.
- The application corresponds with the initial ambitions of the project.

Bibliography

- Harrison Kinsley and Daniel Kukieła. Neural Networks from Scratch in Python. 2020.
- Seth Adams. “Audio Classification”. In: (2020).
- Erik Lindernoren. “Machine Learning From Scratch”. In: (2019).