Deep Learning Project Proposal – Group 1

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Project Topic:

We have selected the problem of classical music generation using recurrent neural networks because of our interest in exploring the predictability of classical music patterns and the possibility of generating authentic classical compositions that are indistinguishable to the human ear.

Data source:

We will use a dataset of classical music compositions in MIDI format available here (link). The dataset contains information about musical notes, timing, and other musical elements. We believe that is will be large enough to train a deep network, as it includes compositions from various composers of the classical era.

Deep Network:

We plan to use RNN networks, specifically a Long Short-Term Memory (LSTM) network. LSTMs are well-suited for learning sequential data and can capture long-term dependencies in the music data, which is crucial for generating coherent musical compositions.

Framework:

We will implement the LSTM network using TensorFlow. The reason for this is due to its ease of use, as well as familiarity for us, given we have worked with TensorFlow quite recently.

Reference Materials:

We will use a combination of research papers, online demos, and GitHub repositories, to obtain sufficient background required to tackle this problem.

Performance Evaluation:

We will judge the performance of the LSTM network based on its ability to generate coherent and musically pleasing sequences of notes. This will be mostly subjective. Additionally, we will explore the use of metrics such as note accuracy, melody coherence, and harmonic consistency to evaluate the generated music.

Project Schedule:

- Week 1: Data preprocessing and feature extraction from the MIDI dataset.
- Week 2-3: Designing and training the LSTM network architecture.
- Week 4: Model Evaluation and fine-tuning hyperparameters
- Week 5: Finalizing project report.

This is the rough schedule we have in mind.