

Proposal for Senior Honors Thesis

HONS 497 Senior Honors Thesis Credits 2 (2 minimum required)

Directions: Please return signed proposal to the Honors Office at least one week prior to your scheduled meeting with the Honors Council. This proposal must be accepted by Honors Council the semester before presentation.

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Primary Advisor: Dr. Rodney Summerscales

Secondary Advisor:

Thesis Title: Finding an Embedding for Music Auto-Complete: An LSTM Approach

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Expected date of Graduation: December 2020

I. Provide goals and brief description of your project or research.

Deep Neural Networks have been transformational to the field of Artificial Intelligence and Machine Learning. Of the foundational theories and architectures were reintroduced in the late 20th century, it was not until 2006 that Neural Networks that breakthroughs began that led to the current state-of-the-art (Liu, Weibo, et al 2017). Neural Networks were transformational particularly in the field of Computer Vision by Convolutional Neural Networks (CNNs), as well as many Unsupervised Learning tasks. They have also seen success in their ability to model sequential data by Recurrent Neural Networks (RNNs). Models have been created to handle the task of Text and Query Auto-complete, as well as Text Generation and have seen great success (Mirow 2015 & Pawade 2017). In further research into sequence generation and completion, RNN architectures have been applied to the problem of Music Generation with many seeing success in generating polyphonic music (Johnson, 2017). While much work and attention has been given to the problem of Music Generation, little to no work has been done on Music Auto-complete. This project seeks to introduce Music Auto-complete as a new problem, while adding to the body of knowledge on how Neural Networks process

LSTM-RNN architecture. Success will be measured quantitatively by using the top 5 next suggested notes or chords and checking whether or not the correct note in any one of the restricted nine compositions appeared in the predictions.

The LSTM-RNN model will be created using python and the Keras fr





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