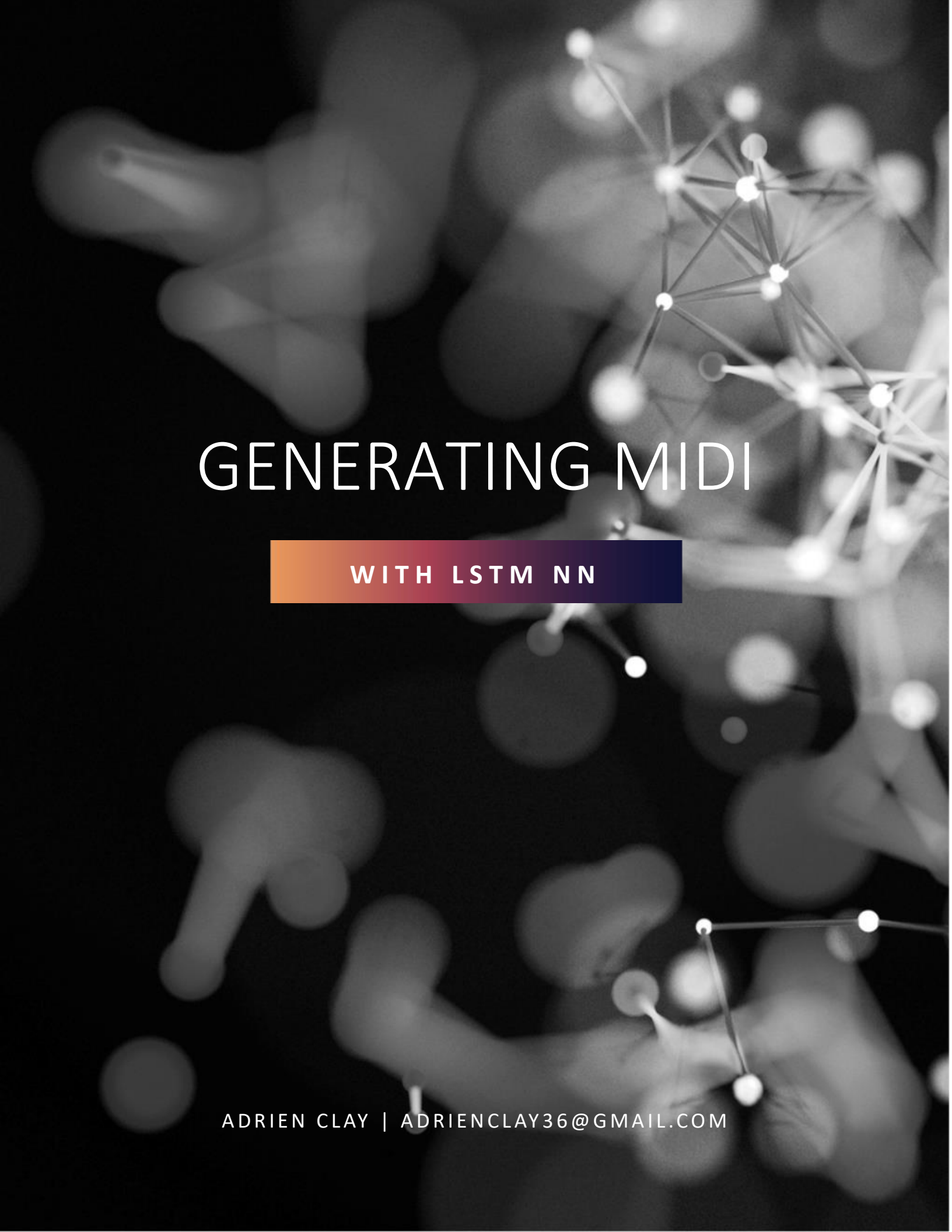

GENERATING MIDI

WITH LSTM NN

ADRIEN CLAY | ADRIENCLAY36@GMAIL.COM

SUMMARY

The concept of generating music has applications across multiple disciplines. On one hand, it is an area of research within AI and machine learning that researchers are aiming to perfect. Another area that this becomes useful is in the realm of music composition itself. MIDI is a form of music data that represents pitch, velocity. The benefit to midi is that is stored in a smaller data size than audio files and can be used universally across a range of musical VST's (plug-ins) and can be manipulated easily by key, tempo (BPM) and dynamics.

I will attempt to design a rudimentary version of a MIDI generation plug-in that will allow a user to generate MIDI through AI.

INTRODUCTION

CONTEXT

There are few resources available for composers that allow them to generate MIDI files for use in music that do not rely on a purely random algorithm with constraints such as key, mode, etc.

It would be interesting to see if it would be possible to train an LSTM neural network to generate midi based on user input. While the output may not be perfect, it could certainly be modified, and used a source of inspiration in a composer's workflow.

DATA SOURCES

A large dataset containing MIDI will be necessary to train a model to produce use-able results. Being a composer myself I have access to a massive range of MIDI files on my own machine, as well as those across the internet from websites like Kaggle.

CONSTRAINTS

The model may end up being relegated to a single style of music. While the larger picture boasts a plug in that could range across styles, and help a user generate music that suits an individual project they're working on, the rudimentary version will likely be far less robust than the idealized version.

GOALS

PRIORITIES

- Good Music
- Deployable Model

ADDED PRIORITIES

- Possibility for future deployment in different formats (VST, AU etc.)
- If relegated to a single style, hash out the desired target audience

BUILD

Build a model that adequately outputs a stream of use-able midi for a music composers' workflow.

DEPLOY

Deploy the model as a standalone web-app, with the larger idea being centered around VST deployment for DAW use.

SHARE

Depending on the efficacy of the model, share the plug-in with music composers around the internet to see if it could be a realistic, useful tool to aid in the composition of music.

DELIVERABLES

JUPYTER/CODE

Jupyter notebooks that detail data collection, data preprocessing, model building, training, and evaluation.

BACKEND

A functional backend that can take user-input and produce a MIDI file for use by the end user.

FRONT END

A front-end GUI to give the back-end universal useability, and maybe some great aesthetics too!