# Contents

# 1   GENERATING A DRUM RHYTHM

## 1.1   Initial thought

- maybe we can do some sort of hierarchical structure to handle different level of patterns (like general pattern against specific decoration pattern)

- ESN or LSTM ? maybe it's better to go for the ESN, simply because the LSTM's methods for generating music have been already explored

## 1.2   Papers

- ./LSTM-generation-of-music.pdf this paper show how to build an LSTM network to generate classical music (piano)

- ./2561$_{\text{Ivanchev2013.pdf}}$ this paper used ESN for pattern generation in robotics (maybe it could be useful to look at how they design the network, etc)

- ./anticipation-RNN.pdf this paper introduce a "new" type of RNN architecture which generate music given some kind of "style" constraint. (can be useful for some inspiration on the structure of our NN)

- ./functional-taxonomy-of-music-gen-sys.pdf quite general paper about music generation. (the main point here can be how to measure performance)

- ./LSTM-music-generation-2020.pdf this paper show how to use LSTM to generate music, it tries different kind of RNN.(look at loss function and architecture)

- ./PracticalESN.pdf an introduction on how to use and apply Echo State Network (seems quite useful)

- ./ESN-levenberg-for-chaotic-time-series-prediction.pdf ./ESN-levenberg-new-method.pdf these papers illustrate a different technique to learn the output weights which instead of using a simple linear regression uses the Levenberg-Marquardt algorithm, it seems quite complicated math for now so maybe it's better to go through when we have more knowledge.

- ./ESN-opt-binary-grey-wolf.pdf this paper illustrate an hybrid ESN network called BGWO-ESN which is based on the Grey wolf optimization algorithm, it also compare this GWO to other evolutionary algorithm like GA(genetic algorithm). it shows that this new hybrid network has better results compared to standard ESN and GA-ESN on financial prediction. (it seems interesting)

- ./ESNTutorialRev.pdf just a tutorial on RNN by Jaeger.

- ./ESN-universal.pdf a proof of the universality of the ESN.

- ./hierarchicalesn$_{\text{techrep10.pdf}}$ an example of how to do hierarchical ESN by Jaeger. we can get some ideas from there if we go for an hierarchical architecture.

- ./ESN-music-by-prediction.pdf the bachelor thesis on nestor about ESN and music generation. I didnt read it but it seems useful.