

A GAN Based Drum Pattern Generation UI Prototype

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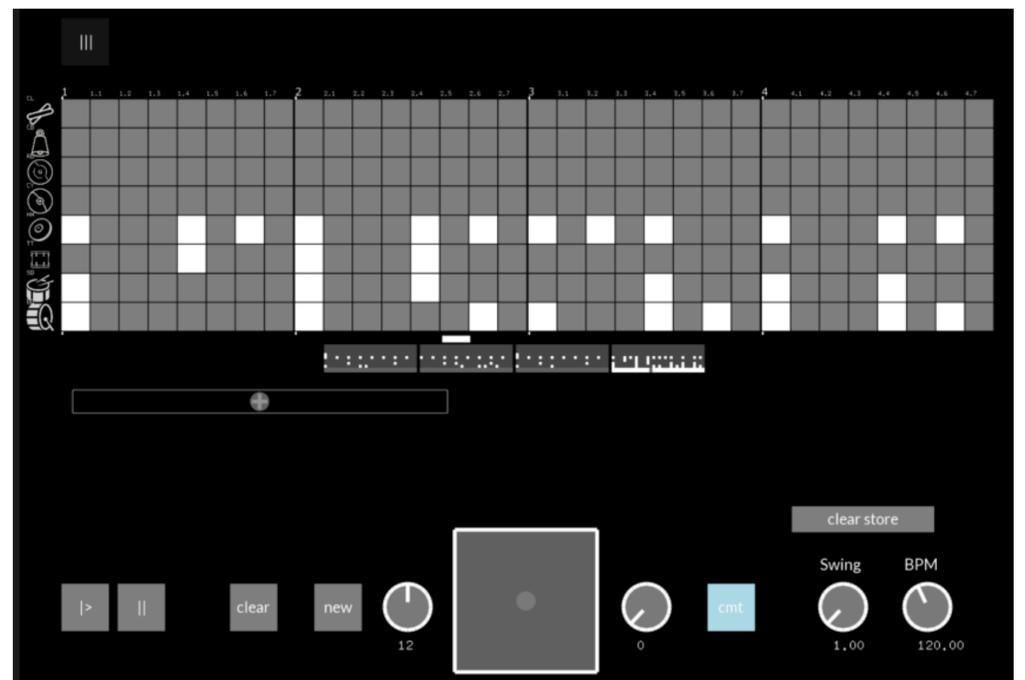
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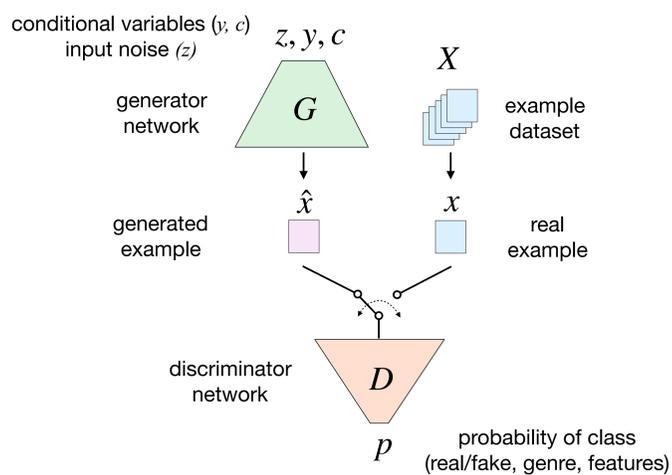
user interface



1 introduction

- > digitally created drum tracks are commonly used in modern music production environments
- > drum patterns are either manually created or predefined patterns from a pattern library are used
- > manual composition is a labor intensive task but often the preferred method to ensure originality
- > in this work a prototype to assist the artist in the workflow for this task is introduced
- > a major goal is to make the process more fun and spark creativity

GAN training



2 prototype

- > the user interface is touch screen based, for easy interaction
- > a drum step sequencer located in the upper part is used to visualize and edit drum patterns
- > a central x/y pad in the bottom part controls complexity (y) and intensity (x) of the generated patterns, while the left knob allows to select a genre
- > the knob right to the pad allows to scroll through generated patterns
- > controls for playback, as well as for tempo and swing are located to the very left and right in the control area
- > MIDI output and *Ableton Link* support allow for easy integration and synchronization with DAWs

3 variation algorithm

- > as pattern creation engine, the generator of a GAN is used
- > the network architecture for both generator and discriminator uses a convolutional recurrent layout
- > convolutions are used to model patterns within one bar while the recurrent layers allow to model a varying number of bars
- > the GAN is trained on a large scale data set featuring genre annotations and calculated complexity and intensity features
- > the dataset consists of drum patterns transcribed from the GiantSteps dataset³ and patterns extracted from a MIDI dataset⁴

4 future work

- > improve GAN training and UI
- > objective evaluation of generated patterns
- > user study to evaluate prototype