

Simple Multi-track Loop Sequencer for Minimal Music Using a Standard Gamepad

Daiki Kobayashi Yasuo Kuhara
Department of Media Art, Tokyo Polytechnic University
1583 Iiyama Atsugi Kanagawa Japan 243-0297
+81 46 242 4111

m0724044@st.t-kougei.ac.jp

kuha@media.t-kougei.ac.jp

ABSTRACT

We developed a multi-track loop sequencer, which generates minimal music using a standard gamepad. This sequencer has multiple melody parts of an analog software synthesizer and a drum part. A player can play minimal music of short reiterative loops with a simple operation using some buttons and analog handles on the gamepad. For a novice who has no experience of playing a musical instrument, it is easy to learn how to play instantly and enjoy performing music with intuitive operation like a video game. Our system is used for musical instruments for live performance and interactive music entertainment.

Keywords

Gamepad, Minimal music, Dual analog handles, PlayStation, synth1, Musical performance, Analog software synthesizer.

1. INTRODUCTION

Various musical video games such as Namco's Taiko Drum Master, Sega's Samba de Amigo, Konami's Guitar Freaks and Nintendo's Wii Music have been developed because of the requirement to play music with instruments. However, with these games, a player cannot perform their own music, but passively operates the controllers according to preloaded music. On the other hand, some portable synthesizers such as Korg's Kaossilator or Nintendo DS's DS-10 are developed for musical performance. However, a player needs a lot of time to learn their operations because of the difficult interfaces. Therefore, there are many precedents [1] [2] in the NIME community related to investigating controllers oriented towards musical experience.

In this paper, we proposed a simple loop sequencer using a standard gamepad, which is familiar to those who have experience of playing popular video games. A standard gamepad has a simple interface with some buttons and analog sticks designed for operating various game scenes. Accordingly, we think that it is useful for a novice for composing and performing music easily. We aimed to develop a software sequencer suitable for musical performance with a gamepad that is able to generate attractive music while keeping the operation simple, which makes it possible for everyone to enjoy performing music.

2. METHOD

2.1 System Configuration

Our system is simply configured on a PC connected to a gamepad through a USB port, and programmed by Max/MSP software. As a gamepad, we use a standard device, Sony's PlayStation dual analog controller, which has a four-direction

D-pad, four action buttons (square, triangle, circle, and X), four shoulder buttons (R1, R2, L1, and L2, standing for right and left), and dual analog handles (see Figure 1). As a sound generator, we use the analog software synthesizer known as synth1 [3], which is a free VST instrument simulating the Clavia Nord Lead 2 synthesizer [4]. You can use any other VST instruments to generate sound.

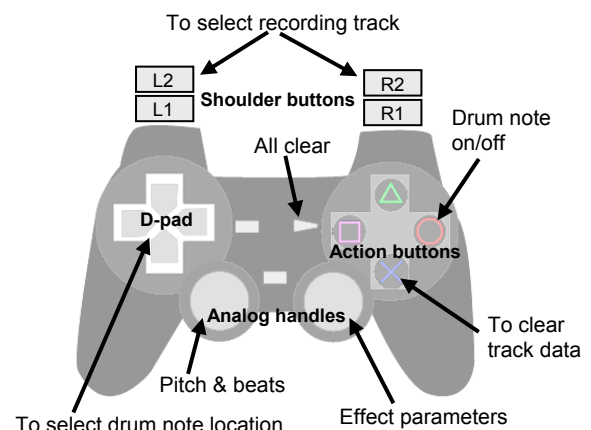


Figure 1. Gamepad and functions.

Our system consists of two musical parts, which are melodies and drums. The melody part, which is generated by an analog synthesizer, initially has four tracks, which are the lead synthesizer, bass, middle tone pad synthesizer, and high tone pad synthesizer. The tracks can be added and assigned any instruments of synth1. The drum part has four percussive instruments, which are initially kick, snare, open hi-hat, and closed hi-hat. They can be assigned other percussive sounds.

2.2 Performance

Our system is designed as a loop sequencer for minimal music and can repeatedly perform a short loop of one bar's duration, which is two seconds because the initial value of BMP (beats per minute) is 120. A player can change the loop duration by changing the BMP value. A player can record multi-track loop sequences of the melody part in buffers of the PC, and input drum notes in the matrix control object of the Max patch. The stored melody and drum sequences are performed automatically and repeatedly in the same clock. Consequently, our system composes minimal music such as musical reiteration of loops. Some demonstration movies are shown on our website [5].

2.2.1 Melody part

Initially, the melody part has no data. At first, a player specifies a track using one of the shoulder buttons, which are R1, R2, L1,

and L2 standing for track 1, track 2, track 3, and track 4. While holding down the button, for example R1, a player operates dual analog handles to generate melodies. In real time, the performed music is recorded as a loop sequence of track 1 in the buffer of the PC and continues to be performed repeatedly. If the track has already stored loop data, these are overwritten by the newly recorded loop. Pushing the X button clears the buffer. In the same way, the other tracks are performed and recorded.

The dual analog handles can move in the two-dimensional plane of the horizontal and the vertical direction and a player can therefore control two parameters by each handle (see Figure 2). The left-hand analog handle controls the pitch in the horizontal direction and a beat in the vertical direction. If a player bends the handle to the right, a higher note is generated. The pitches are assigned in a specific musical scale, which is initially F major, and the generated melody therefore sounds harmonious. If a player bends to the upper side, notes are generated at quick intervals, for example 2, 4, 8, 16, and 32 beats. The right-hand analog handle controls two effect parameters, which are initially the resonance and the cut-off frequency of the low-pass filter. A player can change the tone color using the right-hand handle.

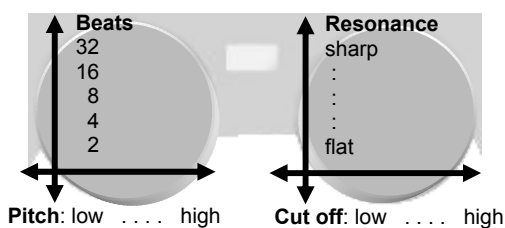


Figure 2. Dual analog handles controlling parameters.

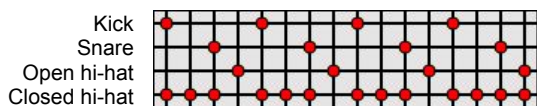


Figure 3. Matrix control of the drum part.

2.2.2 Drum part

For the drum part, we use a 4x16 matrix control object of the Max patch (see Figure 3). The drum part has four instruments and an interval of 16 beats divided in a bar. Initially, we assigned kick, snare, open hi-hat, and closed hi-hat. A player can move the cursor in the lattice of the matrix using the D-pad and toggle note on/off using the circle action button.

3. EVALUATION

In our system, a player can perform music using simple operation. To perform, a player needs only two steps. The first step is selecting the target, for example, the track for performing or the location of the drum notes. The second step is the action of performing music, for example, making melodies or drum notes (see Figure 4). In fact, those who use our system for the first time can perform music by receiving a short briefing and conducting some trials in a few minutes.

Additionally, our system has optional extensions for various music performances. Using the default setting, we can perform interesting minimal music by simple operations. However, for an upper-level player, our system can extend various musical elements to more attractive expression. For example, we can vary the instruments for melodies and drums, number of tracks, musical scale of generated melodies, sound effects, BPM value, etc. Using these optional functions, a player can develop musical expression and perform unique music.

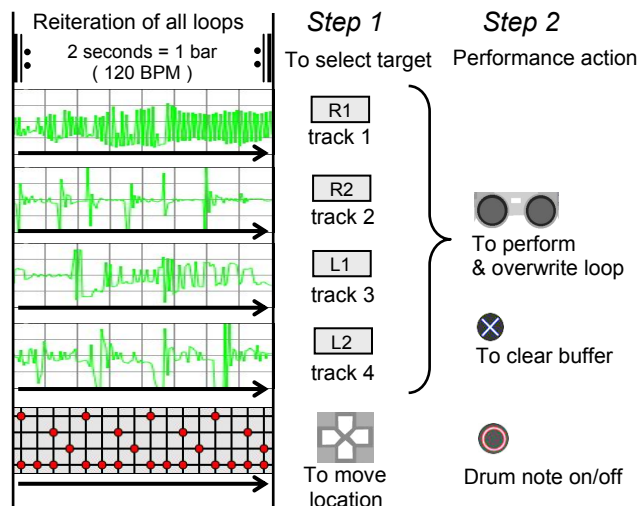


Figure 4. Diagram of operation for performance.

4. CONCLUSION

We developed a simple loop sequencer for minimal music using a standard gamepad used extensively in video games such as PlayStation. Using this system, people who do not have musical skill can perform interesting music for a short time. At present, this system can generate only minimal music of one bar's reiteration. In the near future, we will improve this system so that more progressive music can be performed while keeping the operation of the standard gamepad simple.

5. REFERENCES

- [1] Blaine, T. The Convergence of Alternate Controllers and Musical Interfaces in Interactive Entertainment. In *Proceedings of the 2005 International Conference on New Interfaces for Musical Expression (NIME05)*, Vancouver, Canada. 2005, 27-33.
- [2] Endo, A. and Kuhara, Y. Rhythmic Instruments Ensemble Simulator Generating Animation Movies Using Bluetooth Game Controller. In *Proceedings of the 2008 International Conference on New Interfaces for Musical Expression (NIME08)*, Genova, Italy. 2008, 345-346.
- [3] <http://www.geocities.jp/daichi1969/softsynth/>
- [4] <http://www.nordkeyboards.com/>
- [5] <http://www.media.t.kougei.ac.jp/lpsqr/>