

Assignment # 4

Question 1: Tangible music interfaces - Summary of 3 Categories:

a) Tangible Musical Artifacts.

These are very varied objects that change the sound depending on the user interactions with them. They are interesting in that they act as normal life objects - bottles, blenders, rubik's cubes etc. The interactions are very natural. They are different because they are less compartmentalized than other tangibles - small number of objects are needed to create the sounds. The interactions are very unusual. Three called my attention in particular. The audio shaker captures sound and then changes the sound depending on the movement of the shaker - treating the sound as if it were a 'liquid' affected by gravity. Another example are music bottles, which allow the sounds to be audible if they are 'uncorked'. A 'blender' detects what 'fruits' (which are digitally tagged) were put into it, and generates sound based on this.

b) Token Based Sequencers

These seem to mostly be sequencers that play sounds (musical notes/drum samples) depending on the placement of bearings/tokens in a base (ranging from metal balls to M&M's). The position of the bearings changes the pattern. The interfaces are designed to be very intuitive. Nowadays, drum machines/ pattern creators are common in Digital Audio Workstations. What is interesting about these tangibles is that the interactions are very different. Besides just having an on/off for each note in the patterns, other forms of control are available: sliders for volume, timbre and rhythm of notes. Some tokens/bearings are different from others and can make the sequences more complex. Different sensors are used to determine the activation of patterns. Some of these are able to be connected with software. This changes the way music is created, because users are controlling music with more 'natural' / 'physical' actions.

c) Musical Toys

These tangibles incorporate many characteristics of the other tangibles. Parameters of sound are controlled by very simple objects - blocks and switches. Their design makes them seem accessible for younger users. They give a lot of power to the users. They are designed to be very simple for users, such as a child could control it. I believe this has great potential, given that if children learn how to use these tangibles, they might become familiarized with the interactions, and create more expectation for this kind of technology in the future.

Read on for Question 2.

Question 2: Proposition of a tangible interface using MIR tasks.

Idea 1:

We have studied about the fourier transform and how sinusoids of different frequencies at different phases combined make up a sound. An interface could be created using an artifact that picks up a sound and obtains the frequencies and phases for the sound, and then picks the ten greatest peaks to resynthesize the sound. Then a series of tokens can be disposed in a pattern, and they would play a melody/sequence using the synthesized sound. This could be particularly strange, since the sounds being captured would not necessarily be musical in nature.

Idea 2:

Create a series of artifacts that capture and 'recreate' the beats and tempos of patterns clapped to them (using beat extraction and tempo extraction techniques learned in class). The artifacts can be used as tokens afterwards, and placed on a surface to generate more complex rhythms. The horizontal position of the artifacts would dictate timewise when the stored patterns would play. The vertical position of the artifacts could control what drum sound sample to play (a kick, snare or hi-hat, etc).

Perhaps even instead of the user managing everything, the system could automatically rearrange the tokens in the surface to generate an appropriate pattern. It would be nice if it could be connected to recording software.

This kind of beat creation contrasts with what is normally used in a DAW, because it would be faster. Usually in a DAW, MIDI patterns must be manipulated meticulously to generate the beat.

