

Music Technology Project Proposal: Garry Hall s1035202

Brief Description of the Proposed Project.

Chiptune (or 8-bit) music is when composers and performers use the sounds created by retro video games to produce a form of modern music. There are, of course, software and samples available to download that could simulate these sounds, but it's also possible to hack into the sound board on video game consoles and to play sounds coming directly from the device. For my project I would like to explore this type of music, leading to a better understanding of its various forms and also what hacking such consoles entails. After spending time learning about electronics I will be able to fulfil the purpose of my project, that is, to utilise skills new to me in order to create my own musical composition.

I already own multiple old games consoles that I am prepared to open up and attempt to hack. If this is successful I can begin to consider using them for some kind of performance. There is the possibility of using a midi controller or Max/MSP to control the sounds, or even to invent a composing tool that would allow you to both write and playback the music.

Outcomes

The main outcome of this project will be the completed composition of a piece of music. This could be either recorded or performed live. This decision will depend on the nature of the machines I have built and the practicality and implications of a live performance. Naturally, it makes sense to wait and judge these closer to the time.

Furthermore, I hope to have listened to and experimented with a wide variety of pieces within this genre of music. Expanding my own musical knowledge in this field (and, indeed in any field) will enable me in understanding it better, thereby aiding me in establishing my own style.

By the end of the project I will have learned more about electronics, not just in terms of hardware hacking and repurposing old machines but also more generally: what do circuit boards consist of? How can these be modified? Both queries will have been answered by the conclusion of this project.

One final outcome would be the growth of my personal ability to work and set goals by myself. A strengthened ability to plan in such a way would be good practice for undertaking any sort of project in the future.

Context

In recent years many artists and bands have incorporated Chiptune into their music. So far I am only aware of a small number of these but I hope to have increased my knowledge by the end of the project. Examples include the "Game Boy Orchestra", who have recreated Bach's Toccata and Fugue in D Minor using Game Boys. "Pixelh8" is a British composer that writes and composes new music exclusively using 8-bit sounds. In addition, he has written software for many different handheld consoles. The Polish group "Mikro Orchestra" also create original music and perform live using multiple consoles and hardware. The Electro-pop group "Tree Wave" combine electronic and chip tune sounds with visuals for their live performance. Other bands such as "Anamanaguchi" or "The Guitar Zeros" use Chiptune fused with rock music.

Repurposing, or reappropriating in this way is not entirely dissimilar from sampling and allusion that has been an active part of music for centuries. We borrow from older technology in order to aid us in creating something new. When such video games were first invented, the sound cards and the music and noises coming from the machines were primitive and restrictive. Moreover, better quality synthesisers did exist, yet

the designs for these consoles were most likely deliberately crude, in order to save money. It is perhaps a little poetic that these sounds were at the time thought of as second-rate, and yet now they are often considered desirable and "retro".

Appropriate Literature

There are a few main texts that I will use for this project. "Handmade Electronics" by Nicholas Collins will enable me to study the basics of hardware hacking. "Circuit Bending" by Reed Ghazala will also be similar practical study material. For a more general look at electronics, "Getting Started with Electronics" by Forest M. Mims III is another useful resource.

Preliminary Research:

Preliminary Research will involve a lot of reading about not only hardware hacking, but also generally about electronics. I will spend time searching for and reading articles and blogs about people who have undertaken similar projects and how they have managed to achieve their goals. I will also watch video tutorials and any other online sources I can find. I will listen to many different styles of the Chiptune music genre, perhaps finding a style that I appreciate and discovering what, in my opinion, works well and what doesn't. I will spend time learning about the Chiptune community - why it exists, how it started – all of these things are relevant. I will also have to spend the first few weeks searching for consoles and other devices that I can use in the project.

Stages:

The initial stage would be the research stage where, as detailed above, I will be reading about hacking hardware as well as electronics in general. This stage will continue into the rest of the project as the topic will require constant studying.

The next stage will be searching in local thrift shops, second hand shops, charity shops and car boot sales as well as online sources such as Ebay and Gumtree in order to find old gaming equipment that is relatively inexpensive. This should ideally be completed in the first two or three weeks, with the deadline being the 28th October. Despite this, there may be other parts I discover later in the project that I wish to find, or I may try to replace something that has broken and so the deadline is not strictly fixed.

Before I open up circuits and handle the electronics i will need to experiment and practise building my own circuits and developing the precision and care it takes to hack hardware. This third stage will take place alongside the initial research stage, combining theoretical and practical study. By December 1st I intend for this stage to be mostly complete and that I will have begun the fourth stage.

Once I feel my technical knowledge is sufficient, the fourth stage is where I can start to build the instruments. This will probably take place during a very large majority of the project time. It will also include researching alternatives to hacking, including pre-existing Chiptune hardware and software. By February I hope to have built most of these instruments and should be already working on the fifth stage.

After the Instruments have been built and defined, I can begin the fifth stage which will involve arranging and composing the music. By March this should be nearing completion and the the sixth stage should definitely have begun before April.

The sixth stage will be organising and completing the final outcome. This may be a performance, a recording or perhaps a video.

The final stage is submitting the report, which is due on April 23rd. This report should be worked on throughout the course of the project with constant note-taking as I move through each of the stages.

All of these various stages will no doubt overlap with one another. I will most likely still be testing and experimenting right up until the final stages of the project.

Form of the Final Report

Depending on the nature of the instruments I have built, it might be appropriate to make a recording. It's possible that the instruments would need to be pre-programmed rather than having the capabilities to be performed using an external controller, meaning there would be almost no performance element worth watching. On the other hand, if there does end up being a large performance aspect, a live concert may be a better format. In this case I would need to also schedule rehearsal time and practice with other should I need assistance. This performance could also be recorded and/or filmed.

Resources

In order to fulfil the requirements of this project I will need a lot of basic electronic equipment, including a soldering iron and solder wire; audio cables and lengths of wire; piezo disks, crocodile clip leads, breadboards, resistors and capacitors. I will also need video game consoles and other hardware to take apart. I will need access to the library for reading materials as well as researching on the internet. If there were to be a concert I would also need access to a performance space where it would be appropriate and possible to set up the equipment. If I were to make a recording I would need to use the studio recording and mixing facilities in the university to do this.

Difficulties Likely to be Encountered.

Due to the nature of the project, there is a strong likelihood that lots can go wrong. Electrical equipment can be incorrectly hacked and broken and there is definitely the possibility that a lot of my ideas will simply not work. To anticipate and prevent the inevitability of hardware failure, I will be careful to record sounds as soon as anything works effectively. This way if there is a failure and equipment breaks I will not only have documented proof that it did work, but also have recorded material that I can use for my final composition.

Throughout the project I will be testing many alternative possibilities along the way. Given the volatile nature of hacking hardware, it's entirely possible that none of my hacking will produce any desirable results. As a result, throughout the project I will also be researching alternative methods of creating Chiptune. "Little Sound DJ" and "Nano loop" are both bits of hardware - essentially games - that can be bought which turn a Nintendo Game Boy into a composing tool. Also, the 1992 video game "Mario Paint" included a music generator as a mini game. Looking into more of these types of games and pre-existing hardware and combining them could be a great alternative to first-hand hardware hacking.

There also exists computer software and samples that can be downloaded for free. These can simulate accurately the sounds of old video game systems. Using these methods and combining them for my final project there is still scope for the final outcome, in this case most likely a performance, to be interesting and engaging even if the hardware hacking aspect fails.