In this module, you will develop an original interactive or reactive system in which music or sound is a key component. Innovative and imaginative methods of interaction by a participant should be explored, and this could be for any relevant context (performance, composition, installation, game, sound toy, etc).

During the first half of the module, you should consider and develop a written proposal and plan for this project. Your proposal should be around 2000 words and address the following areas:

1 Introduction

The aim of this paper is to propose the design and production of an hardware synthesizer, starting from an existing digital sound engine. In the sections that follow, it will be explained the background and the rationale behind the project, as well as the initial research undertaken. Then, it will be depicted a "blueprint" of the product: the general concept, the architecture of the system – both hardware and software – and the production plan will be covered in detail. In the last part the evaluation criteria will be set, in order to have a concrete measure of the work outcomes.

2 Background and Motivation

This project has been shaped and will be realised keeping as a pivotal point the *chiptune* subculture and its principles. As will be discussed in the next paragraphs, the product is conceived to be used by people already familiar with the environment and limitations of this musical style. Its purpose is to give users a different and more modern way to interact with a well-known set of sounds and synthesis capabilities.

2.1 Pushing the Limits Using Contraints

Chiptune As stated by Collins et al. (2014) The term *chiptune* refers to a style of electronic music where sounds are generated using Programmable Sound Generator (PSG) sound chips in vintage digital hardware, such as computers, video game consoles, arcade machines . . .

(also known as chiptunes, chip music or 8-bit music) is electronic music that uses the microchip-based audio hardware of early home computers and gaming consoles and repurposes it for artistic expression. Chiptune artists reinvent the technology found in old computers such as Commodore 64, Amiga and ZX Spectrum as well as in outdated video game consoles such as Nintendo Game Boy or Mega Drive/Genesis in order to create new music. The evolution of sound throughout the history of video games has been based on the technological capabilities of the computers or game consoles in which the game are played (McDonald, 2004). As with the visual side, the history of video game music is highlighted by the type of technology available at that time. As a result, we have the 8-bit, 16-bit, 64-bit, and the 128-bit eras. The first video games lacked

a sound component, included only a brief theme, a few sound effects or were limited to simple melodies by early sound synthesizer technology.

Game Boy DMG-001 and LSDJ

2.2   Rationale

3   Name of the Project

3.1   Concept

3.2   System Architecture

Hardware

Controls

User Interface

DMG-001 Mods

Sound

Midi Functionality

Screen

Power

Embedded Software

3.3   Production

Resources

Schedule

4 Discussion

4.1 Minimum Viable Product

4.2 Evaluation Criteria

5 Conclusions

References

Collins, K. and Kapralos, B. and Tessler, H. (2014) *The Oxford Handbook of Interactive Audio*. USA: Oxford University Press.

Section 1   Overall project aims and rationale Who is your project aimed at?
In what situation/context is it designed to be used?

- Live performance

- Music production

How and why will people engage with it?

- It will be an easy and straightforward way of making chiptune music

Section 2   Details of project What are the key hardware/software elements in your project?

- Sound engine: GameBoy DMG-01 (1989)

- New Hardware Interface

What sounds will your system work with? The system will generate sound using the sound chip of the GameBoy
What will the relationship be between user inputs and the sound parameters (mapping)? To interact with the sound, the Midi protocol will be used. Since the GameBoy can't read and understand Midi messages, a translation unit is required amid the interface and the sound engine (i.e. an Arduino board).
How does this mapping support your overall project aims?

Section 3   Evidence of contextual awareness, research and reading What other similar systems have you looked at? How has your idea developed from this research?
What relevant concepts have fed into your design process?

Section 4 Plan for implementation What resources do you require to complete your project? What specific tasks do you need to complete and by when?

This should be written using appropriate academic language with reference to relevant texts/media using Harvard format.