**Project report for the course Multisensory Interactive Systems Academic Year: 20XX-20XX**

**Project title**

**Authors’ name and last name,**

**unitn e-mail, and matricula**

**Reference possibili**

1. **Lord of the chords**: These guys created a card game for musicians. They proved that turning classical approaches to familiarize with technical concepts into a game experience is interesting for musicians.  
   <https://medium.com/@jonathanng/i-hated-music-theory-how-i-ended-up-creating-a-music-theory-card-game-musicians-love-ee857ea3c16d>  
   -  
   <https://www.lordofthechords.com/>
2. **Dato duo:** “It’s instrument for making electronic music together”  
   Two sides play together: One is a sequencer and the other a synthesizer.
3. **Position of Slowly adapting mechanoreceptors in hands**<https://www.researchgate.net/figure/3-Mechanoreceptors-in-glabrous-skin-vary-in-the-size-and-structure-of-their-receptive_fig2_265246764>  
   <https://www.researchgate.net/publication/265246764_Coding_of_Sensory_Information>
4. **Teenage Engineering**   
   <https://teenage.engineering/products/synthesizers>

**Abstract**

Briefly summarize your project report.

What is the problem you are trying to solve?

What is your solution?

Why is your solution a good one, and why would users want to use it?

What are the key aspects of your solution that will distinguish it from other work that is out there?

What are the main evaluation findings?

1. **Introduction**

What is your project about?

What are you trying to achieve with your project?

What is the context of your project?

What are the motivations for your project?

What are your hypotheses?

Why this area is interesting (e.g., potential applications, open scientific questions)?

What (if any) of the theoretical perspectives on multisensory perception / interactive systems (introduced in class) does your approach build on, question, test?

This project describes the ideas, development and first evaluation of an interactive musical device.

The aim of this project is to understand whether the playful interaction between two people and a particularly devised musical device can help introducing non musician players to basic musical concepts like tempo or sound effects.

When speaking of getting into music playing, having to own an instrument hasn’t been a blocking factor since mass production allowed to have a simple guitar or flute in almost every house, but the learning curve on many of these instruments can be as rewarding as steep. This often leads to difficulties when first starting to play an instrument and the player, especially young ones, can lose interest in the activity.

Our project proposes a game-like music experience that is designed to be played by two people. The designed device allows to generate music through its audio interface and matching visual effects on a screen through its video interface.

The audio interface features a simple step sequencer along with several controls that allow to modify as many parameters that shape the sound produced. The video interface is composed of a game controller and a program that mixes information coming from said controller and the audio interface, generating visual effects that can be shown on a screen or a projector.

The video controller features an analog joystick, an accelerometer and a vibrating motor to provide haptic stimuli to the user.

Our hypothesis is that non-musician users, through the video interface, will benefit from having to listen actively to music, interact through the controls and receiving haptic stimuli and that the experience recorded can help having a playful and serene interaction with the more complex audio interface.

The area that explores playful music interaction is interesting because it includes a class of possible devices, software programs or instruments that can be educational for non-players but also recreational.

The projects itself is based on the concept of embodied interfaces, interactive sonic experience design and haptic perception (specifically SA mechanoreceptors)

1. **Related work**

What have others done that is similar or related to your project?

What similar interactive systems are there?

What are related approaches? Are they inadequate? i.e., is your proposal an advance over state-of-the art?

Include citations for related work (you can build upon the bibliography cited at the end of each lesson, and complement it). You can cite the scientific literature and/or URLs. The citations and URLs should appear in a list of references at the end of the report.

One of the works that inspired part of this project is the Dato Duo music synthesizer by Dato Musical Instruments which is a very accessible “synth-for-two” designed with simplicity in mind and meant to be played by two people. It features a synthesizer side that contains controls that shape the sound produced and a sequencer side which controls act on the rhythm and the melody produced. (TODO: reference)

The proposed device is inspired to the successful two-people approach but diverges on the sensory modalities used, trading off the simplicity of a sound-only experience with a device that provide audio, video and haptic interaction in order to convey more information.

A similar natural graphic approach, even if on a more reasonable scale for a music synthesizer, is used by Teenage Engineering in their OP-1 and Pocket Operator lineup. (TODO: reference)

On the software side there are many games and programs trying to teach music basics to young children but also a good example of how a game-like approach can be effective with music students that need to familiarize with more structured music theory concepts: this refers to “The lord of chords”, a successful card game based on chords that was highly praised by music students and teachers. (TODO: reference)

All this products and projects are partially similar to the proposed device, some in the modalities and some in the motivations, but it seems to us that that our approach has not been used yet and it is worth exploring.s

1. **Architecture design**

Present the detailed design of your system.

What key assumptions are you making about your system, its users, and/or the environment in which it will be used?

What justification do you have for those assumptions being reasonable?

What are the components of the architecture, how do they fit together and talk to one another? What tools are you using?

**3.1 Usage model**

Describe how a user is going to use your system. Think about this as like a user manual. Describe the system from a user’s perspective. For example, the user does not need to know the components of your system and how it works internally, but the user does need to know what sensors to use to do various things. As part of the model, you should describe your user interface design.

1. **Implementation**

Which parts of your system are implemented?

How were they implemented?

What tools did you use for doing the implementation?

Which libraries did you use?

What parts of your design were interesting from an implementation perspective?

What kind of optimizations did you do?

You can add references to the code snippets listed in the Appendix.

1. **Evaluation**

What are your hypotheses?

What kind of testing have you done to validate your system?

Describe the experimental procedure: what participants were supposed to do?

What are your independent, dependent, and control variables?

Was a within-subjects, between-subjects, or mixed experimental design?

What are your results and are they statistically significant?

With the experiment you should measure:

1. The users’ performance to a task (behavioural response): you need to test various conditions according to your hypothesis
2. The users’ impressions/sensations in interacting with the system (subjective response): e.g., via a questionnaire given at the end of the experiment and/or between various experimental conditions

Consider reporting the results of the pilot study (e.g., if they helped you tuning your system and/or your experimental procedure)

1. **Discussion and conclusions**

Discuss the results emerged from the evaluation sessions you performed. Discuss the:

* Limitations: Describe any limitations with your design and implementation of the system.
* Lessons learned: What did you learn? How would you do things differently if you did the project again?
* Future Works: How would you improve the project if you had more time? What would be the further developments?

What can be concluded from the evaluation sessions?

**Group members contributions**

Describe the contributions made by each team member to the project. Be specific.

**References**

Provide a list of references cited with complete bibliographic information including URLs where available.

**Code appendix**

Provide a listing of the code for the project. The best way to do this would be to include a few relevant sample snippets as an appendix to the report which you might reference as part of your discussion on the implementation. Then, provide a complete listing of the code as a compressed zip archive which is uploaded to course website as part of your report.

------

NOTE: Together with the report, you need to deliver also your code. You can send a link to an online repository or send a link to a google drive folder (you must provide me with access to such online material).