NTNU

Norwegian University of
Science and Technology

Physical Computing Workshop

Introduction

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Workshop Design Criteria

— Facilitate a hands-on workshop with available, low-tech technology (e.g. mobile phones, contact mics, arduinos, web audio).

— Explore individually and in group the fundamental concepts behind physical computing (e.g. tinkering, programming, making).

— Promote a sharing culture of code and discoveries (e.g. writing reflective blogposts, sharing the code on github).

— Contextualize the workshop to the broader context of interactive systems for music performance at both theoretical and practical levels (e.g. readings, concerts).

What is the Workshop About?

— An intense 4-day workshop where you will explore physical computing and interactive systems.

— For the first three days, there will be a theme with paced exercises.

— At the beginning of each session there will be a warm-up discussion based on a relevant related reading.

— At the end of each session there will be a network music performance to showcase the own-built prototype.

— Each team will write a blog post about the challenges and opportunities of their own-built prototype.

— On the last day, there will be a mini-hackathon where you will develop an interactive system for music performance mixing technologies and techniques learned throughout the workshop.

Schedule Diagram
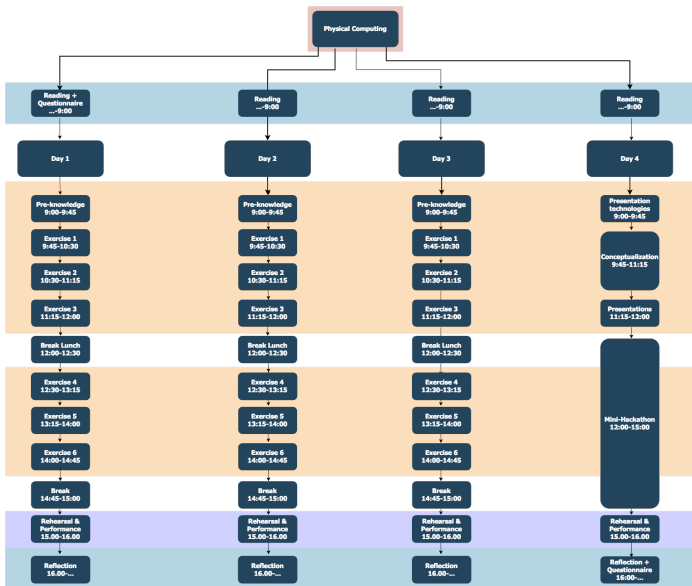
General Learning Outcomes

— Develop skills of computational thinking and programming.

— Explore how to create a prototype of an interactive system for music performance with low-tech technologies.

— Discover iterative design and the possibilities of network music by performing with own-built prototypes.

— Develop critical thinking skills applied to reflection on artistic practice and instrument buiding.

General Approach

— This workshop should be seen a starting point to get interest with physical computing applied to music tech.

— It has been designed to be low tech, that is, using open source or consumer affordable gadgets, except for the last day.

— Daily attendance is expected, as well as the completion of assignments before and after class.

What it is not

— An in-depth tutorial of a particular technology.
— A technical course: just enough to build things!
— A course about soldering.

However... related resources will be provided.

Grading

— 40% Individual work
You need to participate in the discussion/quizzes about the readings and document your personal contributions in the code to get a positive grade.

— 40% Group work
You will be expected to participate in the daily performance and blogpost to have a positive grade.

— 20% Participatory assistance
An overall participatory attitude and regular assistance can improve the grade.

Previous Knowledge / Preparation

— Every day you should check if there is a list of items that need to be brought to class.

— Every day you should check the suggested reading that will be discussed at the beginning of the class.

— It is not required, but if interested, you can start looking at the following hardware and web technologies: Handwaving.js, Arduino, P5.js, Tone.js, Flocking.js, LittleBits.

— For the mini-hackathon, you are allowed to bring / explore other technologies of your interest e.g. Myo bracelets, Bela platform, and so on.

Recommended General Readings
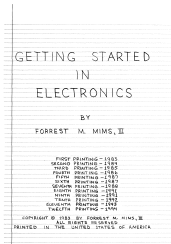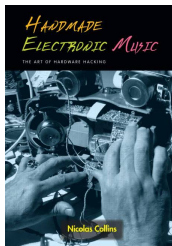
— The book *Handmade Electronic Music* by Nicolas Collins [1].
— ... and in general all the videos related to Collins' book:
  https://www.nicolascollins.com/video/
— The book *Making Things Talk* by Tom Igoe [2].
— The book *Getting Started in Electronics* by Forrest Mims [3].

References

[1] Nicolas Collins. *Handmade Electronic Music: The Art of Hardware Hacking*. New York: Routledge, 2004.

[2] Tom Igoe. *Making Things Talk: Practical Methods for Connecting Physical Objects*. " O'Reilly Media, Inc.", 2007.

[3] Forrest M Mims. *Getting Started in Electronics*. Master Publishing, Incorporated, 1983.