AIR Lab Workshop #2

Sensors and Sound with Firmata and Processing

AIR LAB
Affective Interactions & Relations
IT UNIVERSITY OF CPH

Today's Programme

14.30 - 15.00	Introduction
	Welcome to AIR Lab
	Purpose of today's workshop
	Intro to Processing, Sound and Firmata
	Examples
15.00 - 16.30	Workshop
16.30 - 17.00	Presentations and Play

What is Processing?

Open-source programming language with built-in IDE (integrated development environment)

- Often used to teach programming in a visual context

Can also be used in relation to graphic design, visual arts, interactive exhibitions, sound design, game design and electronic art installations

- Goes well hand in hand with the Arduino environment

Uses simplified Java syntax to create drawings, animations, and interactive programs.

- Programs created in Processing are called "sketches"

What is Firmata?

“Firmata is a protocol for communicating with microcontrollers from software on a computer (or smartphone/tablet, etc)”

https://github.com/firmata/protocol

Fast way to get started with Arduino, both by itself, and interfaced with Processing

We only need one program open (Processing), as long as Firmata is uploaded to the Arduino. For this workshop, all Arduinos have *“StandardFirmata.ino”* uploaded to them, and therefore we can only use “pure” analog and digital sensors.

This goes a long way for starters, but may not be enough for the more complex types of projects. Other Firmata sketches exists also - today we use the standard one.

Getting started with Processing

Introduction to the Processing IDE

Has everyone installed it? If not, do it right away via this link

Install the *Firmata* library released by David A. Mellis

Sketch → Import Library → Add libraries → Search for “Firmata”

Install the *Sound* library released by the Processing Foundation

Sketch → Import Library → Add libraries → Search for “Sound”

Note that Processing has several sound libraries, each with their own pros and cons

Notes on working with the Sound Library

Sound Library Pros:

- One of the simplest sound libraries for processing
- Good documentation, easy to understand, in general fewer lines of code to get going
- Easy to add effects and manipulate sounds, rather than just playback

Things to be aware of:

- Bugs (e.g. volume), lag/glitches when using Bluetooth speakers and headsets
- In some cases not as powerful as some other libraries, eg. it can’t record sound output

- Load time and synchronized playback (also applies for other sound libraries)
- Be aware of playing sounds in loop (also applies for other sound libraries)

Workshop Format

We will be working in small groups

How many of you are familiar with Processing or coding in general?

People with less experience can work with people with more experience

Getting started with your work

1. Open Processing and install the *Firmata* and *Sound* Library
2. Download the workshop folder on GitHub via this link and unzip it.
3. Open *WS2 CheatSheet.pdf* and use it to support your work
4. Use the GitHub examples as templates for your own sketches

Are there any questions before we begin?

Happy coding! See you at 16.30

When you are done:

Compress/zip the whole sketch folder and send it to vbpe@itu.dk