Communication: OF, Firmata, and OSC

Intro to Firmata

https://github.com/firmata/protocol

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

Communicating with Arduino using OF and Firmata

Pin interactions with the Arduino object in OF

Writing:

```
ard.sendDigital(pin, ARD_HIGH);
  //(or ARD_LOW)

ard.sendPWM(pin, PWMvalue);

ard.sendServo(pin, angleValue);
```

Reading:

```
ard.getDigital(pin);

ard.getAnalog(pin);
```

Using OSC to expand toolkits and create pipelines

OSC

Open Sound Control — “a protocol for communication among computers, sound synthesizers, and other multimedia devices”

http://opensoundcontrol.org/

OSC Packets

- OSC information is transmitted in OSC packets.
- Any application that sends OSC Packets is an OSC Client; any application that receives OSC Packets is an OSC Server.
- Can be implemented in TCP or UDP, most implementations are UDP

OSC packet components

An OSC packet consists of:

- OSC Address Pattern
- OSC Type Tag String
- Zero or more OSC Arguments.

The type tag acts as a packet checking mechanism, similar to a checksum or file verification

OSC type tags

OSC Type Tag	Type of corresponding argument
i	int32
f	float32
s	OSC-string
b	OSC-blob

OSC with openFrameworks

We'll use openFrameworks as the client (sending packets), with OSC communication to Processing acting as the server (listening for packets).

Other tools that can communicate over OSC

MaxMSP

Ableton

Python

Ruby

Apps: touchOSC, OSCulator

DMX lighting

…and many more