

# Group5\_CMLS\_HW3

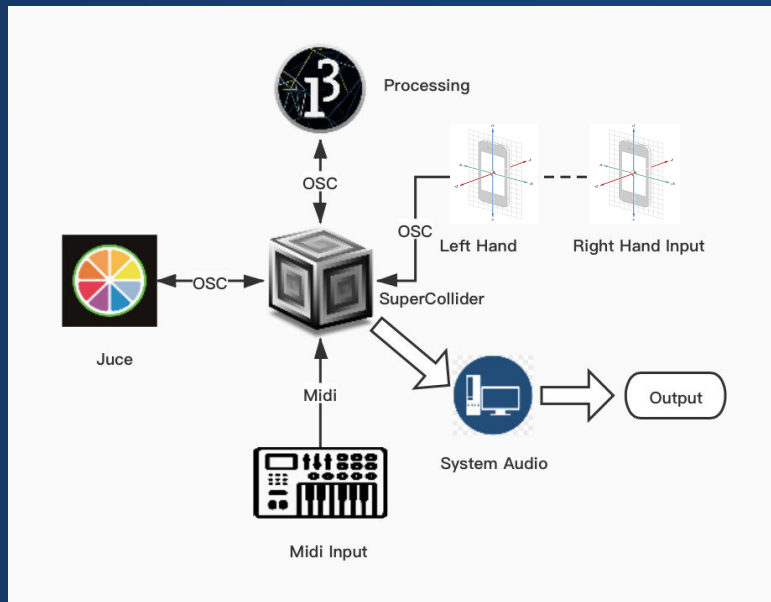
DrumKit-Supercollider

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# DrumKit: System Design

Figure 1: DrumKit System Design



- 8 different drum sounds
- Multiple user interfaces to control
- Possibility to use MIDI and iPhones as input devices
- Communication using OSC protocols

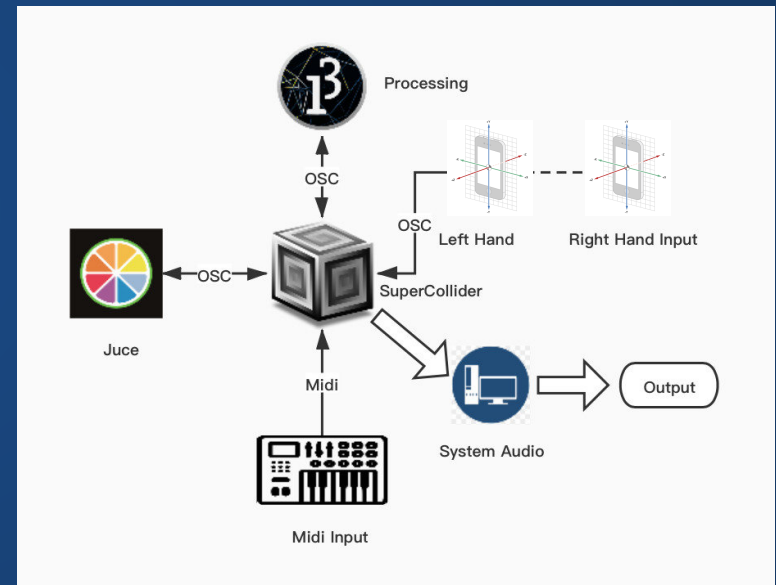
Figure 2: GUI on SuperCollider, JUCE and Processing



# Protocols

- Both MIDI and OSC protocols are used inside our DrumKit
- OSC protocols are exploited to exchange messages between Processing interface, phone controllers, JUCE interface and SuperCollider
- MIDI communication are used to map the MIDI input device

Figure 1: DrumKit System Design



# Sound Synthesis

- A basic set of drum sounds enriched with non-traditional ones: bass drum, hi-hat, snare drum, cowbell, kick, frequency modulator, clap electro, tom
- To better accommodate for the user's preferences some parameters of the synths can be modified in real-time
- 8 different Synth nodes defined using SynthDef Class in SuperCollider



Figure 3: SuperCollider User Interface

No.	Name	Sound
1	bd	Bass Drum
2	hh	Hi-hat
3	sn	Snare
4	cb	Cowbell
5	kc	Kick
6	fm	FM
7	ce	Clap
8	tom	Tom

Table 1: List of SuperCollider SynthDef

# GUI on JUCE

- Allows the user to control the drum kit and its synths' parameters via a set of knobs
- Includes a simple but fully functional 16-step sequencer that can be used to control SuperCollider Patterns remotely and play them
- A Tempo slider changes the bpm
- The instrument selector slider selects a specific sound to be sequenced using the pads on the bottom right part of the window
- A volume slider for each sound and other parameters

Figure 4: JUCE User Interface



# Interactive Control

## Processing

- MousePress on Processing interface
- Simple animation feedback
- Using oscP5 library to send/receive OSC message with SuperCollider



Figure 5: Processing User Interface

## Motion Controller on iPhone

- Monitor acceleration on iPhones
- Send OSC message by "Syntien" APP to SuperCollider, trigger sounds generation
- Use two phones, then you get a pair of drumsticks

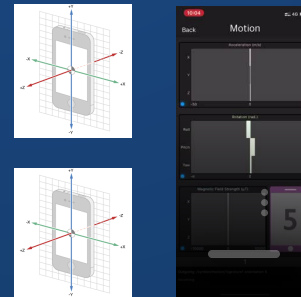


Figure 6: Motion Controller on phones

No.	Name	Map to
1.1	$x < -5, y > 5, z > 5$	Kick
1.2	$x < -5, y < -5, z > 5$	FM
1.3	$x < -5, y > 5, z < -5$	Clap
1.4	$x < -5, y < -5, z < -5$	Tom
2.1	$x > 5, y > 5, z > 5$	Bass Drum
2.2	$x > 5, y < -5, z > 5$	Hi-hat
2.3	$x > 5, y > 5, z < -5$	Snare
2.4	$x > 5, y < -5, z < -5$	Cowbell

Table 2: Example Mappings on Two Device Input(both hands)



# Let's Play!



# Ref & Links

- GitHub repository: <https://github.com/Lorenzoncina/DrumKit-Supercollider.git>
- Detailed report: <https://github.com/Lorenzoncina/DrumKit-Supercollider/blob/master/docs/main.pdf>
- Demo Video: <https://www.youtube.com/watch?v=CN5pVXBAqJA>

Regards, thanks for your attention!