YASC

GitHub

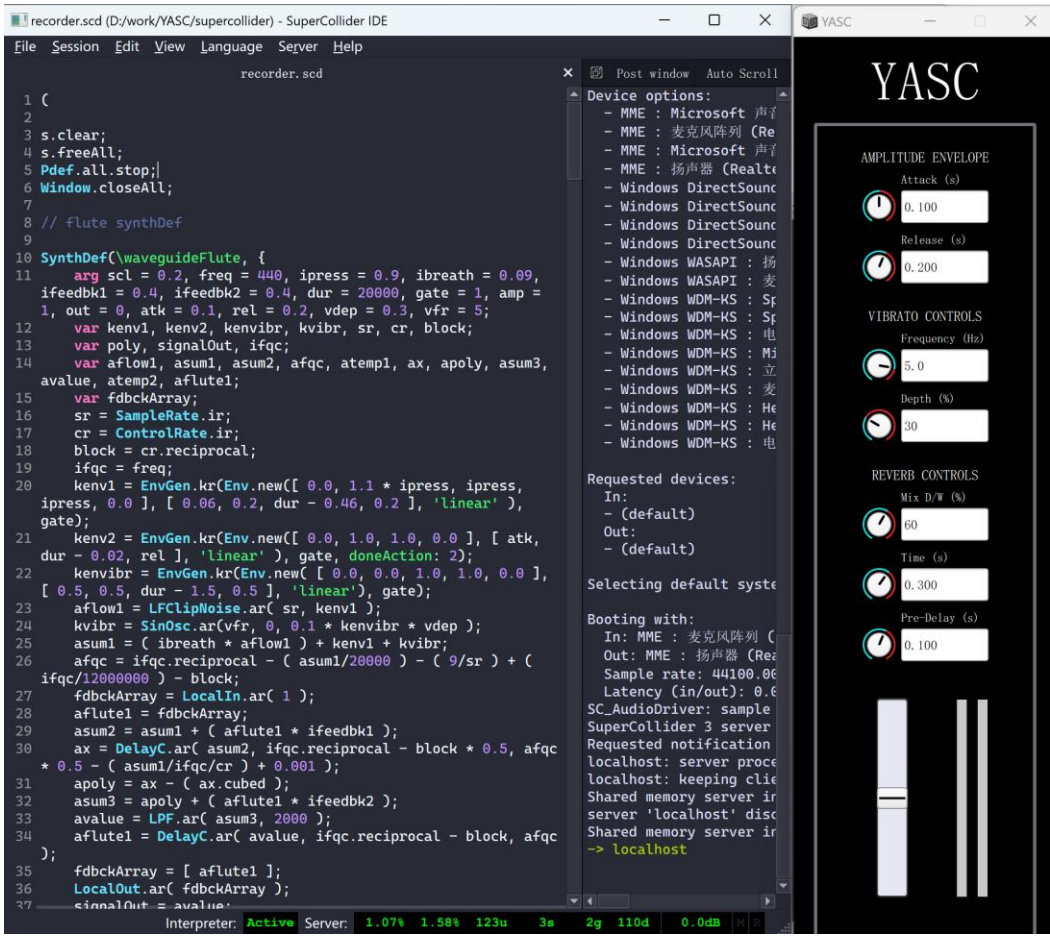
By Yan Zhuang

Introduction

- The goal of the project is to develop an interactive recorder performance tool, incorporating Joy-Con controllers via a web interface for gesture-based inputs and SuperCollider for sound synthesis.

SuperCollider

- It's an engine for sound synthesis and algorithmic music composition.
- It's a real-time sound-based OOP language.
- https://supercollider.github.io

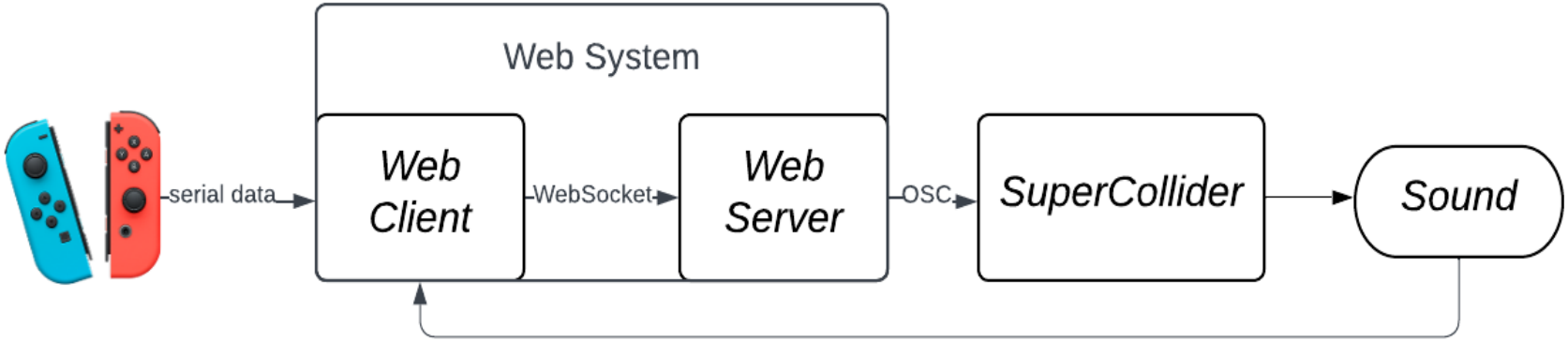


Joy-Con controller

- Primary controllers for the Nintendo Switch gaming console.
- We could use that to play music.

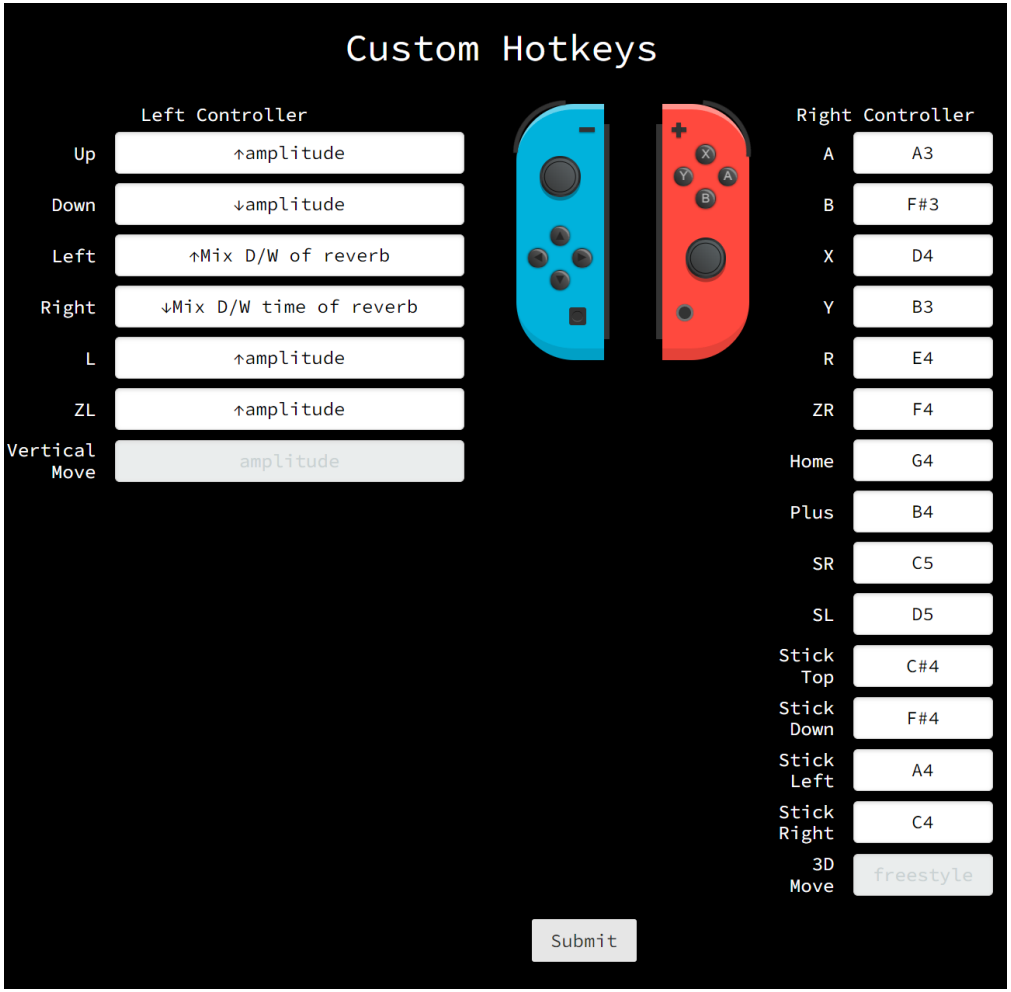
Structure overview

- User interaction accomplished with Joy-Con controllers.
- Web system acts as main interface.
- SuperCollider serves as sound synthesis engine, generating/editing sounds according to the web system commands sent via OSC protocol.
- Sound captured by the web system to provide visual feedback.



Web system – Map your controller

- Through this page, Joy-Con controller can be mapped to different functions.
- The left controller is responsible for adjusting parameters in SuperCollider.
- The right controller is dedicated to play notes.



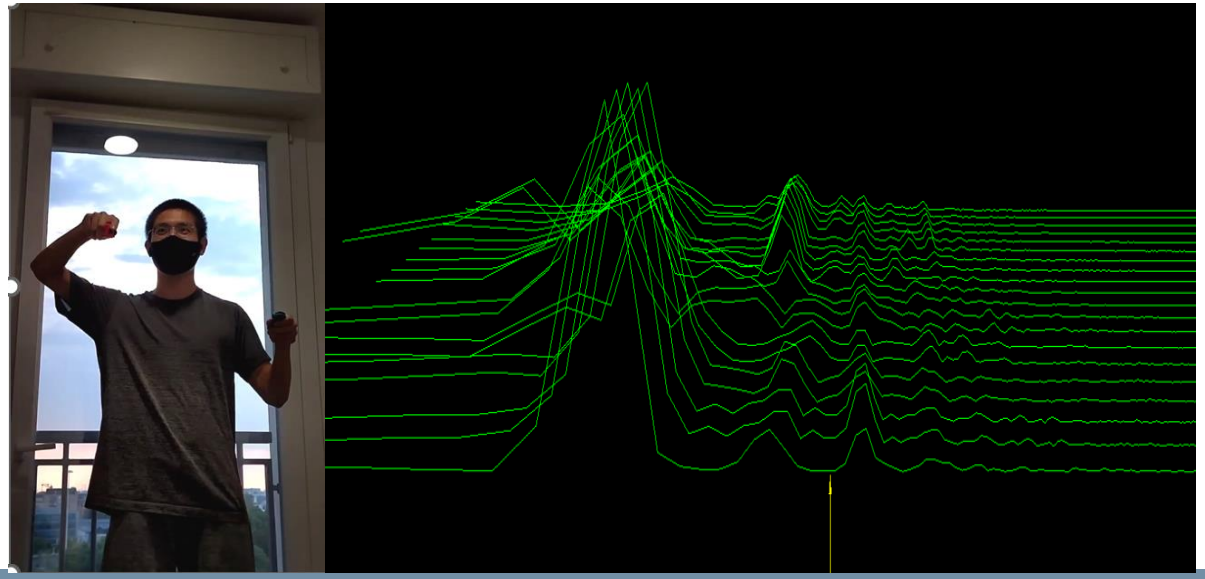
Web system – Train your memory

- The dino game page is an interactive training tool designed to help users familiarize with their custom hotkeys.

- If you want to jump, press the corresponding hotkey.

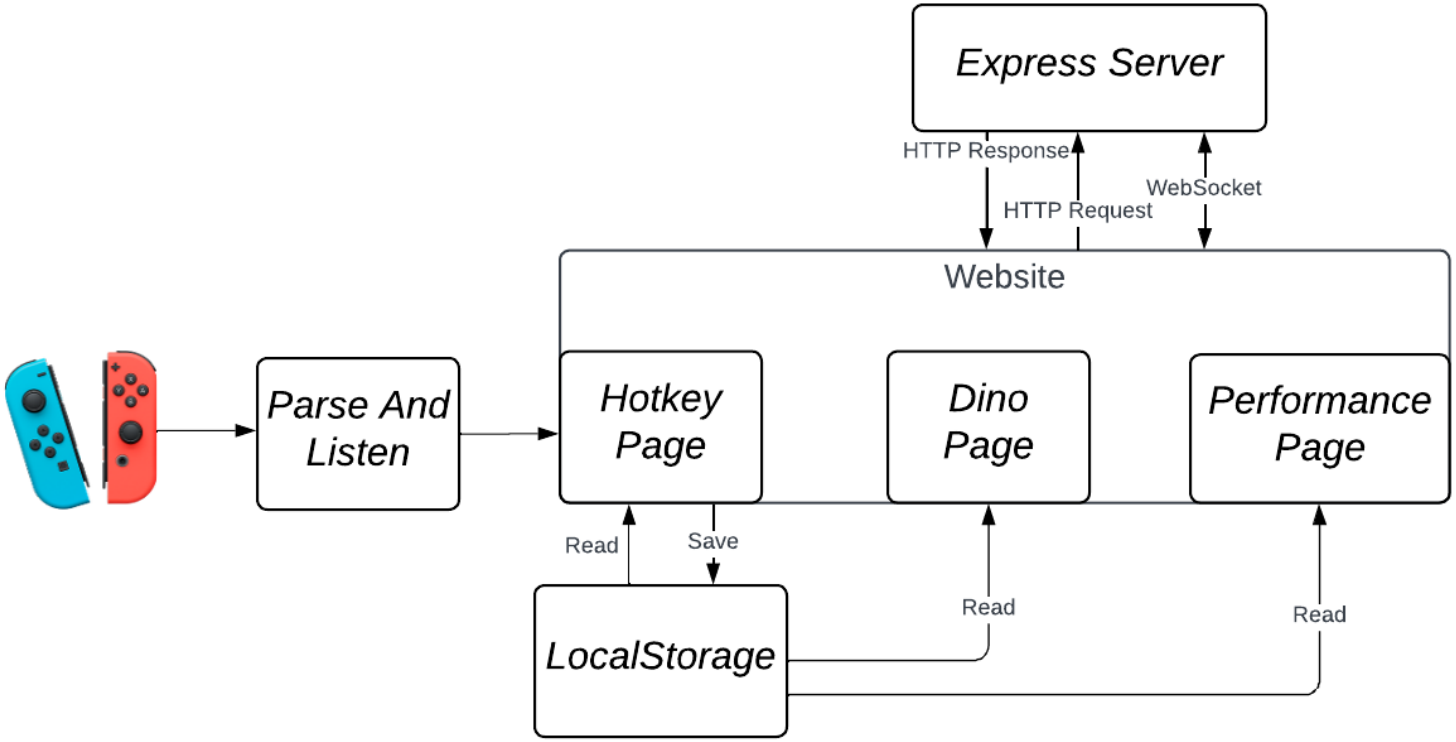
Web system – Play recorder

- The performance page provides an immersive audio-visual experience by showing the output sound spectrum.



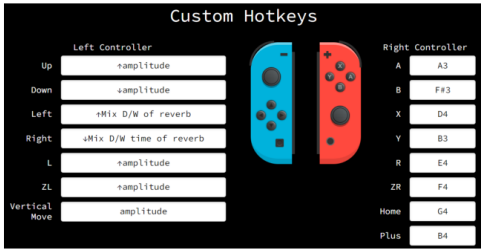
Web system – Implementation

There are three main components which run the web system:



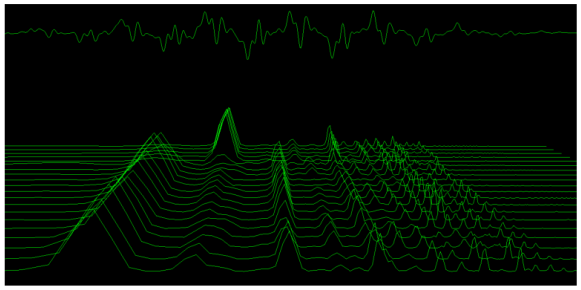
Web system – libraries

1. Vue3 for web interface.
2. joy-con-webhid for parsing joy-con controllers' input.
3. meyda for the sound analysis, three.js for rendering spectrum.



(a) Hotkey page detail

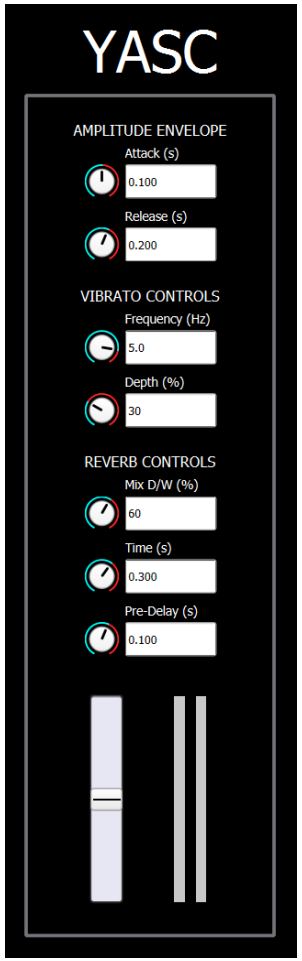
(b) Dino game detail



(c) Performance page detail

Sound synthesis – GUI

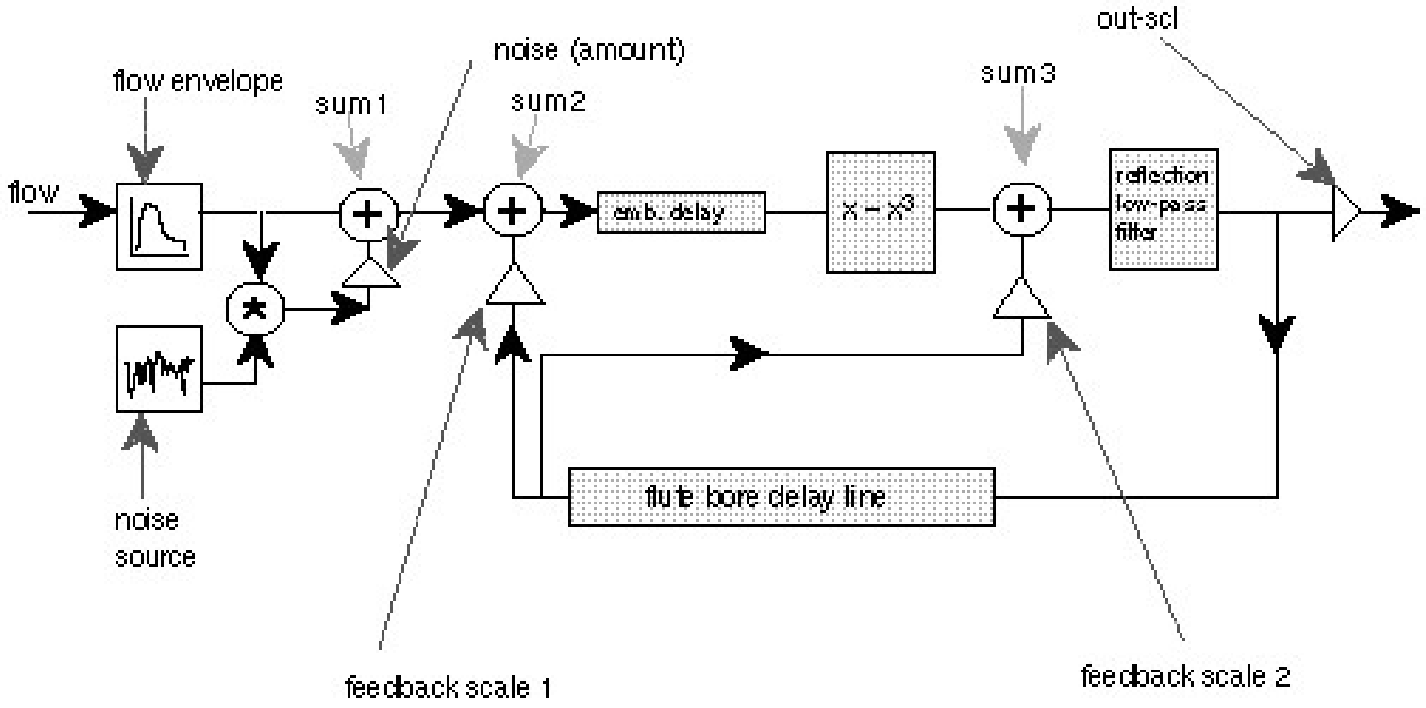
The recorder sound produced in SuperCollider. Users can see the changes made with controllers of some parameters:



- Amplitude envelope attack and release time.
- Vibrato frequency and depth.
- Reverb D/W mix, time and pre-delay.

Sound synthesis – Implementation

Perry Cook's recorder model



Future work

- Implement features that allow users to record, save, and replay their performances.

- The waveguide model doesn't behave well at high frequencies. In the short future, multi-modal or multi-dimensional models could be adopted to solve the issue.

- Offer more sophisticated sound parameters for users to control in SuperCollider.

Thanks