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For my project I have created a tool for musicians that can record and playback their performances with live graphics. The code switches between different states, triggered by the mouse being pressed anywhere on the screen. Each state is linked by a graphic of a rotating spiral. The first click triggers the recording state. This part of the program records from the user’s microphone until the next click. While they record I use the rotating spiral graphic to display the amplitude of the recording. The original colour of the spiral in this state is green, but goes from yellow to red depending on how loud the amplitude signal is. The user can then click to stop the recording, resetting the spiral graphic back to its neutral state, then click again to save the recording and start the playback. The recording saves to their laptop. The graphics for the playback take the recording’s FFT signal to create movement and colour in the spiral graphic. The original colour here is blue but can range in hues to many other colours as well. The greater the FFT signal received is, the wider range of colour and movement there is in the spiral.

The intended user for this project is musicians, though anyone creating sound can use it. The project is designed to be clear and easy for anyone to use, even without a background in p5js. It can be used as a fun way to present a musician’s performance recordings. Especially in Covid times, it has become important for musicians to perform their music digitally, rather than in a live setting where audience numbers are limited at best. The graphics add an extra aspect to a musician’s performance that is fun and a visually pleasing way to conceptualise the music. I tested the code for both solo musicians and group ensembles. It works well for both, but you can get a lot more out of the graphics by recording a group. The different dynamics and timbres create a more complex FFT signal and lend themselves to a wider range of colours and shapes in the recording playback graphics. The piano works well as well, because of its range of pitches, dynamics and its ability to have different articulation and pedals. I used the piano to create my presentation of the code for this reason.

My code is structured as a setup function, draw function, mousePressed function and class for my graphics. I established my oscillator, mic, recorder function, new FFT and new amplitude in the set up function. The mousePressed function controls what happens to my recording, oscillator, and sound file every time the mouse click triggers a new state on the interface. My draw function takes which state the user is currently in from the mousePressed function and gives text instructions to the user and calls the graphics from my class. Since the graphics are similar, I have them all in one class with three different functions. One is for measuring and displaying amplitude, one for creating graphics from my FFT signal, and one in a neutral state, with no colour or change in movement.

The most significant inspiration for me was Jiwon Shin’s Audio Visualisation workshop in p5.js[[1]](#footnote-0). I really liked their FFT visualisation and incorporated that code into my own program. I was also inspired by Dan Tepfer’s Tiny Desk Concert.[[2]](#footnote-1) Tepfer created an algorithm that fed back into his piano, having it duet him as he improvised. This live performance also created graphics on the screen above him, and I took a lot of inspiration from the aesthetic of these graphics. A similar inspiration was the NZSO’s Rite of Spring, which was accompanied by live graphics created by Nocturnal[[3]](#footnote-2). These graphics explored different shapes, textures, objects and movements which reacted to the music being played. As a classical performer myself, I have an interest in how code and graphics can be used to enhance a musician’s performance. I wanted to have a synesthetic approach to my own code, with music creating different colours and shapes as a way of visualising the sound.

I consider this project a success because I was able to realise my initial proposal. I created the graphics I envisioned both for the recording state and for the playback. When I showed my code to my friend, who plays piano professionally, he was able to pick up how it worked easily and had an enjoyable time playing around with different improvisations to see what patterns he could create in the playback. The code functions as intended with no bugs or crashes, and is easy for anyone without a background in p5js to understand, just as I had intended. The only reason I would consider this project not to be a success is that it can be very laggy, and sometimes my laptop microphone makes crackling noises in the playback. If I were to do the code again I would try structuring it a little differently to prevent lag. To take this code further I’d be interested in creating more options for the user to control what state they’re in. I would like to give them the option to record, re-record without playback, playback their recording, or even just play along to live FFT graphics that I used in the playback state, without having to record first. I would use a drop down menu to control states rather than clicking to give the user this freedom.

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2. NPR Music. *Dan Tepfer: NPR Music Tiny Desk Concert.* (2019). *YouTube*. <https://www.youtube.com/watch?v=SaadsrHBygc&t=890s&ab_channel=NPRMusic>. [↑](#footnote-ref-1)
3. *The rite of spring*. Experience live classical music. (n.d.). <https://www.nzso.co.nz/concerts-and-tickets/season-2021/podium-series-the-rite-of-spring/>. [↑](#footnote-ref-2)