

## Idea

- My project is a wavetable synthesizer that visually represents the mixing of different waveforms.
- The user is given a geometric shape. Each face of the shape represents a waveform.
- The position of the “cursor” adjusts the amplitude of each wave in the mix.
  - The distance between the cursor and face determines the gain.

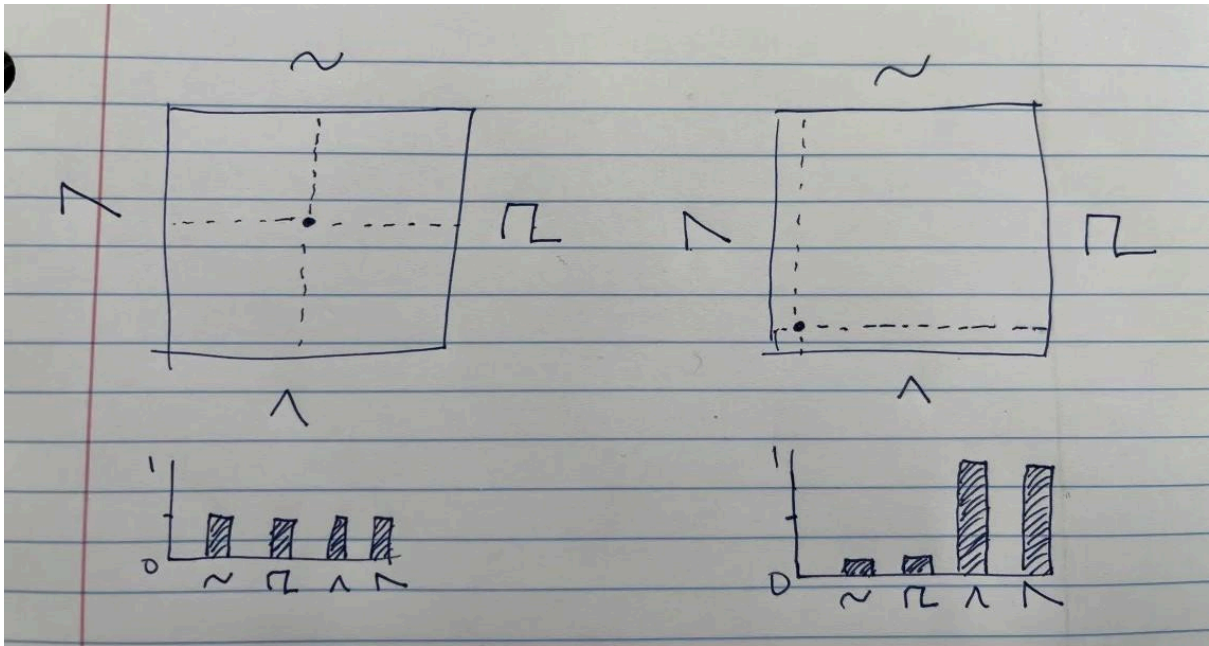


Fig 1. Two examples of 2D mixers

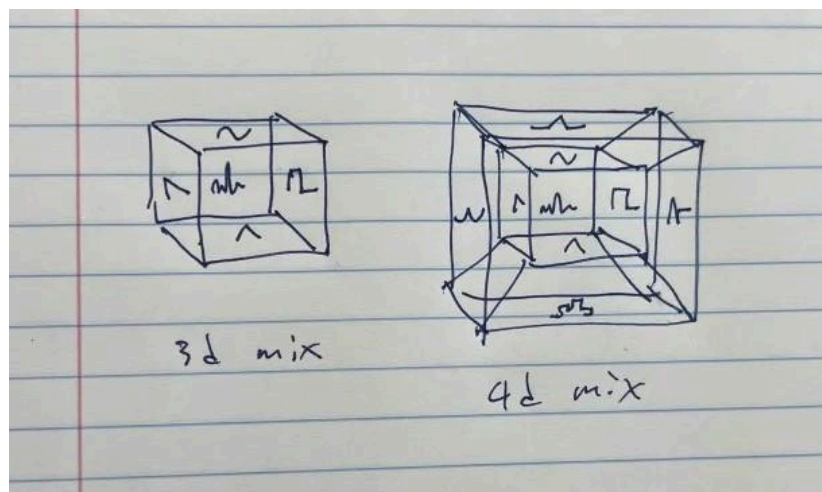


Fig 2. extending the concept to higher dimensions (cube and tesseract)

## Technical details

- I plan to write the code using the [libsoundio library](#).
- I will use the [C3 language](#), which has C ABI to allow use of the library.

## Method

- I will use an approach I found on [wikipedia](https://en.wikipedia.org/wiki/Linear_interpolation): iterating through arrays containing waveforms at a given speed, and using linear interpolation to fill in the gaps.
- I already have a [repo up](#) with a working example (440hz sine wave)

## Hardware

- If time permits, I want to have a hardware interface.
- I will use a Raspberry Pi and read from plate-mounted potentiometers and buttons.
- I also want midi input. If I have time I want to integrate a keyboard into the device itself, kind of like the Minimoog.
- I will also have a display to show the position of the cursor within the shape.
  - To simplify the design, I will use the builtin HDMI and audio jack.

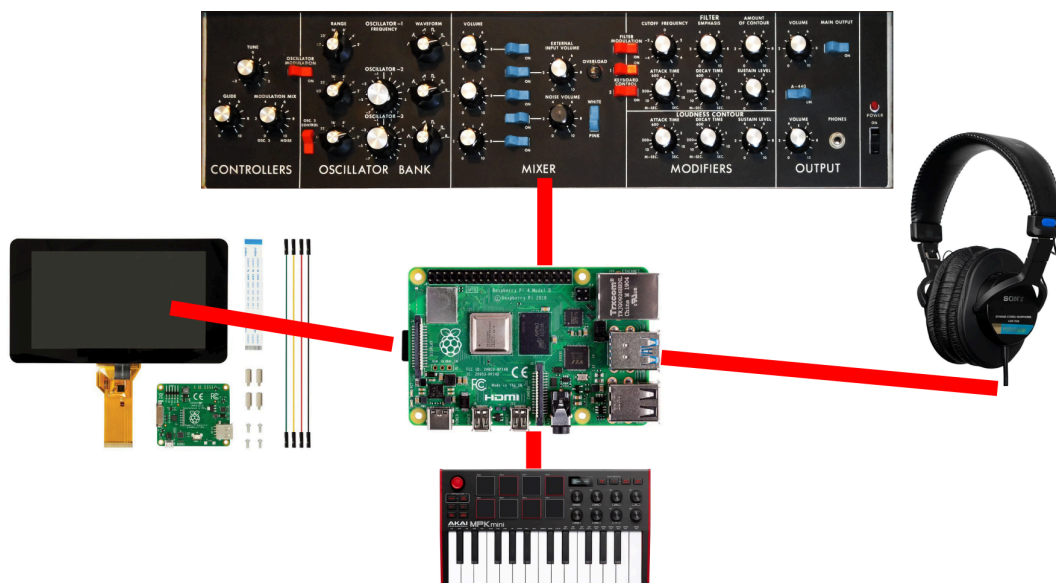


Fig 3. Architecture



Fig 4. Final enclosure design example (mine will be smaller)

## References

[The original idea came from Ewan Bristol's Plugdata sketch](#)

- I expanded on it by making it 3d and having hardware

[Fig 3. The front panel is from the Moog Minimoog](#)

[Fig 3. The headphones are the Sony MDR-7506](#)

[Fig 4. This is the Waldorf Music "MK2"](#)