

### **iSing Voice Harmonizer**

We seek to implement a voice harmonizer using discrete time Fourier transforms and pitch modulation of a voice signal. The user starts by singing into a microphone and playing several keys on a MIDI keyboard. The program then takes the microphone signal and performs an FFT to determine the pitch that the user is singing. Next, the program makes several copies of the user's voice, performs pitch modulation on each signal to match the keys being played on the keyboard, and outputs the signals blended together. The achieved effect will allow the user to sing several notes at once forming chords and chord progressions.

Our team plans to code our own FFT module from scratch and write our own pitch shifting function. We may also implement additional features as time permits, including a monitor displaying notes being played or sung, sampling and looping capabilities, and filters such as EQ, reverb or compression.