# architecture

The hardware component of *carbon lung* (1.0) consists of a 5v RGB light strip and a DIY capacitive touch interface connected to an Arduino Micro controller board. The Arduino is connected to a computer via USB, which serves both as power connector and data bridge. Over USB, the the Arduino communicates with a Max/MSP patch which aggregates user input, synthesizes sound, and sends control data to the Arduino Micro.
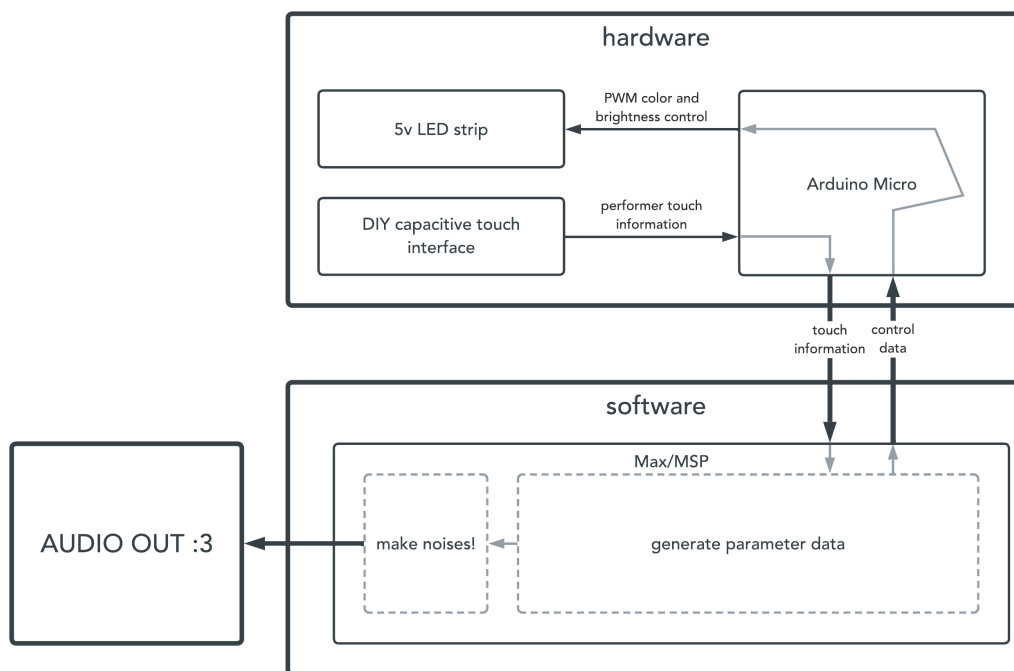
The Max/MSP patch consists, broadly speaking, of five systems:
- a **parameter controller**, which takes user input and maps it to audiovisual parameters
- a **scheduler**, which triggers the introductions of individual sound elements
- a **sampler**, which chooses and plays sound files of assorted breaths
- an elementary **formant processor**, which generates inhale and exhale effects from white noise
- a **mixer**, which controls signal routing and applies a few master effects

light and sound

carbon lung produces a vibrant multimedia experience that captures the intimacy of the human breath. Ample control of density, depth, and timbre allows for artistic expression and ample variation in "mood" (for example, calming reassurance or violent desperation.) *carbon lung* makes use of recorded and synthesized sounds to form a sort of "meta-human" breath apparatus.

Generated light varies in color and amplitude to match the mood of the sound. The physical flexibility of the LED strip allows for a multitude of lighting scenarios, particularly ones which physically involve performers.

ideological implications

carbon lung explores intersections between the human and the machine. The sounds it produces are rarely comforting, but often compelling. I, personally, imagine a grimy difference engine shuddering. I hope that this picture of the broken machine, the dusty automaton, queries societal perceptions of novelty and progress. I hope it suggests that the instruments (and composers!) we are most fond of are the flawed ones.

I built *carbon lung* as part of an investigation into the nature of collaboration. Its "imperfections" make it somewhat unpredictable by design, rendering it tricky to perform with. Composing for *carbon lung* forces me to enter into an unsteady alliance with the machine. It forces me to integrate further non-determinism into my practice as a composer and performer.