

Parsons + New World Symphony

Breath and Brass

December 9, 2013 by qkbock



(<http://parsonsnws.files.wordpress.com/2013/12/2013-11-10-14-14-12.jpg>)

“Breath and Brass” visualizes the act of musical performance – both the physicality of the musician’s breathing and the technical nature of the generated music. It newly illuminates the interplay between the instruments and incorporates a more conscious awareness of the musician’s exertion into the audience’s experience.

Working with Poulenc's *Sonata for Horn, Trumpet and Trombone* we visualize inhales and exhales together with the notes, volume and speed of the music to reveal the connection between the physicality of music making and the relationships of the sounds and instruments to each other.



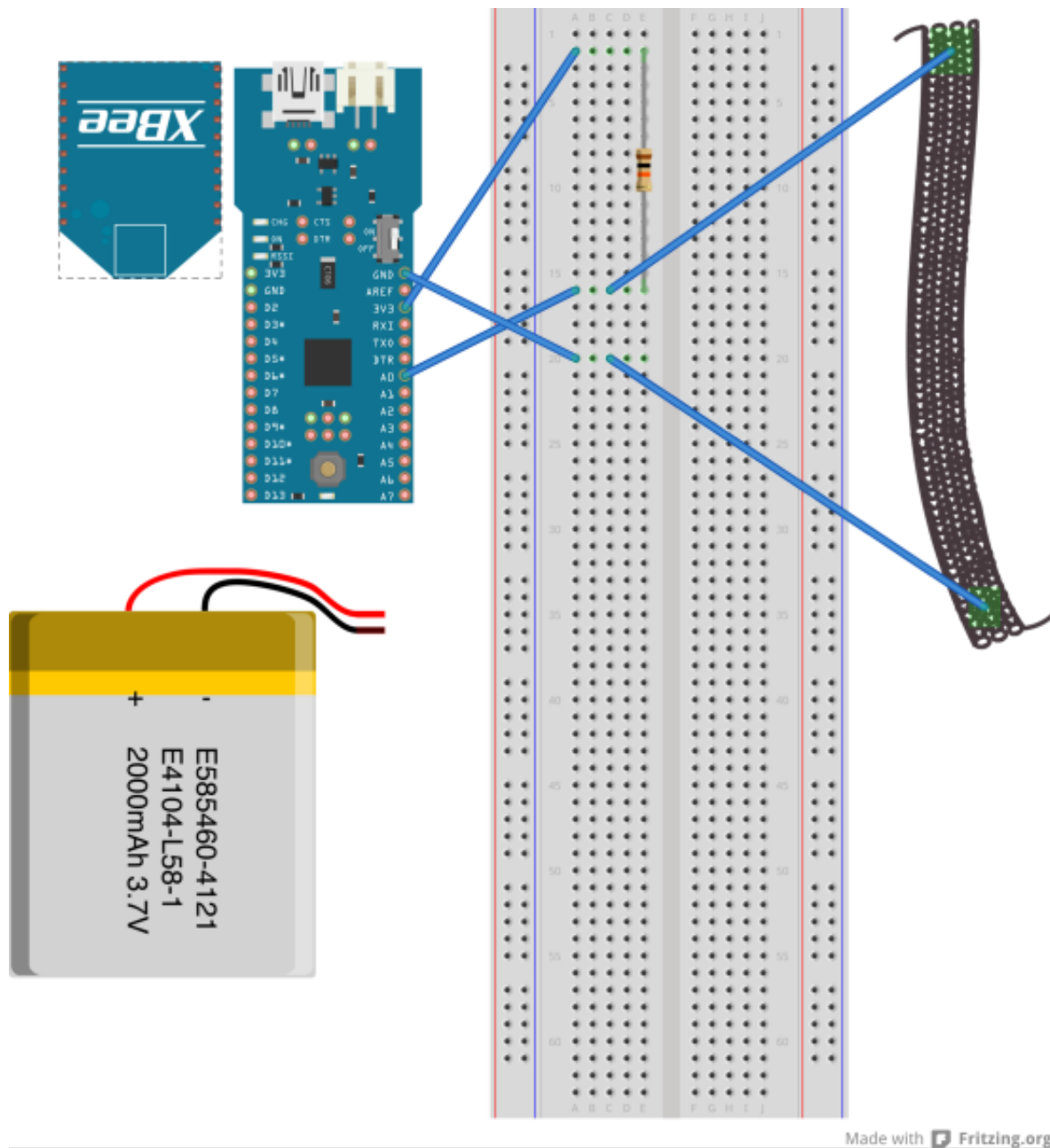
(<http://parsonsnws.files.wordpress.com/2013/12/2013-11-10-14-14-00.jpg>)

The project relies upon audio analysis and breathing measurement.

The audio analysis uses Fast Fourier Transform (FFT) thanks to an existing code library written in C++. The library breaks the audio signal into 17 channels of different frequencies from low to high and also provides additional data such as amplitude.

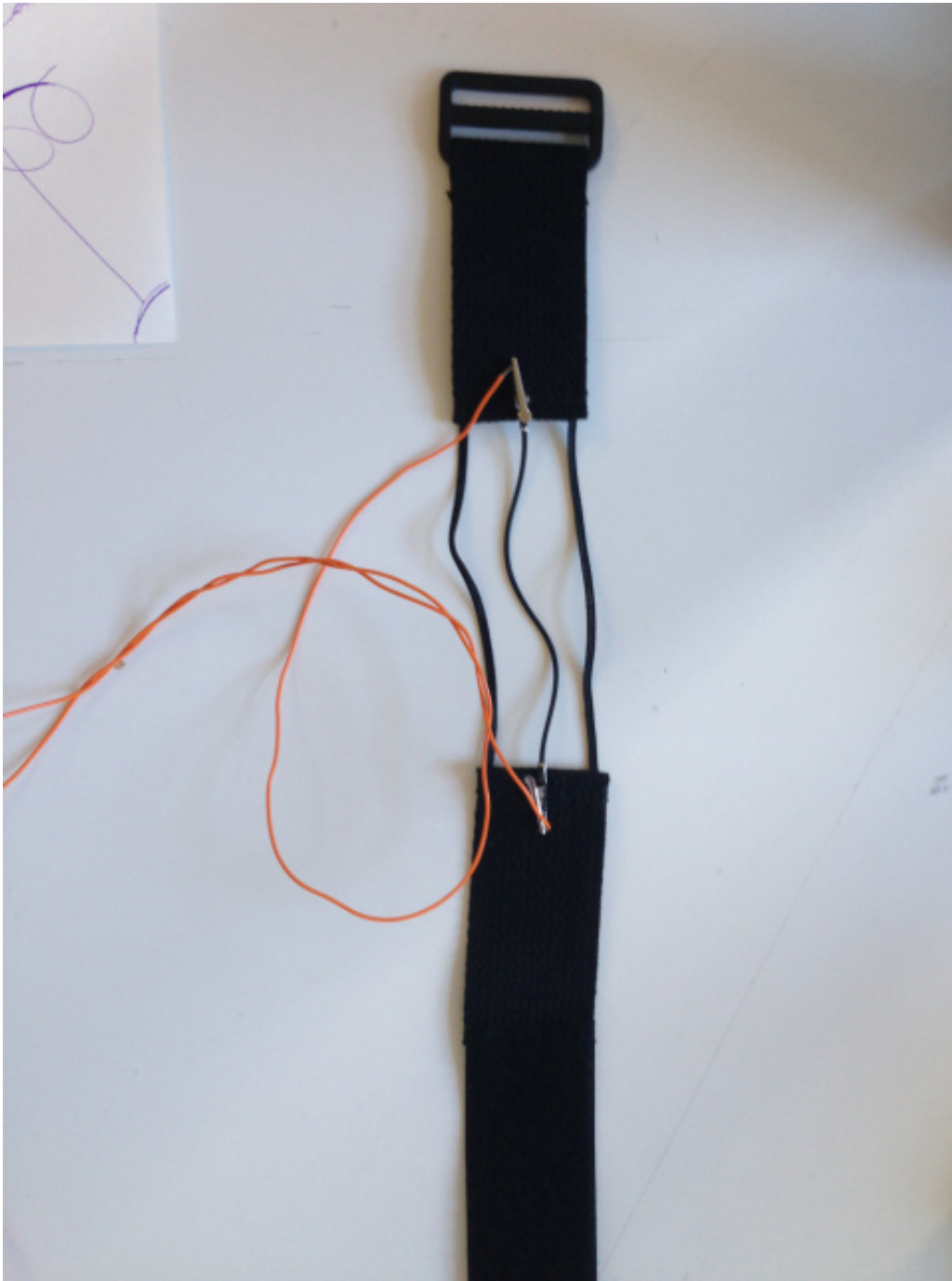


To measure the breathing we built custom hardware, consisting of a velcro and elastic band that wraps around the musician's torso. The front of the band is made of conductive rubber, which measures the expansion and contraction as he or she breathes. A WiFly unit attached to the band sends the data wirelessly to the computer running the software.



We integrated all the data into two narratives, dubbed “Orbits” and “Lines.” “Orbits” consists of a series of concentric circles of increasing radius. The difference between radii maps to the breathing data, so the circles expand and contract. There is one circle for each of the 17 bands of frequency data, and activity on each frequency populates the respective orbit with orbiting “planetoids.”

“Lines” consists of three creatures made up of lines, one creature for each musician. The breathing data controls the length of the lines themselves, causing the creatures to grow and shrink, while the amplitude of the audio maps to the opacity, causing the creatures to brighten and fade. Screen captures of the two movements can be found in the Google Drive folder.



Final Software Movement 1

(<https://github.com/LordOfCorners/SymphonyCollab/tree/master/integratedCodeFinal3>)

Final Software Movement 2

(<https://github.com/LordOfCorners/SymphonyCollab/tree/master/Mesh>)

Final Firmware

(<https://github.com/LordOfCorners/SymphonyCollab/tree/master/wirelessArduino>)

Full code repository (<https://github.com/LordOfCorners/SymphonyCollab>)

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