1. Live Audio
   1. This is one of my favorite works to just play around with. I used burgeoning web standards to get live audio data from the user’s mic. Then I take the Fourier transform of the data to display the frequency distribution. I clipped the frequency distribution to a much smaller range that shows more detail in the human vocal range. Using less traditional data representation such as audio and interactivity is some of my favorite work to do. I consistently find engaging multiple senses and particularly getting users to interact with the data produces strong impressions.
2. GW
   1. This movie is related to my senior thesis at RIT. Gravitational waves are created by compact objects, like black holes or neutron stars, rapidly orbiting each other. As the accelerate they create ripples in space-time. Part of my project was to simulate these situations. To better understand how these gravitational waves were effecting space-time I created this. This animation is how concentric circles of particles, represented by black dots, would be effected if two black holes were in a circular orbit directly above them.
3. US population
4. E and M
   1. Throughout my physics degree I was often asked to understand complex technical systems. My first reaction when asked to understand a complicated system was to create a visual to better understand its behavior. This particular visual is the electric potential for a set of complex but spherically symmetric initial conditions.
5. Listen to warming
   1. Global warming is a problem forefront in the minds of many of us. This particular data representation has had a visceral effect on a number of those I have shared it with. The harsh waveform along with the relentlessly increasing tone clearly communicates the sweeping global changes we have instigated on this planet. Pairing that with a custom designed earth which turns a darker and darker red as the sound progresses produces a unique overall experience of the fact that our planet is warmer than ever.
6. Detection Geometry
   1. This is the end result of my second project with LIGO. I worked closely with Dr. Whelan to first calculate and then visualize the detection geometry of the LIGO interferometers. Because of the interferometric nature of LIGO there are some directions along which each interferometer is more or less sensitive. By combing the geometries of the different telescopes where two or more overlap we get a coincident detection geometry. The particular figure shown here is the 50% detection threshold for coincident detection between any two of LIGO Livingston, LIGO Hanford and VIRGO. The dots each represent a galaxy so we can see approximately where in the universe we could detect collisions.