FAQ

How would you continue project development if given time?

While making a more robust power supply block would be the first priority, further development would aim to achieve longer animations and faster upload times. Another option would be a larger matrix with more pixels for resolution, allowing a wider set of data to be displayed more smoothly perhaps. A better Bluetooth module than the HC-05, more onboard RAM devoted to animation storage on the FPGA, and investigation into the sending capability of the Bluetooth Serial Web API would help achieve all of the above development goals.

What lessons did you learn from the project?

Start early, use resources across campus, and plan ahead for the time requirements needed. Various professors exist with wide skill sets that can provide instrumental advice to improve a team's capability to make sound design choices.

What would you do differently if you could do it over?

A different PCB service which provided better support for high current circuits as well as a new selection of voltage regulators that use a different technology would enable us to create a more robust and persistent final product. The overheating issues didn't cause any real problems but created functional problems in the device at a long duration of use on full brightness.

What was the biggest challenge and how did you approach it?

Bluetooth, and very systematically. The wireless animation upload system required a wealth of tests at different quantities and speeds to finely tune the ability to consistently read in accurate animation data.

What is the most impressive thing about your project?

Using an FPGA to achieve the needs of the onboard microcontroller both had stunning effects and a high degree of technical complexity. For a system tying together JavaScript, SystemVerilog and multiple communication protocols, it was shocking that the final product was so plug and play.