**YouTwo**

**IoT Capstone Idea Submission**

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GitHub: [IvanBoyd/IoT\_Capstone-IvanBoyd: Keystone Project Fall, 2021, CNM/FUSE/IoT Bootcamp (github.com)](https://github.com/IvanBoyd/IoT_Capstone-IvanBoyd)

**Brief:** My idea is to significantly expand, modify and refine the infinity mirrored-box which was my midterm project. The prime addition will be to provide a venue for individuals to present a personal doppelgänger inside the infinity box.

My midterm was a simple prototype that received both touch and movement input which it converted into varying light values and strobe effects on NeoPixels. It did not take advantage of NeoPixel’s ability to produce a wide range of differing colors nor were the NeoPixels composed artistically throughout the infinity box. The enclosure itself was made from foam core and completely lacked attributes of finish, such as the storage for components, the concealment of wiring and overall look and feel. This was a good starting point, but a revised version will have to address all these issues.

The capstone version of the infinity box involves a complete overhaul of the electronic components adding Adafruit DotStar Pixels in a 16x16 grid with 256 addressable pixels, a Garmin LIDAR Optical Distance LED Sensor, and possibly including a 100 NeoPixel Fairy Lights and a DotStar High Density 8x8 – 64 RGB LED pixel matrix and replacing the Teensy with a Particle Argon processor. These seemingly similar components all require their own libraries and programming differences. The display goals of each are radically different and the programming involved is not interchangeable.

Features:

* Infinity box that houses five acrylic mirrors and one two-way glass mirror to be enclosed in polished black acrylic with cut-outs for circuit boards, user adjustable features and power.
* The ability to receive images, such as selfies, from any Bluetooth device and project them in low resolution into the Infinity Box, creating a doppelgänger that will be recursively echoed until it fades from view. I haven’t decided if the infinity box will be sending anything back to the sending Bluetooth device, though I think there are intriguing possibilities here.
* The infinity box will be aware on two levels of movement in its general vicinity. First, any general movement that can be detected with broad detection sensors and secondly with highly directional movement approaching and receding from the infinity box. General movement will result in an apparent awakening of the infinity box, perhaps indicated by soft LED lights turning on or mildly pulsing. Movement directly in front of the infinity box will produce correlative light activity within the infinity box.
* Random lighting effects that occur when presence has been identified. I would like this to involve an exploration of the visual capabilities of Dot and Neo Pixels including color perception when a single Dot/Neo pixel pulses in different colors and how the color of neighboring Dot/Neo pixels affects and/or follows traditional color theory schemes like complementary and analogous.
* A thermo-sensor that responds to touch induced temperature changes by a different patterning of LED lights.
* OLED display that provide feedback on certain operational characteristics of the infinity box.
* Required parts list
* Standard breadboard, 22 g wires
* Particle Argon processor
* Adafruit NeoPixel LED Fairy Lights, 100 wired
* Adafruit DotStar high density 8x8 Grid – 64 RGB LED Pixel Matrix
* Adafruit DotStar Matrix 16x16 – 256 RGB LED Pixels
* Garmin Lidar v4 LED Ranging Module
* LED Encoder
* Adafruit SSD1306 OLED Display
* Adafruit BME 280 Temperature/Pressure/Humidity Sensor
* Five acrylic mirrors, one glass two-way mirror, black plexiglass