

Journal Entry #6

(11/01/21 -11/04/21)

What: I need to define some of the aspects of our prototype design based on our progress and brainstorm some ideas over the enclosure or the compartment for our hardware.

Why: If I do not outline ideas for our prototype designs such as its capabilities and its functionality, then we will not be able to construct a definitive design for our product. In addition, it will be aesthetically displeasing for our hardware to be seen instead of hidden in relation to marketability.

How: I plan to solve this by creating a general list of what should be included and what is in current development based on our progress for our prototype. In addition, I plan to brainstorm ideas on the overall design of the compartment for our hardware.

Capabilities of the prototype	Capabilities that will not be included within Prototype (current development)
At least 48 keys including the alphanumeric keys and 26 letters should contain capacitive touch sensing	Capacitive touch sensing for the entire USB keyboard
Output if a key has been touched or released through Arduino IDE based on the capacitive sensor	The onscreen keyboard application connected to our device through Microsoft Visual Studio
	Highlighting specific keys on the onscreen keyboard

Design Ideas for Hardware Enclosure/Compartment:

- The compartment could be constructed through 3D modeling which will require a lot of specificity based on the dimensions of each piece of hardware
 - The compartment could be modeled through Autodesk Tinkercad which is a free 3-D modeling software
- The 3-D printers at Wichita State University could assist in 3-D printing the model depending on the amount of filament and pricing
- The design will need to be able to hold the Arduino Nano, MPR121 12-Key Capacitive Touch Sensors, and any other additional hardware
- It will most likely need to be placed at the bottom of the keyboard since the wires need to tie directly underneath the individual keys of the physical keyboard

(11/08/21 -11/12/21)

What: I need to figure out how to create different addresses for multiple MPR121 Capacitive Touch Sensors connected to the Arduino Nano.

Why: Since we are using multiple capacitive touch sensors, we need to differentiate them for specificity so that the Arduino Nano can determine a capacitive touch pin based on the capacitive sensors' address and its pin number.

How: I am planning to solve this by doing some research through different websites such as the manufacturers website to collect some insight on how to construct an I2C address for another capacitive touch sensor.

Findings: I discovered that it is possible to construct a different address depending on the wiring of the capacitive touch sensor. For example, the default I2C address is 0 x 5A because the address pin on the sensor is pulled to ground. According to the Adafruit website, you can change the I2C address from the default of 0x5A to one of four other addresses by connecting it to one of the other pins:

ADDR > GND = 0x5A (default)

ADDR > 3.3V = 0x5B

ADDR > SDA = 0x5C

ADDR > SCL = 0x5D

References:

<https://learn.adafruit.com/adafruit-mpr121-12-key-capacitive-touch-sensor-breakout-tutorial>

<https://learn.adafruit.com/adafruit-mpr121-12-key-capacitive-touch-sensor-breakout-tutorial/wiring>