

## Work Package

The following tasks will need to be completed during Spring 2022 semester for the completion of our product:

### Software:

- Create Windows Desktop App through Microsoft Visual Studios
  - Since our onscreen keyboard will run through Windows OS, we will need to work on constructing the Windows app through Microsoft Visual Studios, so that the user can have access to the display the keyboard
- Design the onscreen keyboard within app
  - We will construct the layout of our onscreen keyboard using Visual Studio and Python
  - Next, we will apply different font types, font colors, font sizes, and background colors through Python
- Design a transparency tool for the onscreen keyboard to adjust the opacity of the keyboard
  - We will construct this tool using Python code to adjust the transparency of the object

### Hardware:

- Integrate 96 keys of the keyboard with capacitive touch sensing
  - For our device to function, we will need all 60% of the keyboard to have capacitive touch sensing
  - I will assist in this realm regarding the multiplexer known as the TCA9548A, which will allow to connect at least 8 MPR121 12-pin Capacitive Touch Sensors to our Arduino Nano, which will grant us the ability to individually wire 96 keys through each of the pins
- Design a compartment for all the hardware
  - Due to the limited space on our keyboard, we need a way to encase our hardware
  - I may need to use a 3-D software such as Tinkercad to design a custom compartment for all our hardware and 3-D print the model
  - It may have to be attached to the bottom of the physical keyboard since the wires will be under the keycaps
  - The compartment may contain holes so the wires can be free to connect to each of the keys
  - The holes will need to be a precise measure apart so that the insulation of the wires do not touch
  - The hole diameter will be dependent on the wire gauge
  - Modifications to the design will be inevitable depending on time

## Software and Hardware Integration:

- Integrate the onscreen keyboard with the capacitive touch keys from the Arduino
  - The capacitive touch pins from the MPR121 capacitive touch sensors will be connected to a specific key on the keyboard
  - We will have the data that is outputted from the Arduino IDE that expresses which capacitive touch pin has been touched synced to Microsoft Visual Studios
  - Once Microsoft Visual Studio reads this serial data, our written code can express in a binary fashion if a pin is touch or released, then it can be highlighted through the onscreen keyboard
  - The written code will have to be based on a function to detect which pin number is active from which specific capacitive touch sensor board
    - This will have to be based on the pin number, the capacitive touch sensor board address, and whether the pin is touch or released which will most likely be set as a Boolean function
  - Determine how to highlight the keys selected from the physical keyboard to the onscreen keyboard based on which pin is touched or released which will be related to the onscreen keyboard