Team Name: Techblazers

Date of Submission: 11/14/21

Meeting Date & Time: November 14, 2021, 2 – 5 pm

Meeting Location: Ablah Library, Room 232

Meeting Duration: 3 hours

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| --- | --- | --- |
| Team Members | X = Present | Notes |
| Victor Siooh | X |  |
| Chief Boateng | X |  |
| Slate Jordan | X |  |
| Emmitt Brandt | X |  |
| Chase Williams | X |  |

Progress:

Team accomplishments for the week: A short narrative, typically 1-2 paragraphs, should include decisions made by the team as a result of the team discussions, and how the team arrived at the decision.

We were able to integrate two MPR121 capacitive touch sensors with the Arduino Nano and test the functionality of the capacitive touch pins from each of the capacitive touch sensors. The Arduino IDE Serial Monitor was able to output whenever a pin had been touched or released by the user from either sensor. In addition, we defined the capabilities that our prototype will exhibit based on our timeline and the progress of our overall design leading into the 2nd semester.

Individual contributions: A brief narrative (1-3 sentences) made by **each team member** summarizing their respective activity for the past week.

Victor Siooh: I was able to contribute to the integration of the two capacitive touch sensors and the Nano by doing some research through different forums and websites about how to create different addresses for each of the sensors. In addition, I was able to assist in scheduling in-person meetings based on each team member’s schedule to start the production of our product’s prototype. I was also able to brainstorm a few ideas on the construction of our custom compartment for our hardware that will be attached to our physical keyboard.

Chief Boateng: Continued research on data collection from external boards to develop codes in Arduino, which is done using help from a library which has some pre-defined codes which can be edited to perform the changes to suit the project. Did additional research on the transition method in getting data obtained from the Arduino IDE to visual studios which involved the use of namespaces to call the code’s properties to be used within visual studios.

Slate Jordan: Soldered necessary components onto our Arduino/touch boards to test connecting multiple controllers over the I2C bus with different addresses. Brainstorming our options for grid vs individual sensor hookups as well as the logical flow of the project from hardware to software. Researching and finding materials like aluminum foil tape and wiring.

Emmitt Brandt: Brainstormed and discussed the method to use to wire the keyboard, and the various ways software could be used to help implement the method chosen. Discussed ideas for how best to create a covering for the new keyboard components, citing that I could CAD a new keyboard cover if need be. Researched ways grids of wires have been used in current membrane keyboards. Further researched feasibility of using a grid system with capacitive sensors for the project at hand. Discussed and explained how the application would be developed and what is needed to ensure all were on the same page in regards to the feedback from the Arduino.

Chase Williams: I researched and figured out how to allow multiple capacitive touch sensors to communicate with the Arduino Nano by adjusting the circuit and Arduino code. I found a solution to our problem of only being able to integrate 4 capacitive touch sensors with the Arduino Nano by using a multiplexer to give us the ability to use more sensors. I created a program that reads the serial data into a Python script from the Arduino Nano about which pin is being touched or released.

Project Tracking (current work): Assignments and activities are to be tracked until completed.

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| Team Member | Assignment | Due Date | % Complete |
| Victor Siooh | Brainstorm ideas for prototype design with Arduino Nano (further development) | 11/23/21 | 80% |
| Victor Siooh | Research the difference of capacitive touch sensitivity when a material such as aluminum is introduced with metal | 11/19/21 | 0% |
| Chief Boateng | Research on Serial Port Reading | 11/17/21 | 0% |
| Chief Boateng | Brainstorm/Research into method of using data obtained from Arduino code to build a function which reads in the data and indicates which key is pressed | 11/21/21 | 0% |
| Slate Jordan | Order Wire and Aluminum foil tape | 11/21/21 | 0% |
| Slate Jordan | Design for prototyping (active changes) | 11/17/21 | 75% |
| Chase Williams | Research how to integrate the multiplexer with the capacitive sensors and Arduino Nano. | 11/21/21 | 50% |
| Chase Williams | Update the Arduino Nano code to provide the output in the correct format for the keyboard app. | 11/17/21 | 33% |
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Plan (future work):

A brief description of the tasks and activities the team needs to accomplish work over the coming weeks. As team members pick up assignments, move from this table to the tracking table. Consider future work a running task-list with an expected due date for completion.

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| --- | --- |
| Assignment | Due Date |
| Order 2 more MPR121 Capacitive Touch Sensors for prototype design | 11/17/21 |
| Order aluminum tape | 11/17/21 |
| Order silicone wire | 11/17/21 |
| Test the capacitive touch sensitivity of a key with aluminum tape and silicone wire underneath the metal keycap | 11/23/21 |
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Issues:

Include a brief description of issues the team has encountered, and potential resolutions for the issues. If the team would like staff to help with the issues, this is the appropriate place to request assistance.

We were having trouble figuring out how we were going to approach sensing multiple keys based on our capacitive sensing grid method. We were planning to assign a specific value of capacitance for each row and each column, and the key that is selected would be based on the product of the capacitance value between the row and column. We realized that if we were to select multiple keys at the same time such as ‘Q,’ ‘W,’ ‘A’ and ‘Z,’ from different rows and different columns, it would be hard to isolate each character based on the capacitance value since all of them are different. If we attempted to collect the sum of the capacitance values of all these keys, then that would increase complexity because there would be so many combinations for any number of keys that are selected which would be difficult to pinpoint. Therefore, we decided to use a binary approach with each wire that is tied to the capacitive touch pins of the MPR121 capacitive touch sensors connected to an individual key for simplicity.

Include the schedule for the next meeting:

Meeting Date & Time: 11/21/21, 3 – 5 pm

Meeting Location: Teams