CS/EE 120B Custom Laboratory Project Report

Phone Controlled Fan

Shashwath Gunasekaran

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Introduction:

This project is a Bluetooth controlled fan, where the speed of the fan is controlled by my phone, which sends a signal to the Bluetooth module. There are three speeds: LOW, MEDIUM, and HIGH. Finally, the speed is displayed on a LCD.

Some errors that I ran into had to do with the Nokia LCD Screen. Whenever the fan would not spin, the NOKIA LCD outputted LOW, MEDIUM, and HIGH with no problems. Whenever the fan would spin, sometimes the LCD would not output anything, while other times it would output things with little to no problem.

A functionality that was not implemented was the button press, where the system would turn on if the button were to be pressed, and another button would be pressed to turn the system off. However, this functionality is trivial as it is not a complexity nor is it difficult to implement.

Complexities:

My three complexities are the Bluetooth Module, DC motor, and the Nokia 5110 LCD Screen. All of my complexities were implemented successfully.

User Guide:

In order to interact with the system, you would need to download the DSDTECH Bluetooth Application from the App Store on IOS. From there, you can send in a signal from 0-3 from your phone. Sending in a 0 turns off the system, a 1 sets the speed of the fan to LOW, 2 sets the speed of the fan to MEDIUM, and a 3 sets the speed to HIGH. The NOKIA 5110 LCD screen keeps track of the different speeds.

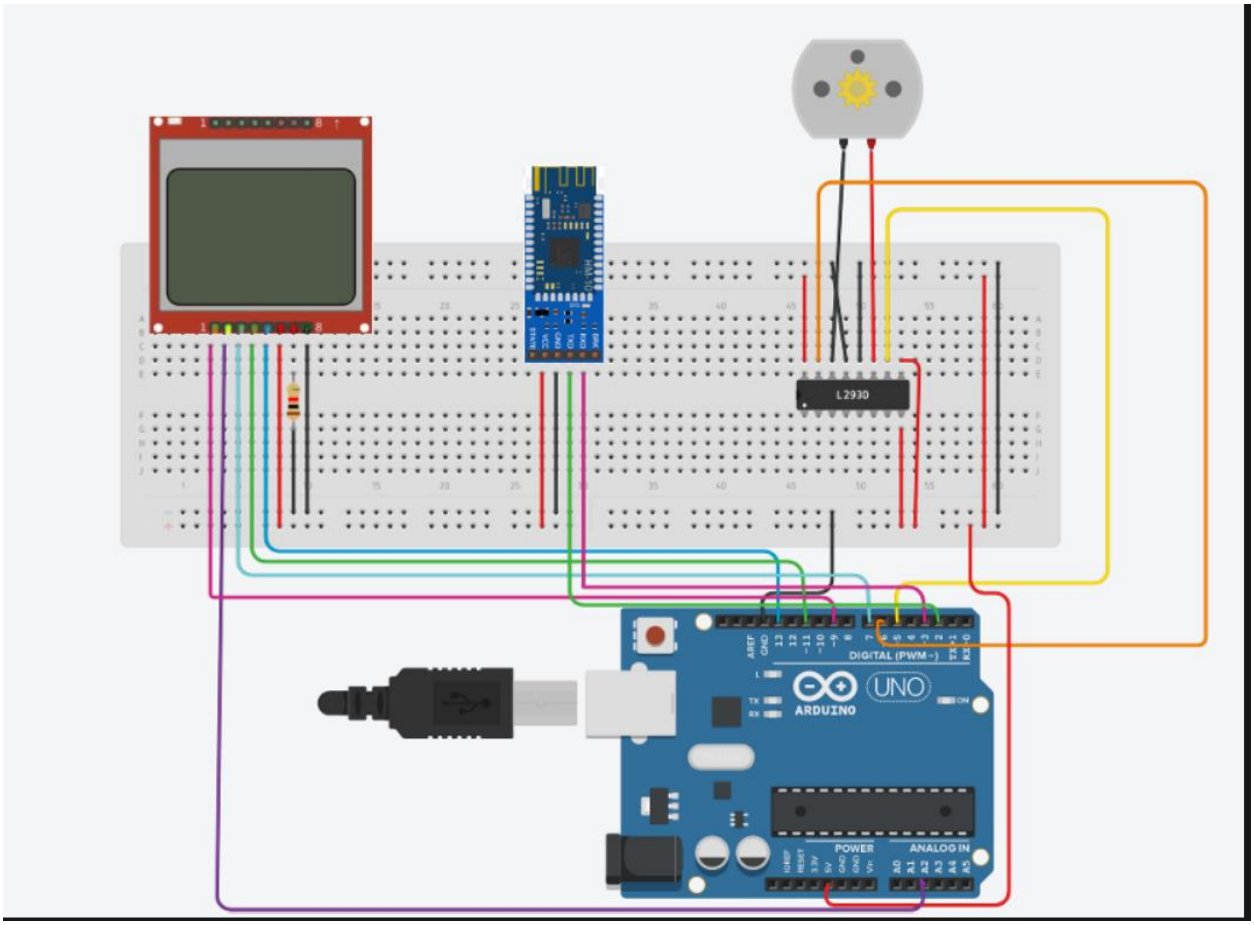
Hardware Components Used:

- Breadboard
- Jumper Wires
- 330k Ohm Resistors
- NOKA 5110 LCD Screen
- Bluetooth Module
- L293 Driver
- DC Motor

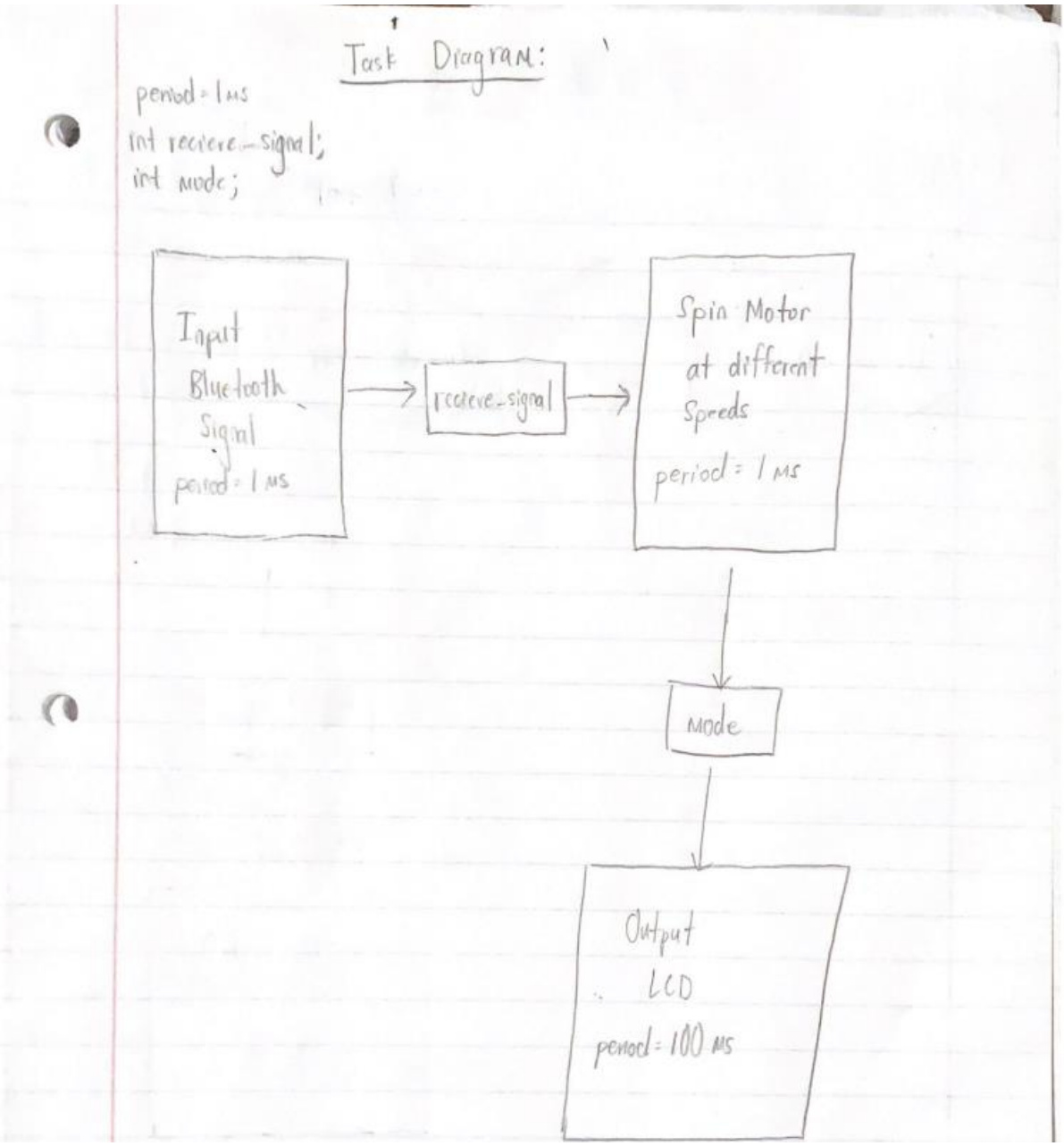
Software Libraries Used

- <SPI.h> library
    - This library made it possible to write to the NOKIA 5110 LCD Screen , specifically writing text to the screen in a much easier way, compared to not using this library. This library helped display LOW, MEDIUM, and HIGH.
- Software Serial library
    - This library made it less difficult to communicate between my phone and the Bluetooth module. More specifically, it was easier to send signals from my phone to the Bluetooth module. The incoming signal would determine how fast the fan will spin. This library was allowed by the TA to use.

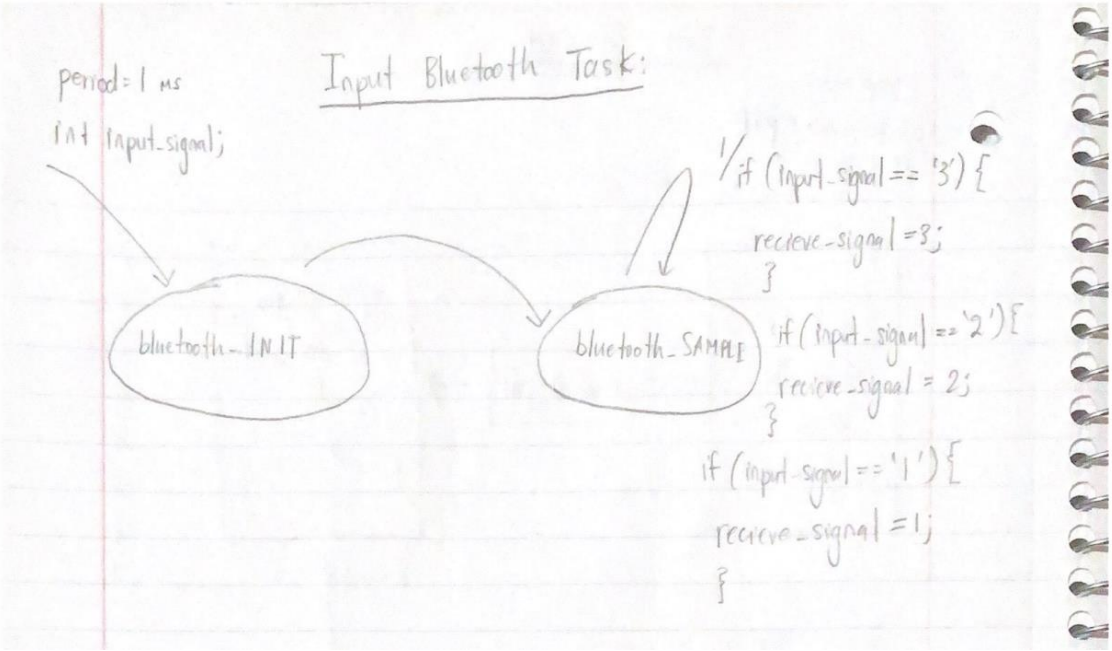
Wiring Diagram:



Task Diagram:



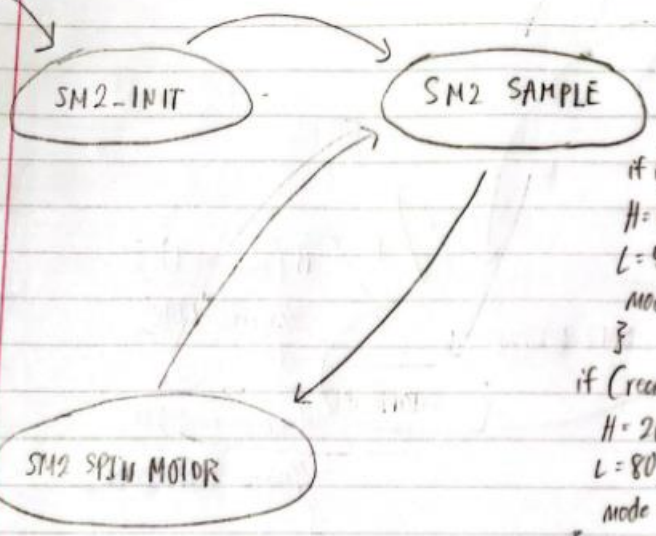
SynchSM Diagrams:



Spin at Different Speeds Task:

period = 1ms

```
int H;   int count = 0;
int L;   int count1 = 0;
```

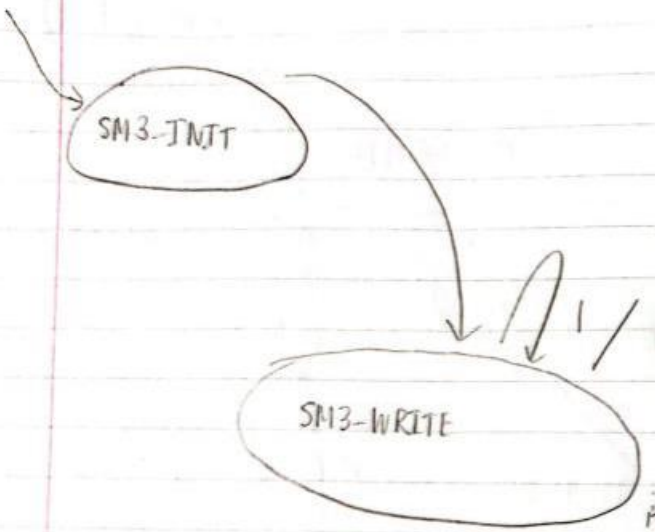



```
if (count <= H) {
  digitalWrite(pin1, High);
  count++;
}
else if (count > H) {
    if (count1 <= L) {
        digitalWrite(pin1, LOW);
        count1++;
    }
    else if (count1 > L) {
        count = 0
        count1 = 0,
    }
```

```
if (recieve_signal == 3) {
    H = 90;
    L = 10;
    mode = 3;
}
if (recieve_signal == 2) {
    H = 60;
    L = 40;
    mode = 2;
}
if (recieve_signal == 1) {
    H = 20;
    L = 80;
    mode = 1;
}
if (recieve_signal == 0) {
    H = 0;
    L = 100;
}
```

period = 100 ms

Output LCD (NOKIA)




```
// if (mode == 1) {
   //write "LOW";
   }
if (mode == 2) {
   //write "MEDIUM";
   }
if (mode == 3) {
   //write "HIGH";
   }
```