

## Project Proposal: Smart Watch

### Overview

The goal of this project is to construct a smartwatch with multiple faces that perform different functionalities. We will be using the HiLetgo SPI LCD Display to display different watches faces, and the watch faces can be switched via the button on the board. Face 1 will be displaying the current time. Face 2 will be displaying the current temperature, where the temperature information is obtained from the temperature sensor. Users can also display any text on watch face 3 by entering a string of text on the PC terminal, which will be transferred through UART.

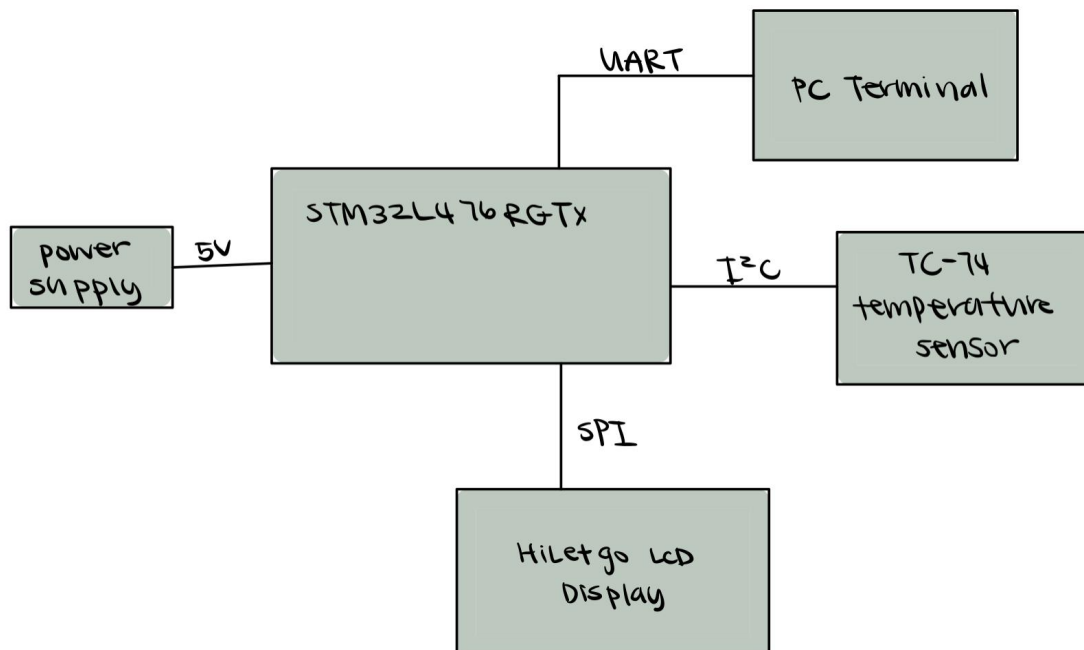
### Peripherals

- HiLetgo ILI9341 SPI LCD Display
- TC74 Temperature Sensor

### Serial Interface protocols

- SPI for the display
- I<sup>2</sup>C for the temperature sensor
- UART to transfer text from termite to the watch

### Block Diagram



## **Group Responsibilities**

- Omkar will be in charge of the UART interface
- Kelly will be in charge of the I<sup>2</sup>C interface
- Kelly and Omkar will work together on interfacing with the HiLetgo Display

## **Software Structure**

We will be implementing a smartwatch that has different functionalities that can be switched via the button on the board. Below, we will describe each of the functionalities, which will be displayed as sequential watch faces.

### Face 1:

This is the default face that appears when the reset button is pressed. It will simply display the current date and time, and it will be constantly updating the time using the RTC and the alarm interrupt on the board.

### Face 2:

This face will be switched to when the push button is pressed. It will display the current temperature using the TC-74 temperature through I<sup>2</sup>C, updating every 10 seconds, using the SysTick interrupt.

### Face 3:

The user can customize this face by entering any text that they want to display on a PC terminal. The text will be transferred to the board through UART, and then show up on the display through SPI.

## **Goals**

- Week 1: Set up the temperature sensor, UART, and the display
- Week 2: Learn about generating text on the display, and work on interfacing with it
- Week 3: Set up interrupts and make sure that information is displayed accurately and updated frequently
- Finals Week: Work on the demo video
- Add another watch face (if we have enough time)

## **Website**

<https://sites.google.com/view/153bfinalproject/home?authuser=0>