**Smart Watch Specifications**

* Measures heart rate using PPG sensor
* Uses accelerometer to count steps
* Keeps track of time
* Uses SD card to keep track of step, HR data, and time
* Recharges using microUSB port
* Displays time, step, HR, connection status, battery percentage, incoming notifications using screen
* Uses Bluetooth to connect to phone and update info based on phone status and receive incoming messages and calls

**Firmware** (C, C++, Signal Processing, Communication protocols, Arduino)

* Measuring heart rate
* Measuring / counting steps
* Keeping track of time / setting it (RTC and update via BT)
* Writing and reading from SD card
* Recharging capability and battery percentage
* Program screen to display information (HR, steps, time, battery percentage, connection status, incoming notifications)
* Bluetooth (initialization, communication, CRC)

**Hardware** (PCB design (EAGLE), circuit design, digital/analog instrumentation use, consulting)

* Develop breadboard prototype
* Develop THT PCB board
* Shrink layout to fit on wrist - consulting, PCB printing, EAGLE

**Software** (mobile/web development (JAVA, JavaScript, Python), communication protocols)

* Develop mobile application to interface with watch and send notifications, receive updates, send commands
* Develop web application for viewing statistics and trends

**Mechanical** (CAD (SolidWorks), machine shop, technical drawing)

* Setup test rigs for measuring and testing PPG and accelerometer modules
* Design LFP, MFP (machine shop, printing) to test compatibility of design
* Design HFP using precise CAD for casing final design

**Possible Future Iterations**

* Switch to BLE (BLE112)
* Temperature reading
* Data acquisition via serial port
* Buttons / switching screen/ options
* Vibrating on notifications (motor)
* Update watch FW with SD Card
* App bugs / new app / web app
* Better screen
* Device keeps track of missed calls / texts
* Better power management

-> sleep mode - wakes up when wrist is flicked

-> turn on and off BT

* Better mechanical design
* Portable charging
* GPS
* Restart steps on new day

BUGS

* Random error messages