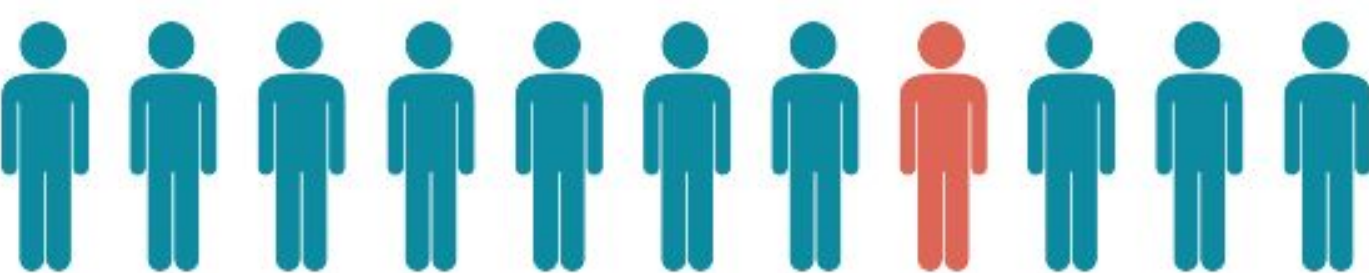


The Impact of Diabetes

- Over 400 million cases reported globally
- 30.3 million Americans (9.4%) have diabetes
- 1.5 Million Americans are diagnosed each year
- Diabetes is the 7th leading cause of death in the U.S

1 in 11 adults have diabetes (415 million)

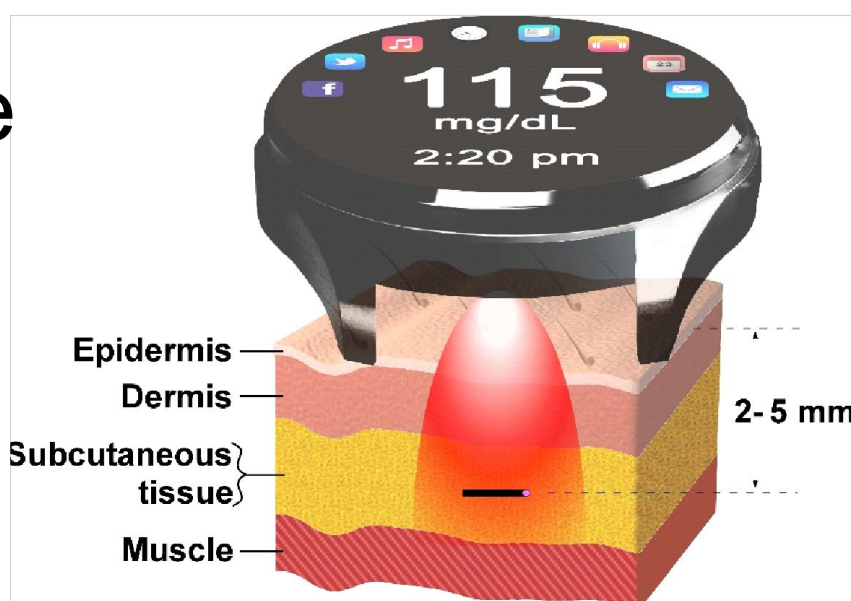


Our Objective

- Create and revise a smartwatch, able to interface with Biorasis's low power implantable sensor.
- Decrease watch size and make internal design more modular for future revisions.
- Increase functionality and accuracy

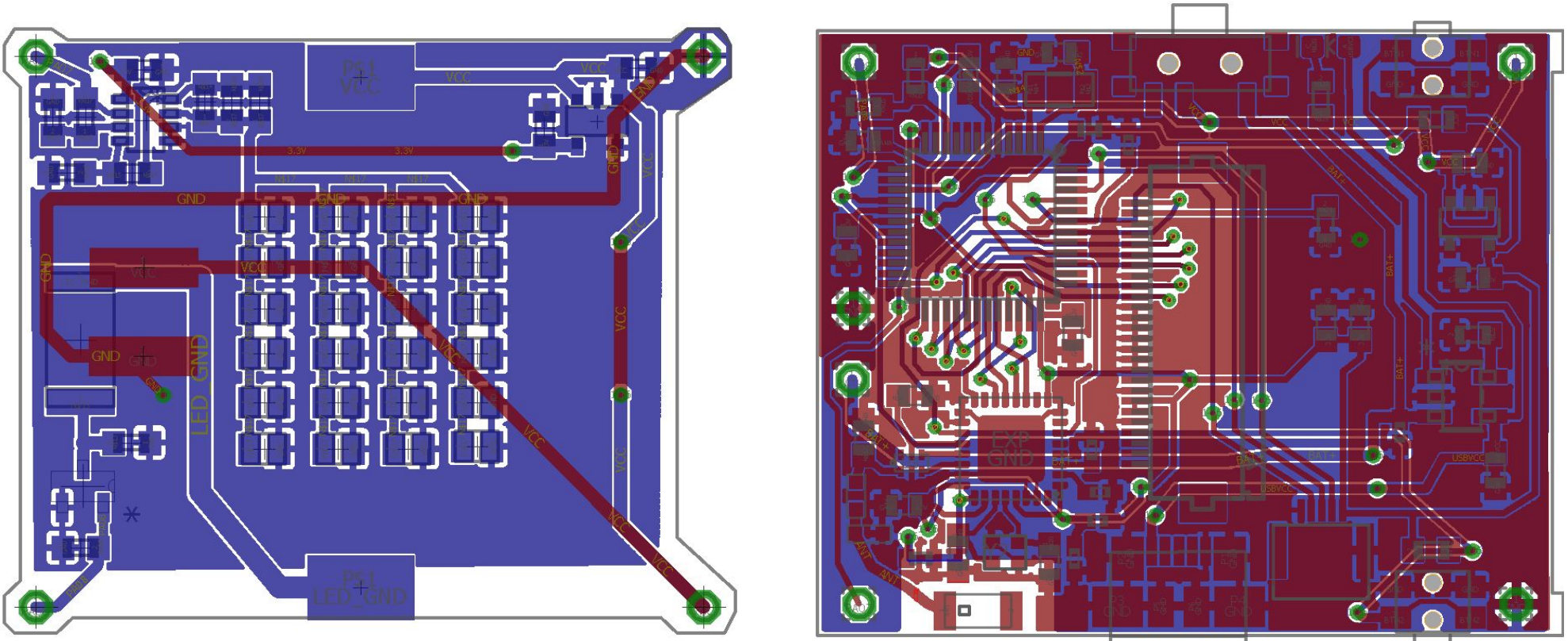
Project Components

- Transition from Arduino to an embedded Processor
- Upgrade display size and functionality
- Rebuild and add code to function with new MCU
- Design PCB's for more modular, compact design
- Design more robust enclosure



PCB Design and Implementation

- PCB's were designed using a modular approach
- Total functionality is split into two boards, a processing board and measurement board
- Measurement board interacts with implanted sensor to gather glucose readings
- Processor board parses information from measurement board and drives the entire watch

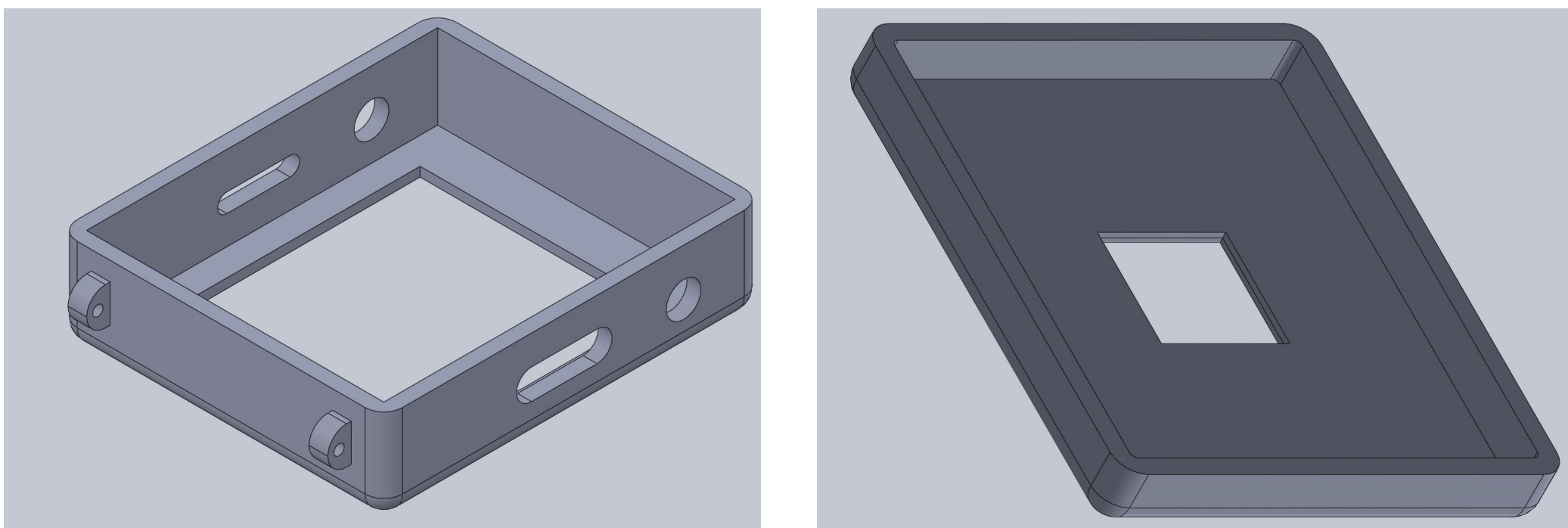


Code and Bluetooth Connectivity

- Two push buttons used for user input and control
- Accurate date, time, and battery level is displayed
- Smartphone app communicates with the smartwatch using a Bluetooth Low Energy device
- Watch will enter sleep mode during inactivity



Watch Enclosure



- New enclosure to accommodate larger screen and additional functionality
- Holes for push buttons, charging port, and on/off switch make new features easily accessible
- Robust design and magnetic band is aesthetically pleasing while maximizing viewing area and efficiency

Results

- PCB allowed us to decrease size while increasing functionality
- MCU and software have decreased power consumption, while improving speed and display readability
- Enclosure accommodates additional functionality, while remaining aesthetically similar to other watches on the market

Conclusion

As a team we were able to meet and exceed the requirements from our sponsor. Newly designed PCBs have made the overall watch design modular, a necessity for future adaptation/revisions. Our custom software takes full advantage of the new MCU. Enclosure fitment is refined and comparable to successful smartwatches on the market.