Johnson & Johnson MEDICAL DEVICES

Dave Pleteau

Embedded Engineer CO-OP

Manager: Eduard Grinberg/Jim Saffle/Cedric Beausse/Pedro Miguel

About Me

- Haiti
- Rising 3rd Year Northeastern
- CSCE → ECE
- 1st CO-OP
- Sweater weather 75% year

Major Projects

- Jira Issues Parser
- Jira Issues Parser Documentation
- STM Camerascope Handpiece Firmware and Hardware Design
- STM Camerascope Handpiece Firmware and Hardware Documentation

Jira XML Parser (GUI)

- Objective:
  - Extract and store essentials attributes of Jira issues to increase team efficiency in storing and managing projects and tasks
- Design Spec:
  - User-friendly Interface
  - Convenient Storing and Displaying Method (Excel)
  - Usable by any teams within workplace

Jira XML Parser (GUI)

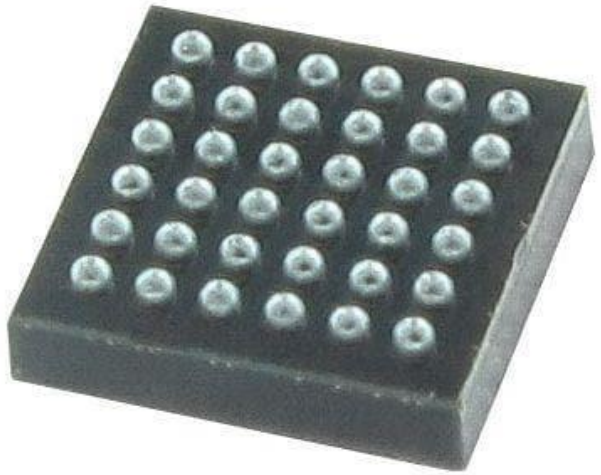
- Challenges:
  - Learning Visual Basic and Python
  - Good Coding and GUI designing Practices

STM Camerascope Handpiece

- Objective:
  - Iterated the Camera Scope Handpiece's firmware and hardware functionalities with an STM MCU to reduce the total cost of project
  - Design Specs For MCU:
  - Same or better features than Atmega328P
  - Reduced footprint

STM Camerascope Handpiece

- STM32L051T8Y6TR
  - ↑ Memory
  - ↑ Peripherals
  - ↑ Processing Speed
  - ↓ Instructions per Operations
  - ↓ Price



STM Camerascope (Software)

- Firmware Responsibilities:
  - Button Press
    - Use GPIO to poll and read button presses to initiate commands
  - Rotation
    - Use ADC to read orientation of camera
  - Communication
    - Use I2C peripheral to communicate information with master device

STM Camerascope (Software)

- Challenges:
  - Deciphering Datasheets
  - MCU firmware design
  - Best Coding Practices
  - Object-oriented programing

```
/**
* Code Readability
*/
if (readable()) {
    be_happy();
} else {
    refactor();
}
```

STM Camerascope (Hardware)

- Hardware Responsibilities:
  - Iterated circuit and PCB design to replicate the hardware functionality of the current handpiece
  - Conducted new power allocation and thermal analysis on design
  - Designed PCB layout

STM Camerascope (Hardware)

- Challenges:
  - Deciphering Datasheets
  - Fundamentals of designing circuit schematics and PCB layouts
  - Learning PCB Editor/Capture CIS

Acknowledgement

Thank You