Instrumentation Team Project Proposal

Timothy Byers, Cristina Felicitas, Allie Kim

Timothy Byers

- Junior
- CENG
- Firmware
- Previous Projects:
  - Arduino Design Project (296)
  - Smart Water Heater (396)
  - Android Application programming
- Personal Goals:
  - Learn to develop a GUI
  - Gain more experience with Python
  - Effective use of version control

Cristina Felicitas (Cris)

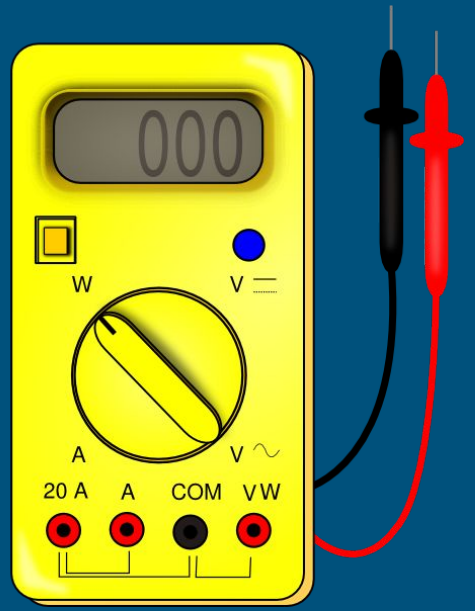
- Senior
- EE, EP Track
- Hardware
- Previous Projects:
  - Micromouse (296)
  - Green Energy Challenge (396)
  - Formula SAE
- Personal Goals:
  - Prototyping versus Designing
  - Learn how to design PCBs
  - Gain experience with Arduino

Allie Kim

- Junior
- CENG
- Software
- Previous projects:
  - Micromouse (296)
  - Android application programming (396)
- Personal goals:
  - GUI development
  - Effectively use GitHub
  - Gain experience using Arduino

Overview of Project: Current Voltage Logger

- In-house, open sourced data current and voltage logger
- Motivation:
  - Want to test other devices made from SCEL
  - Mainly the XBEE
- Purpose:
  - Collect current and voltage readings over various time intervals
  - Transmit collected data to a computer
  - Create interface for saving, browsing and collecting data sets

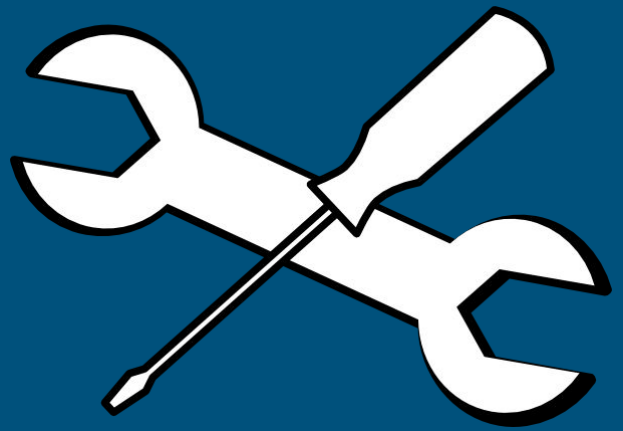


Goals for the Semester

- Working prototype of the CVL
- Accurately read the voltage/current out of another device and log measurements
- Documentation

Hardware Approach

1. Research hardware options
2. Learn necessary tools:
    a. Eagle
    b. PCB Milling Machine
    c. Arduino
3. Block Diagram
4. Prototype with Arduino
5. Prototype with Bare Arduino
6. PCB Design
7. Refine hardware design
8. Debug and test with firmware



Software Approach

1. Research GUI building tools (Qt/Glade)
2. Create/Design GUI (Glade)
3. Work on firmware to communicate with GPIO
4. Work on firmware to software communications
5. Debug and optimize software and firmware
6. Debugging and verification of product

Gantt Chart

	Project (Gantt Chart)															
Week	1	2	3	4	5	6	7	8	Spring Break	9	10	11	12	13	14	15
Date	1/25/2016	2/1/2016	2/8/2016	2/15/2016	2/22/2016	2/29/2016	3/7/2016	3/14/2016	3/21/2016	3/28/2016	4/4/2016	4/11/2016	4/18/2016	4/25/2016	5/2/2016	5/9/2016
Presentations																
Proposal																
Design Review																
Critical Design Review																
Demonstration/Final Presentatio																
Training																
Git/GitHub																
Arduino/Bare Arduino																
Eagle																
Hardware																
Research Options																
Access to FabLab/Project Room																
Block Diagram																
Prototyping with just the Arduino																
Design PCB																
Print Out PCB																
Test PCB/Verfication																
Refine hardware design																
Software																
Research GUI building tools																
GUI (Glade)																
Firmware																
Optimize and debug																
System Integration																
Test																
Software Verification																
Hardware Verfication																
Debug entire system																
Reports																
Final Report																

Potential Problems

- New project with limited documentation
- Integration of systems
- Time constraints

Learning Expectations

Hardware:

- Arduino
- PCB Design
- Use of Eagle
- Use of PCB mill
- Create a user manual (documentation)

Overall:

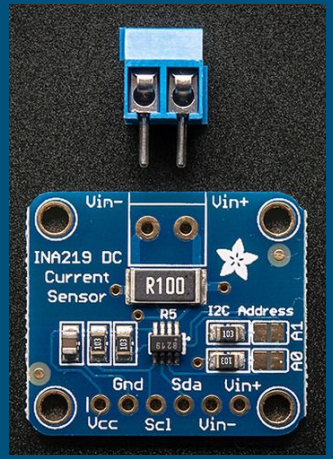
- Documentation
- Project planning
- Team work

Software/Firmware:

- GUI design
- Arduino microcontroller programming
  - ADC's
- Arduino serial communications

Team’s Current Progress

- Hardware:
  - Researched parts for the CVL
    - Found INA219 Current Sensor Breakout
  - Downloaded necessary software tools
  - Parts don’t need to be ordered
  - Started prototyping with Arduino
- Software:
  - Researched
    - Identified pySerial and pyGTK libraries to use
  - Began working with Glade



Thank you!

Questions?