

SIEMENS

Team 14 – Interim Design Review

Solar Powered Wireless Infrared Monitoring System

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Presentation at a Glance

Project Background

- Need & Goal Statement
- Objectives
- Sub-System Integration
- System Design & Scope

Prototype Progress

- Power System Status
- Monitoring System Status
- Problems Encountered

Conclusion

- Project Schedule
- Summary
- Questions

Project Background

Need & Goal Statement • Objectives • Sub-System Schematic • System Design

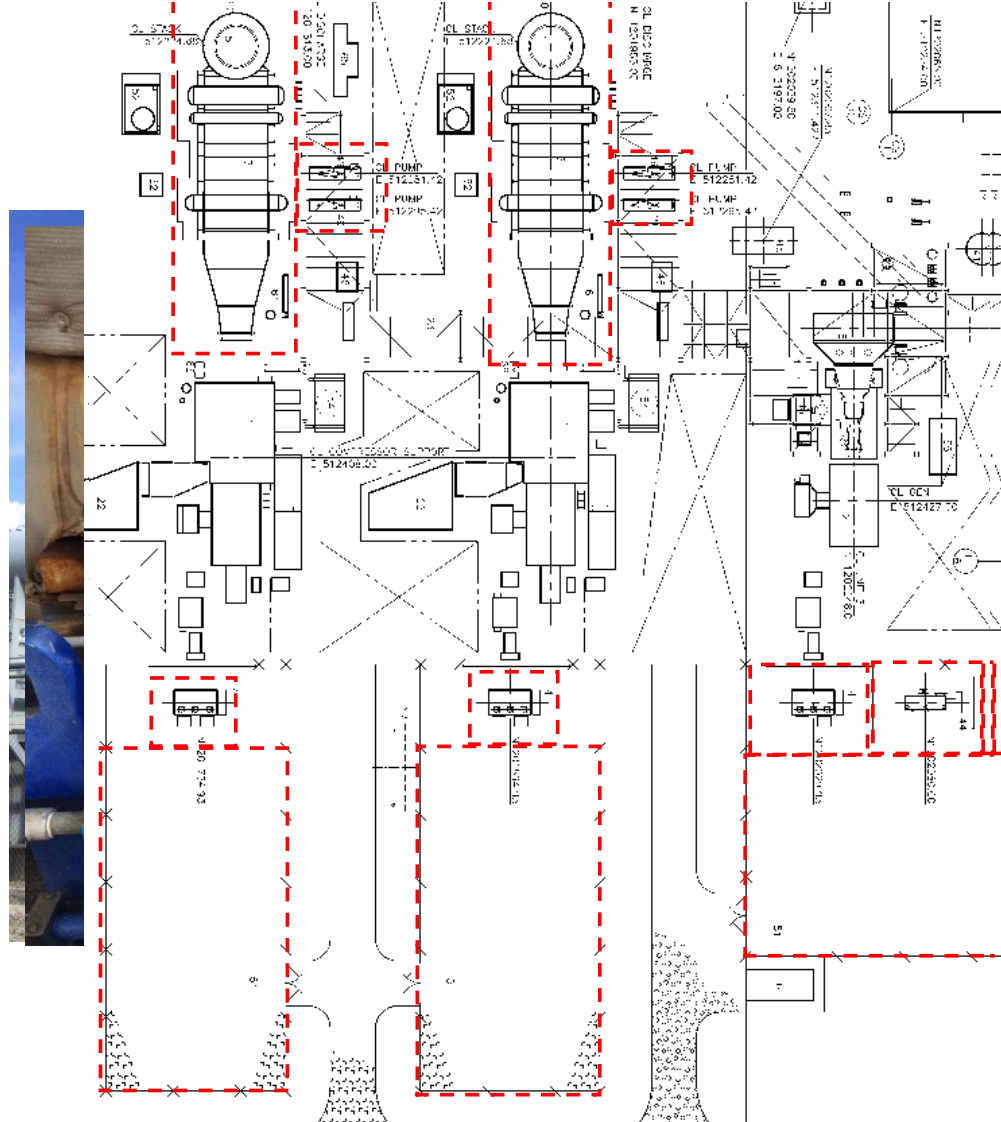
Need & Goal Statement

Needs Statement

There is a need for an improved method of monitoring critical equipment under operation in power plants.

Goal Statement

Design a proposed complete system that can monitor a wide range of equipment for problematic operation.



Objectives

1. Decrease equipment interference on operating systems.
2. Decrease manual work needed for preventative maintenance.
3. Design a stand-alone system that does not consume any plant power.
4. Reduce cost by eliminating the need for numerous existing systems.

Infrared
Camera

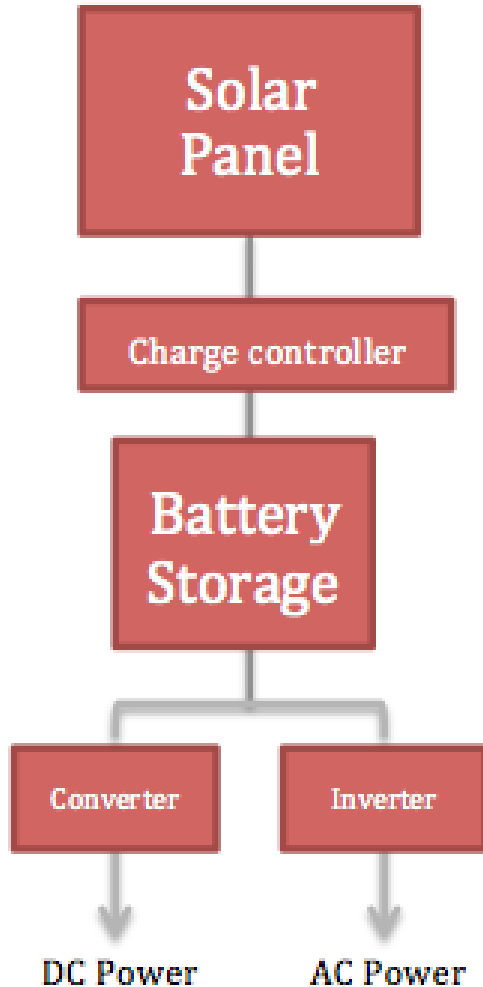
Pan Tilt
Module

Solar &
Battery
System

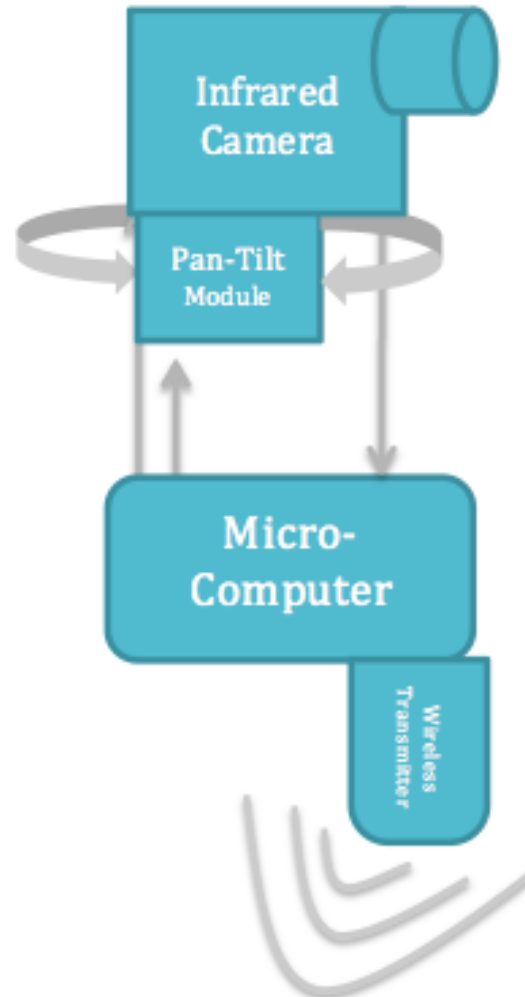
Wireless
System

Sub-System Integration

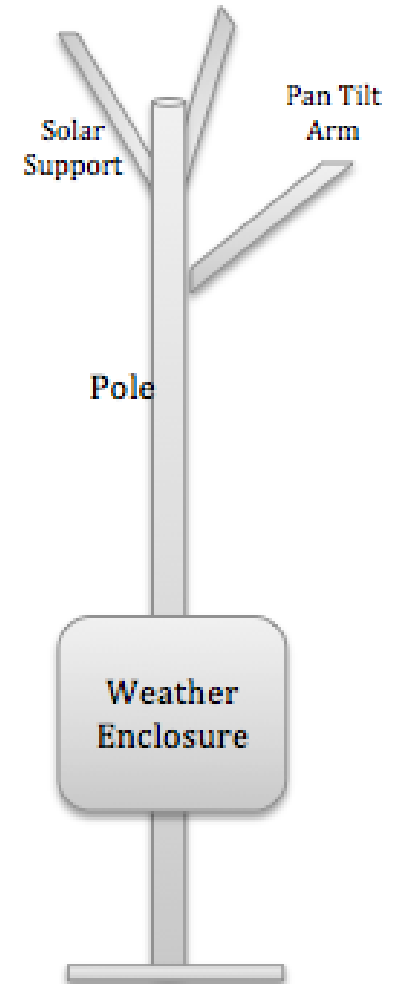
Power System



Monitoring System



Mounting System



System Design & Scope



prototype of the monitoring
tems.



FLIR IR Camera



Axis Pan Tilt

Remote 150W Panel
targets will be
positions.

emit infrared images of selected
system cycles through preset



Goal



MPPT Controller
targets are
situations



100Ah Battery

er Interface and alarm
ion received from
hen problematic



Versalogic Board



Wireless Adapter

Power System Progress

Accomplishments • Problems Encountered • Testing

Power System Status

Accomplishments

- Test rig assembled
- Two 24 hours tests
- Battery discharge test
- Data analysis

Problems Encountered

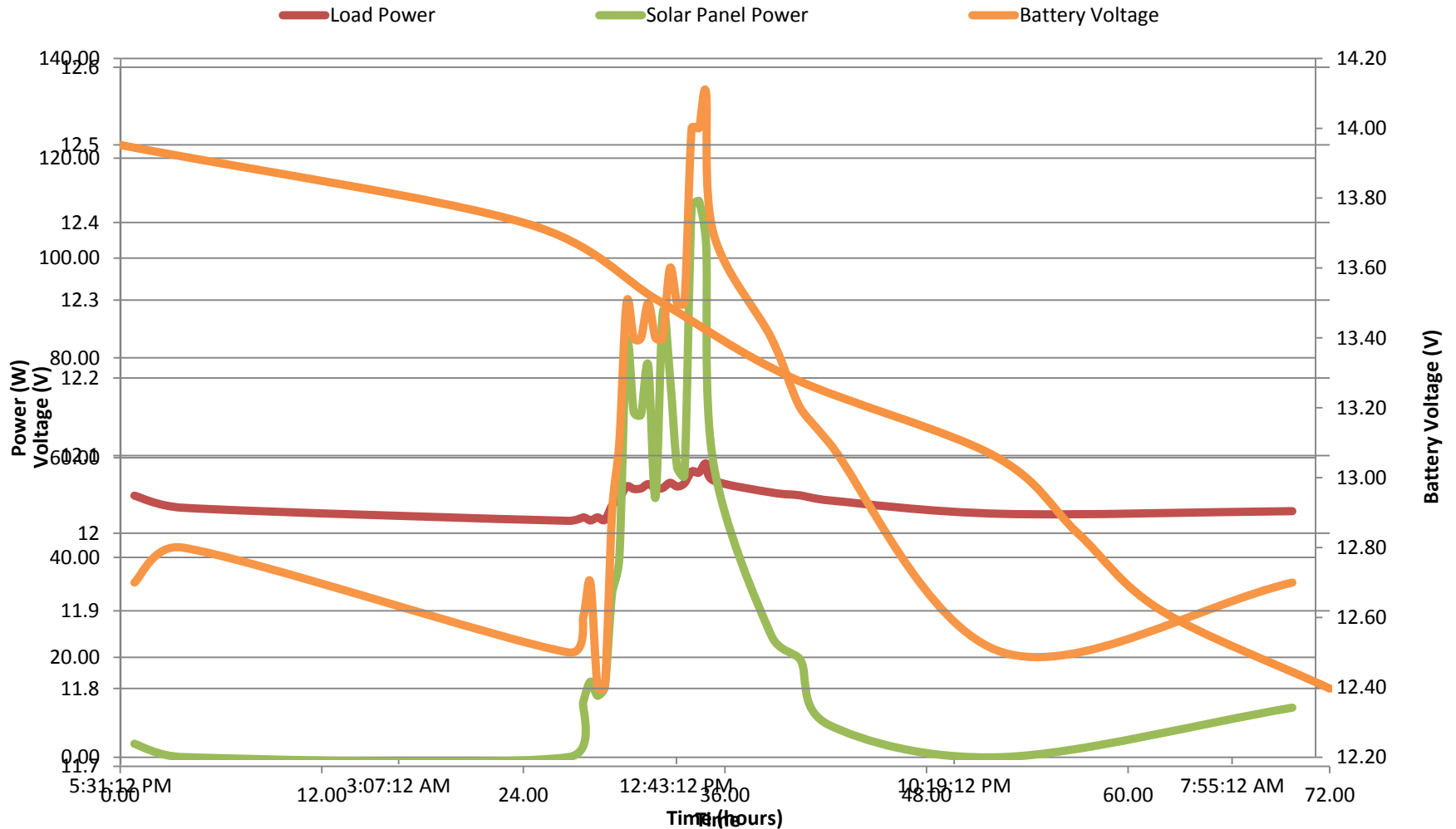
- Charge controller fuse
- Energy analyzers burned out
- Data collection



Power System Assembly

Power System Testing

Battery Discharge



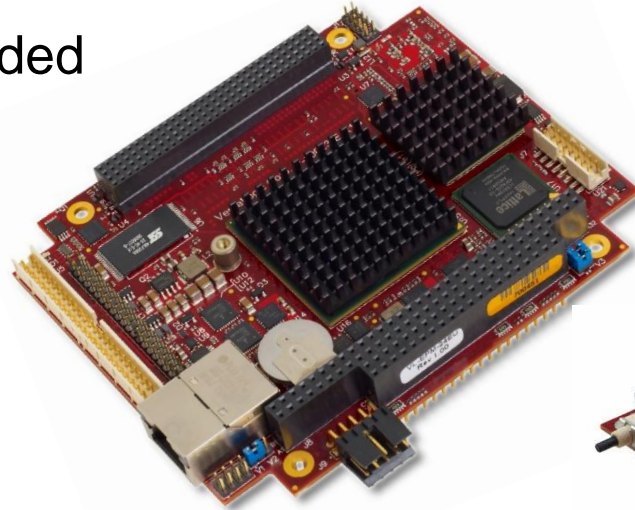
Monitoring System Progress

Accomplishments • Problems Encountered • Testing

Microcomputer Status

Accomplishments

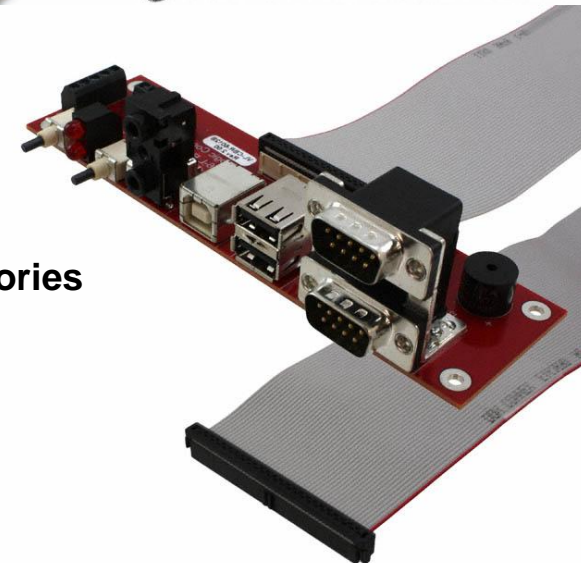
- Necessary programs loaded
 - Windows 7
 - Flir SDK
 - C++ Compiler
- Fully operational



Tiger Versalogic & Accessories

Problems Encountered

- Procurement of necessary parts



Camera Programming Status

Accomplishments

- Camera-microcomputer interface
- SDK installation
- On-screen temperature data

Problems Encountered

- Automated picture extraction
- Analyze function duration



FLIR A655 camera
Captured infrared image

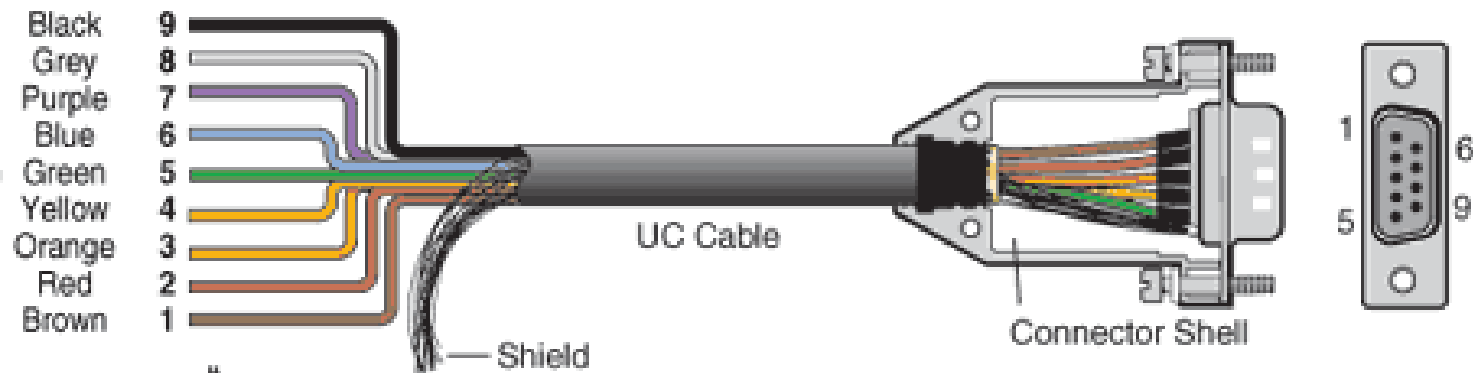
Pan Tilt Programming Status

Accomplishments

- Determined wire configuration
- Sourced Pelco D protocol C++ implementation
- Established movement by command
- Successful microcomputer integration

Problems Encountered

- Initializing communication port
- Specified position



Pan Tilt Programming Status

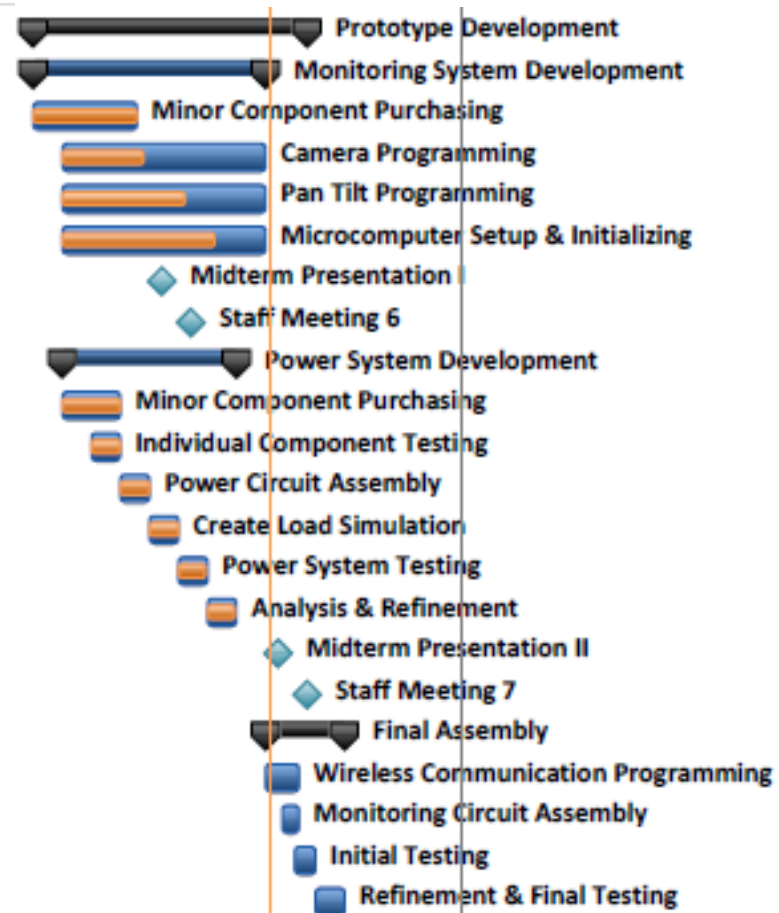


Conclusion

Moving Forward • Summary • Questions

Moving Forward

Prototype Development	66 days	Mon 1/19/15	Thu 3/26/15
Monitoring System Development	56 days	Mon 1/19/15	Sun 3/15/15
Minor Component Purchasing	25 days	Mon 1/19/15	Thu 2/12/15
Camera Programming	49 days	Mon 1/26/15	Sun 3/15/15
Pan Tilt Programming	49 days	Mon 1/26/15	Sun 3/15/15
Microcomputer Setup & Initializing	49 days	Mon 1/26/15	Sun 3/15/15
Midterm Presentation I	0 days	Thu 2/19/15	Thu 2/19/15
Staff Meeting 6	0 days	Thu 2/26/15	Thu 2/26/15
Power System Development	42 days	Mon 1/26/15	Sun 3/8/15
Minor Component Purchasing	14 days	Mon 1/26/15	Sun 2/8/15
Individual Component Testing	7 days	Mon 2/2/15	Sun 2/8/15
Power Circuit Assembly	7 days	Mon 2/9/15	Sun 2/15/15
Create Load Simulation	5.95 days	Mon 2/16/15	Sun 2/22/15
Power System Testing	7 days	Mon 2/23/15	Sun 3/1/15
Analysis & Refinement	7 days	Mon 3/2/15	Sun 3/8/15
Midterm Presentation II	0 days	Thu 3/19/15	Thu 3/19/15
Staff Meeting 7	0 days	Thu 3/26/15	Thu 3/26/15
Final Assembly	19 days	Mon 3/16/15	Fri 4/3/15
Wireless Communication Programming	8 days	Mon 3/16/15	Mon 3/23/15
Monitoring Circuit Assembly	4 days	Fri 3/20/15	Mon 3/23/15
Initial Testing	5 days	Mon 3/23/15	Fri 3/27/15
Refinement & Final Testing	7 days	Sat 3/28/15	Fri 4/3/15



Summary

- **Project:** Solar Powered Wireless Infrared Monitoring System
- **System Design:** Monitoring, Power, and Mounting System
- **Prototype:** Monitoring and Power System Proof of Concept
- **Status**
 - Power System: 97%
 - Monitoring System: 64%
 - Camera: 40%
 - Pan Tilt: 60%
 - Microcomputer: 75%
- **Upcoming Work**
 - Finish Camera and Pan Tilt Programming
 - Full Monitoring System Assembly & Testing
 - Final Reports & Presentations



QUESTIONS?

www.eng.fsu.edu/me/senior_design/2015/team14