Progress Report

EML 4552C – Senior Design – Spring 2012 Presentation

Team # 19

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Google Mobile App for Compressor Performance (GE)

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Project Sponsor

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Scope of the Project

- Customer Needs
  - Transfer data wirelessly to an Android phone.
  - Assembly time less than 5 minutes.
  - No modifications to pipes; non-intrusive method.
  - Software must collect, store and display data.
  - Working Demo.

Status Update: Sensors

- Currently reverse engineering Fuji sensors
  - 2 MHz
- Remove test data from unit
- Create data sheet
  - Sensor spacing
  - Calibration
- Test signal burst method

Status Update: Flow Analysis

- Flow Rate: Specifications to meet

$$\upsilon_{measured} = V_{measured} * A_{pipe}$$

- PV Curve: If specs not met, used to help diagnose problem in compressor
  - Obtain Pressure from Velocity Measurement. General Principle:

$$q = \frac{1}{2}\rho V^2$$

  - Volume known from compressor dimensions
- Efficiency:

$$\eta = \frac{\upsilon_{measured}}{\frac{\pi}{4} * bore^2 * stroke * rotational\ speed}$$

Status Update: Microcontroller

- Configuring OS for real-time threads and easier network access through SSH
- Setting up for wireless connection to phone
- Coding small program to send sample data to phone

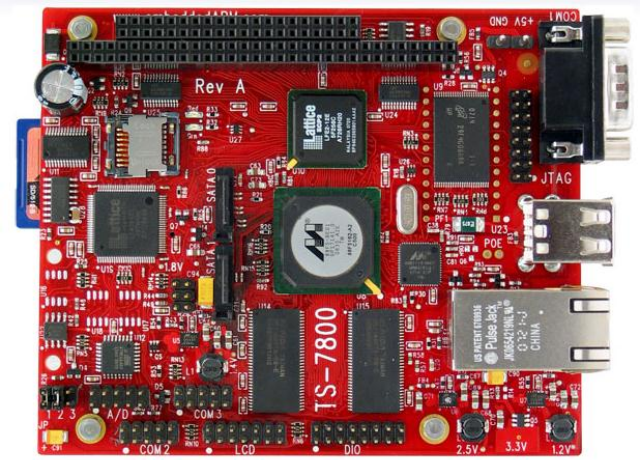


Image by:
http://www.embeddedarm.com/images/boards/medium/ts-7800.gif

Status Update: Application

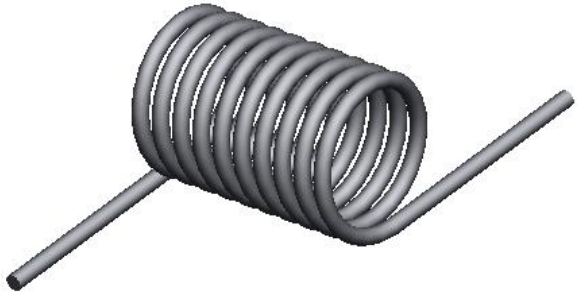
- Application GUI framework up and running
- Initial database coded
- Setting up for wireless connection to microcontroller
- Once receiving sample data start testing and modifying database if needed
- After database is fully functional can start coding calculations and modifying plotting function to correctly display PV graphs

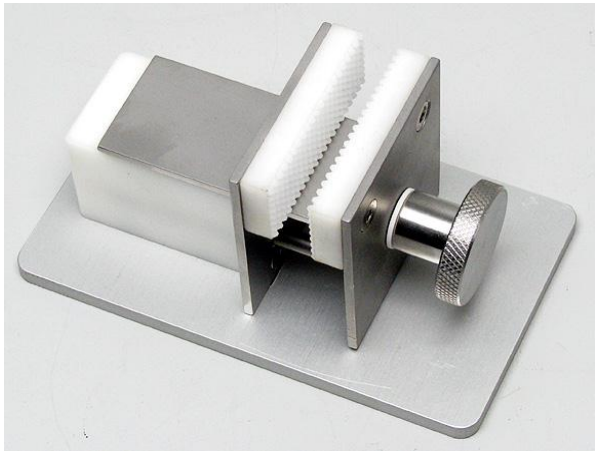
Image by: http://androidplot.com/header/images/upperlogo.jpg

Image by: http://lh3.ggpht.com/-YklDCK49g3Y/TxXg4CCV-ZI/AAAAAAAAARk/_J6nbIrI7go/LG-Optimus-Black-P970_Android-AM_thumb%25255B3%25255D.jpg?imgmax=800

Status Update: Mounting System and Housing

- Mounting System is completed
- Attaching the housing unit to the track, is being analyze
  - Torsion spring
  - Screws (Vise)





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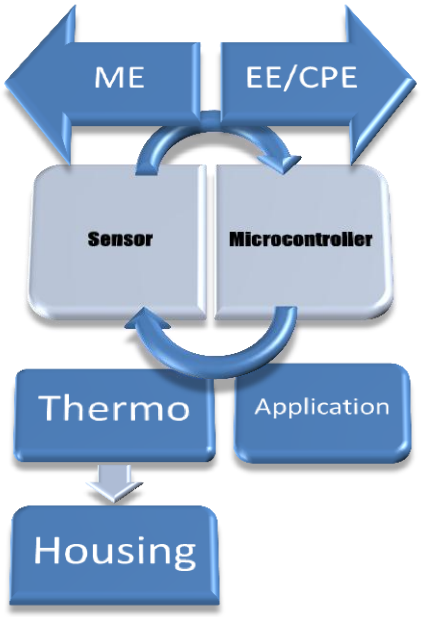
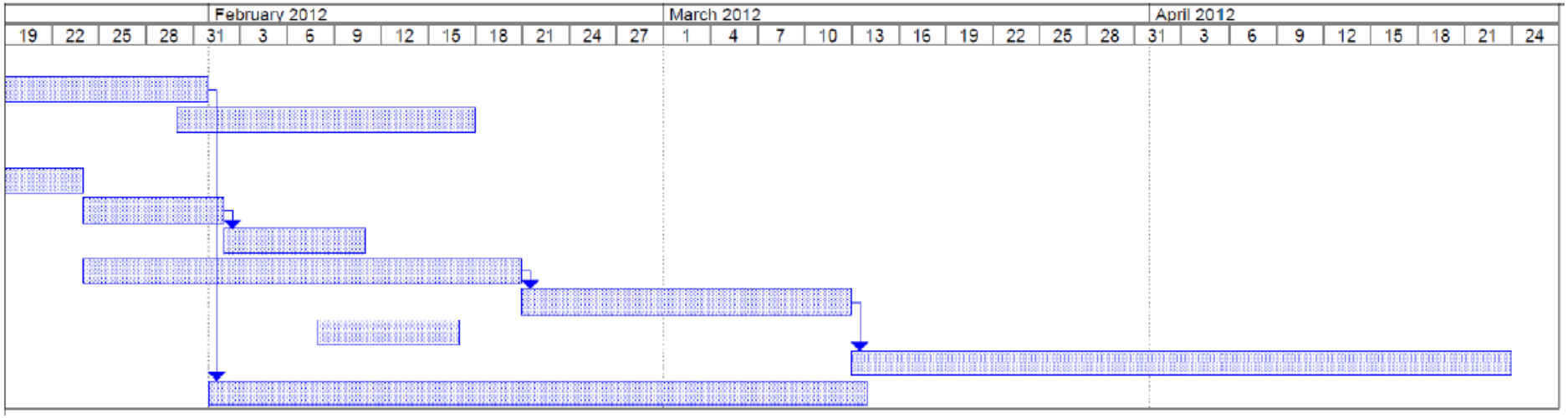
Summary - Plan of Attack

- Work on project segments then combine to make a whole product
  - Sensors
  - Housing
  - Thermodynamics
  - Microcontroller
  - Application
- Modular Design
  - Develop and interface components
- Test and calibrate system
- Modify system for portability and demonstration purposes



Spring Schedule

ID	Task Name	Duration
1	Configure Linux OS on SBC	6 days
2	Configure Electrical components for Signal Processing	14 days
3	Verify Sending and Receiving Signal, Calibrate Accordingly	15 days
4	Setup Android Database	7 days
5	Simulate Receiving Data	7 days
6	Configure conversion from velocity to PV	7 days
7	Configure Graph for data we get	7 days
8	Code Kernel Modules for Time Stamping	20 days
9	Code User-Space program for Top-Level Functions	15 days
10	Configure Wireless Access Point	7 days
11	Test and Calibrate Entire System	30 days
12	Construct Housing Solution For Electrical Components	30 days



Questions

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