EE 491 Weekly Report #8 **Date:** 10/28/2013

Group Project: Garmin - Energy Harvesting in Fitness Electronics
Website: http://home.engineering.iastate.edu/~redejmal/senior_design/index.html
Project Number: May14-17
Client: Adam Rasmussen
Advisor: Dr. Degang Chen
Group Members:

Tyler Chenhall – Project Leader & Foot-Pod Team Member
Rebekah Dejmal – Communications & Webmaster & Foot-Pod Team Member
Catherine Homan – Research & HR Monitor Team Member
Allison Sapienza - Research & HR Monitor Team Member
Omer Vejzovic – Research & Foot-Pod Team Member
Jeramie Vens - Research & HR Monitor Team Member

Accomplishments in the Past Week

- Held a meeting with our advisor & client
- Held separate meetings for the thermo & piezo groups
- Submitted the design document rough draft
- Continued researching energy harvesting strategies
  - Focusing on Piezoelectric, Peltier & Seebeck effect
  - Research is being focused on finding energy harvesting parts and ICs that would be useful in a human-wearable device
- Began coming up with designs for the two energy harvesting prototypes
  - The thermo (heart rate monitor group) has selected a DC-DC converter and is beginning a schematic in Multisim. They also selected and ordered a new thermoelectric energy harvesting component, and are investigating thinergy batteries and other components for the design
  - The mechanical (foot pod group) is just beginning the schematic design. An energy management IC has been selected and samples were ordered. Additionally, time has been spent looking for possible alternative piezoelectric elements & the appropriate strategy for connecting to the current board circuitry

Plan for the Upcoming Week

- Work on the research document for Adam
- Continue research on energy harvesting & parts
- Continue developing designs for the two energy harvesting prototypes: piezoelectric/mechanical for the foot pod & thermoelectric for the heart rate monitor

- Meet with Dr. Chen (& Adam Rasmussen via conference call) on Monday

Pending Issues

- none

Individual Contributions

- Tyler
  - Took meeting notes & created the weekly report
  - Researched piezoelectric energy harvesting, with a focus on finding parts for low frequencies and low cost
  - Summarized piezoelectric research, and sent a copy to the client
  - Followed up with the supplier for information on low frequency mechanical energy harvesting
- Rebekah
  - Managed communications with Adam and others
  - Worked on writing the design document
  - Looked at parts for the piezoelectric circuit
- Catherine
  - Researched thermoelectric energy harvesting parts for circuit design
  - Emailed companies for information on thermoelectric generators
  - Helped with the thermoelectric schematic
- Allison
  - Researched DC-DC converters, thinergy batteries, and super capacitors for the thermoelectric circuit design
- Omer
  - Researched piezoelectric energy harvesting & looked for more parts
- Jeramie
  - Performed theoretical estimates on thermoelectric power output for use in the heart rate monitor
  - Began building the heart rate monitor energy harvesting schematic in Multisim
  - Helped select a DC-DC converter and looked for modeling information on the component

Individual Hourly Contributions

- Tyler – 9.1 hours
- Rebekah – 5.4 hours
- Catherine – 5.5 hours
- Allison – 7 hours
- Omer – 6.5 hours
- Jeramie – 11.5 hours