EE 491 Weekly Report #7 **Date:** 10/21/2013

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
- Continued researching possible energy harvesting strategies
  - Focusing on Piezoelectric, Peltier & Seebeck effect, and some solar
  - Increasingly, research is being focused on finding energy harvesting parts and ICs that would be useful in a human-wearable device
- Made substantial progress writing the design document & research document
- Last week, the group made a decision to split into two subgroups for the initial design and prototyping phase of the project. In order to avoid reliance on a single design, three members (Jeramie, Allison, Catherine) will design a thermoelectric energy harvesting prototype for use with the heart rate monitor, while the other three group members (Tyler, Omer, Rebekah) work on a mechanical energy harvesting prototype for the foot pod.

Plan for the Upcoming Week

- Finish the first draft of the design document due this week
- Work on the research document for Adam
- Continue research on energy harvesting & parts
- Begin developing designs for the two energy harvesting prototypes: piezoelectric 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
  - Continued summarizing piezoelectric research, with a focus on evaluating companies with piezoelectric components and finding basic equations for analysis
  - Requested a piezoelectric sample, and also contacted another supplier for additional information on low frequency mechanical energy harvesting
- Rebekah
  - Managed communications with Adam and others
  - Worked on writing the design document
- Catherine
  - Researched thermoelectric energy harvesting in preparation for circuit design in the upcoming weeks
- Allison
  - Researched the Seebeck effect & thermoelectric devices
  - Summarized thermoelectric research completed so far
  - Worked on writing the research and design documents
- Omer
  - Researched piezoelectric energy harvesting & parts
- Jeramie
  - Worked heavily on writing the research and design documents
  - Researched thermoelectric parts and heat sinks
  - Reviewed test data from measurements previously taken on the heart rate monitor

Individual Hourly Contributions

- Tyler – 9.1 hours
- Rebekah – 4 hours
- Catherine – 4 hours
- Allison – 5.5 hours
- Omer – 5.5 hours
- Jeramie – 9 hours