

# EE 491 Weekly Report    DEC15-17    Week 8 (3/9/15-3/22/15)

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**Advisors:** Dr. Ravi Hadimani and Neelam Prahbu      **Client:** Iowa State University  
**Members (roles):** Marion Okoth (Team Leader), Elizabeth Clarkin (Website) and Matthew Mulloy (Weekly Reports)  
**Project Title:** Magnetic Sensor Design.

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## Weekly Summary

The main goals this week were to create the design document, present preliminary COMSOL simulations, and prepare the samples.

## Meeting notes:

### 3/9 Group Meeting

**Duration:** 30 min      **Members Present:** All

- Discussed Design Document

### 3/13 Group Meeting with Advisors

**Duration:** 60 min      **Members Present:** All

## Purpose and Goals:

Discussed COMSOL simulation and permanent magnet solution viability

- Presentation clarification
  - Order of results from simplest to complex
  - Material names
  - Core usefulness in presentation
  - Constant units from input to output
- Increase the dimensions of measureable flux lines
- Additional plots for simulation of current system
- Additional simulation for one magnet on end of core verses one on each end
- Simulations given
  - Current setup
  - Magnet on each end
  - Magnets surrounding core and ends capped
  - Magnets surrounding core and extending for inch on each side
  - Magnets surrounding core and extending for half inch on each side
  - Magnets surrounding core
  - Magnets surrounding core minus half inch on each side
  - Magnets surrounding core intermittently
  - Magnets surrounding half of core

- Magnets surrounding core and air
- Solenoid simulation with and without air
  - Imperfect results
  - Decided to redo
- Possibility of implementing such designs financially
- Design document discussed briefly

## Pending issues

1. GUI (Fast Fourier Transforms, frequency peaks, spectrums)
2. Material creation and Ames Lab Access
3. Continued COMSOL simulation

## Plans for next week

1. Matt: Will simulate with COMSOL based on the group meeting
2. Elizabeth: Will continue working on the website and GUI
3. Marion: Will work with Elizabeth on the GUI
4. All will work on the Project Plan #2

## Individual Contributions (this week)

Matthew Mulloy: Attended the meetings, reading, weekly reports, COMSOL simulation and presentation (9.5 hrs.)

Elizabeth Clarkin: Attended the meetings, FFT research, MATLAB, website (15.5 hrs.)

Marion Okoth: Attended meetings, sample preparation, reading (5 hrs.)

## Total contributions for the project

Matthew Mulloy (64.5 hrs.)

Elizabeth Clarkin (73.5 hrs.)

Marion Okoth (55.5 hrs.)