

*EE/CprE/SE 491 WEEKLY REPORT 3 (10/7/19 – 10/20/19)*

*Group number: sdmay20-27*

*Project title: Gauss Sensor for Magnet Array Filter*

*Client: Dennis O'Neel*

*Advisor: Dr. Mani Mina*

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*Team Members/Role:*

*Muhammad Lutfi Latip -Team Manager*

*Irfan Rafie – Test Engineer*

*Vishal Patel – Meeting Scribe*

*Muhammad Aiman Zulkefli – Research manager*

*Wei-nee Long – Report Manager*

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**o Weekly Summary**

The objective for these that we had for these 2 weeks are as to design a PCB for the hall effect sensors, write the code for data analysis, contact CyRide for potential partnership, get access to Coover Milling Lab, and also set a baseline for data analysis.

We also met with Dr. Brian Steward in Elings Hall and discussed with him the feasibility of using his test bench and other issues that might come with it. We also discussed the possibility of using another test bench that could be a better solution for data collection.

**o Past week accomplishments**

- *Everyone: Discussion on Timeline and Budget*
  - o Discussed with the client on the overall timeline of the project, and overall budget estimation to be used later throughout the 2 semesters

- *Irfan, Vishal, Aiman: Current Gauss and Eddy Current Sensors and their capabilities and limitations*
  - Researched on implementation of gauss and eddy current sensor that is to be used in detecting particle buildups in the filter and the oil engine.
  - Discussed on the capabilities of the sensors in requiring data with having other ambient sources that has effects in the sensitivity of the sensors.
  
- *Lutfi: Research on other sensor technologies that might be worth investigating*
  - Continuous research on other available sensors that can be utilized for this project that can yield better result and more efficient.
  
- *Irfan: Contact Dr. Brian Steward*
  - Contacted Dr. Brian Steward and met him in his office at Elings Hall.
  
- *Lutfi, Vishal: Research on new design to be used that is easier to produce*
  - Discussed the new idea of using Surface-Mounted sensors and attaching them to the Magnet Array Filter.

#### o Pending issues

- *Everyone: Research more how temperature and vibration affect EM properties*
  - Need to conduct test bench and collect data regarding the change in EM on different type of sensors during different conditions.
  
- *Everyone: Research about the Clients patent*
  - Need information regarding the Client's product and how the magnetic field changes when the iron particles accumulate around the filter.

#### o Individual contributions

<b>NAME</b>	<b>INDIVIDUAL CONTRIBUTIONS</b>	<b>HOURS THIS WEEK</b>	<b>HOURS CUMULATIVE</b>
Muhammad Lutfi	Acquired Hall Effect Sensors from TI and Honeywell Contacted Dr. Brian Steward	12	36
Irfan Rafie	Contacted Dr Brian Steward for assistance in using a hydraulic test bench Started developing software for sensors	12	36
Vishal Patel	Researched and updated the design of the sensor.	12	36
Muhammad Aiman	Looked for further improvements that can be added to the design. Looked into Hall Effect Sensor calibration method.	12	36
Wei-nee Long	Research in using temperature sensors to work with Hall Effect sensors.	12	36

### o Plans for the upcoming week

- *Everyone: Complete Required Safety Training for Entering Labs*
  - o Finish safety training to enter Coover Milling Lab
  - o Finish 3 safety trainings that are sent to us by Dr. Brian Steward
  
- *Irfan Rafie: Contact CyRide for partnership*
  - o Email CyRide and ask for a meeting to discuss using Magnet Array Filters on Cyride buses to get benchmark data.
  
- *Wei-nee Long: Research on Eddy Current Sensing Feasibility*
  - o Look into the feasibility of how eddy current can be used to detect brass and aluminum in flowing oil.

- *Vishal Patel: Improve PCB design and print PCB*
  - Update PCB design to accommodate Surface Mount Sensors rather than Through-Hole sensors

○ **Summary of weekly advisor meeting**

- Successfully completed duties for this week, met up with Graduate Student to assist us with printing PCB boards and discuss ordering methods.