

EE/CprE/SE 492 WEEKLY REPORT 3 (2/14/2020 – 2/27/2020)

Group number: sdmay20-27

Project title: Gauss Sensor for Magnet Array Filter

Client: Dennis O'Neel

Advisor: Dr. Mani Mina

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

o Weekly Summary

The team collected and analyzed the data which include baseline values and incremental values of contaminants. These sets of data will help us determine the type of sensor that could be used for our final prototype. In addition, these tests will also help us identify defects and improve our product.

o Past week accomplishments

1) Analysis of data collected

- The team has collected the data that increases with the number of iron particles in the system.
- Overall increment in the sensor reading is observed but the values are partly affected by the fluctuations of the sensor reading.

2) Designing PCB and sensors for surface-mount-method

- The team has decided to use a surface mount method to secure sensors on the collar. This requires the team to use a relatively smaller PCB board that can fit into the space between the magnets.
- This is expected to reduce the fluctuations in the measurements.
- PCB boards and more sensors are designed and ordered from Texas Instrument.

o Pending issues

1) PVC ring cannot hold the sensors firmly in one place:

- Surface-mount-method is proposed
- The team has decided to launch the testing with the sensor directly attached to the collar to first decide on the most suitable sensor to use.
- However, the holding of sensors on the gasket would be an issue in the future once the type of sensors to be used is decided.

2) Determining the best model of sensors to be used:

- Testings are being launched to collect more data

3) Replication of the first experiment

- The team has successfully conducted our first testings on the sensors, and the measurements from the sensor are collected.
- However, to ensure the validity of the experiment, the team has decided to replicate the experiment using a clean filter.
- The same result and the same increment on the measurements of the sensors should be spotted in the second and third experiments

4) Experiment method pertaining the mixing of iron particles

- o The mixer used in the lab is magnetic. Therefore, the iron particles introduced into the system are attracted to the mixer element.

o **Individual contributions**

NAME	INDIVIDUAL CONTRIBUTIONS	HOURS THIS WEEK	HOURS CUMULATIVE
Muhammad Lutfi	<ul style="list-style-type: none"> - Setting up meetings - Collection of data during assigned shifts. - Devising testing plan. - Ordering sensors. 	18	126
Irfan Rafie	<ul style="list-style-type: none"> - Collection of data during assigned shifts - Devising testing plan. - Ordering SOT sensors. 	18	126
Vishal Patel	<ul style="list-style-type: none"> - Improvising the design of the board to make it smaller in order to fit into the collar - Collection of data during assigned shifts 	18	126
Muhammad Aiman	<ul style="list-style-type: none"> - Collection of data during assigned shifts - Devising testing plan. 	18	126
Wei-nee Long	<ul style="list-style-type: none"> - Setting up the test bench - Setting up meetings with advisor and instructor - Writing Biweekly Report 3 	18	126

o Advisor/Client meeting summary

- 1) Discussed about the data that we collected and received feedback about our experiment.
 - a) Testings should be replicated in order to validate the data that we received.
 - b) The upcoming testings should be consistent/same variables.
- 2) Brief the client regarding our progress and present our initial data.
 - a) Seek clients advice regarding the testing process.
 - b) Explained our plan for the coming weeks and what the team hope to achieve.

o Plans for the upcoming week

- 1) Collection of more data from testing
 - The team should determine the max threshold value that the filter could handle.
- 2) Determine the best sensor model to be used for our product
- 3) Identify the best sensor orientation that could give accurate values.
 - The hall effect sensors depend on the amount of magnetic flux that passes through it.
- 4) Replication of the first experiment
 - The team will try to replicate the first experiment to ensure the consistency of the data collected.