

MTRL 466- Sensing Failure Weekly Meeting Minutes

Date: November 6th & November 8th 2019

Room: ORCH 3068

Week 10: Big Picture Overview and Proof of Concept

Leader: Aleisha

Secretary: Sofia

Attendance:

Individual	In Attendance
Catherine Greenwood	Y
Jenna Moledina	Y
Clement Asiedu-Antwi	Y
Isabela Taketa	Y
Aleisha Cerny	Y
Sofia McGurk	Y

Agenda:

1. Familiarization with the Prusa for whole group.

Printed a portion of a small test part so the group could visualize how our final setup might work.

2. Big picture overview- set up for next semester.

- **Type and number of lasers**

Due to the fact that the Prusa is orange we will have to crop the photo (or use green lasers). For proof of concept we are going to use cropping and the red laser. Could also use dim lighting to fix this issue.

Crisscrossed lasers will be too difficult to analyse as we could not discount all edges in a certain direction (vertical or horizontal)- too much extra noise. We will proceed with one laser.

- **Where are we shining the laser on the part?**

MTRL 466- Sensing Failure Weekly Meeting Minutes

When the part is printing, after each layer the print head seems to start from the same position. We were thinking to take a picture of that starting point while the print head is moving back to its initial spot (part should be visible at this point).

- **How many layers are we going to take pictures of?**

Taking pictures every layer will result in too much data to analyse, we were thinking of taking a photo every 5 layers.

- **Placement of the camera and the laser.**

For proof of concept: Have the laser on one side of the printing part and the camera will be placed directly over top of the part.

For next steps we are thinking to put the camera on top of the laser (same side and same angle)- work will need to be done to determine what this geometry looks like.

- **Minimum defect size and what is our defect.**

5x 400 microns (for 5 layers)- Then we know that each subsequent 5 layers should be the same height.

Reconsider parts we can detect errors on- laser must stay on object. Want a flat top.

- **Flow sheet of what our algorithm will be next semester.**

3. Take a new picture with the improved set up (Retort stand and Tripod), and Test out the new image processing (edge detection) on the image we take.

Goal Measure the height of a coin (from the Royal Canadian Mint: 1.58 mm)

Setup:

- 2 retort stands one for the camera (used the measure app to ensure that it was level-directly over top of the coin), and one for the laser at a specific angle.
- Marked a certain height on the retort stand and where the laser fell on the table. Then we moved the laser down and measured the difference between the 2.
- Pictures taken in low light conditions (for improved laser visibility).
- Edges detected using code- shift image one pixel over and measure the difference.
- Confusion over measurements- by hand or computer.

4. Divide up the final report.

Item Suggested (maximum length)

Title Page

Preface (optional) (0.5 pg) Aleisha

Executive Summary (0.5 pg) Aleisha & Jen

MTRL 466- Sensing Failure Weekly Meeting Minutes

Problem Definition (2.0 pg) **Isabela**
Technical Review (2.0 pg) **Sofia**
Project Objectives and Quantitative Goals (0.5 pg) **Isabela**
Design Options (3.0 pg) **Clement** and **Cat**
Detailed Design and Implementation (5.0 pg) **Cat**, **Jen** & **Clement**
Economic and Socio-Economic Assessment of Design (3.0 pg) **Aleisha**
Recommendations (1.0 pg) **Sofia**
Project Work Summary (1.0 pg) **Aleisha & Jen**
References and Appendices (No limit)

5. Printing a “failed object”?

Clement and Sofia to find time to make an overhang failed part.

6. Things we need to figure out next week:

- Go over midterm report
- Software flowchart
- Confirm size of defect
- Confirm type of defect
- Actually measure the coin

7. Questions for Chad:

- a. For this semester are we supposed to have the software measure the height of the object? Or are we able to get the edges clarified and then manually measure the height of the coin or object.
- b. How to go about determining the geometry for having the camera on the same side as the laser (Next semester)?
- c. Should we quantify the minimum defect size for the final presentation?

Action Items:

	Item	Assigned To
1.	Start working on the Final Report	All
2.	Final Presentation Slides	All
3.	Items to figure out	All

Next Meeting Time: Wednesday the 13th from 3-5 pm