Formal Meeting	Week 4
Location	Orchard Commons Room 4016
Date and Time of Meeting	September 25th, 2019, 3:00 – 3:45 PM
Minutes Prepared by	Martin Battilana
Leader	Jacob Koo
Secretary	Martin Battilana

1.0 Attendees

Dr. Chad W. Sinclair
Martin Battilana
Jacob Koo
Hin Yao Chow
Kevin Zhu
Oliver Tian
Devang Lamba

2.0 Meeting Agenda

1) Discuss progress from previous week
2) Go over proposal objective, constraints, free variables
3) Discuss types of sensors to be used for defect detection
4) Discuss various methods of getting useful information from various sensors
5) Go over sections from the Proposal Report
6) Discuss questions and action items from last week
7) Discuss action items for next week

3.0 Notes from Meeting

1) Jacob Koo failed to provide the meeting agenda for the second time after repeated requests
2) Jacob Koo failed to meet communication expectations and failed to provide a status update or goals for the following week
3) Jacob Koo failed to uphold the responsibilities of the Group Leader
4) New Group Leader will be Devang Lamba
5) Discusses stopping the printer to take measurements versus taking measurements while the printer is operating
6) The printer does not move gently and if the camera is attached to the printer, it will shake
7) Start with the simplest possible solution using a single sensor and see how far we can get
8) Need certain thresholds in order to detect where the object is
9) ImageJ software might help identify the images
10) MATLAB is good at manipulating images
11) An image is a set of colour channels and the intensity of a certain part of the image can be used to remove extra information
12) Colour images are separated into red, green, and blue colours (RGB)
13) The images are stored as an x, y position with RGB data but we only need the information that characterizes the inner and outer section of our printed part
14) Maybe this could be done by making the inner part white and the outer part black and represent this data as 0's and 1's
15) A major problem is that defects can appear out of plane (in the z direction)
16) Ultrasonic sensors might not work on small parts
17) Need to be able to detect a certain resolution of the part
18) Should be able to measure defects in x, y and z
19) The camera can be a very expensive sensor and can put us at our price limit

20) Lasers could be used to both identify part boundaries and detect defects in the z-direction
21) A laser can hit the object and bounce back to a detector and if the surface is not flat, the laser will not hit the detector where it should or not at all. This would represent a defect as the top printing surface should be flat.
22) May need to raster laser over surface
23) Constraints could be types of defects you aim to identify
24) A valid approach is to identify specific defects which lead to the most material waste
25) Stringing and oozing defects are not the most critical
26) Overheating and underheating can result in layers not properly bonding together and thermal contraction in the bed can cause warping which builds up layer by layer

4.0 Action Items for Next Week

1) Assign 2 members to get access to 3D printer training and send in the trainee's names to our sponsor
2) Look into how we can utilize ImageJ software
3) Think about resolution in x, y, and z and figure out the precision required to detect defects
4) Create quantitative criteria to compare techniques against
5) Refine objectives and rank them based on how ambitious they are
6) Identify defects which lead to the most material waste
7) Quantify the defects in terms of what needs to be measured
8) Justify every part of a proposed method detection solution
9) Define limits of proposed defect detection technique in terms of what will work for our model size
10) Associate numbers to constraints
11) Begin performing an economic and environmental analysis

5.0 Questions

1) Do we need to stop the printer in order to take the measurements from our sensor?
2) How do we differentiate free space from the printed object?
3) How do we determine where the edge of the part is?
4) How do we detect defects in the z-direction?
5) Can we use a 2-camera approach to acquire a 3D view?
6) How do we detect warping form a top down view?
7) How many points will be needed to measure a surface?
8) When do we need to be able to stop a print and at what level of defect formation?
9) At what point does a defect become a critical defect?
10) Will our solution be applicable to other model 3D printers?
11) What technique will be used for error detection?
12) Where will our sensor be located?

Group Meeting 1	Week 4
Location	Orchard Commons 3rd floor table
Date and Time of Meeting	September 25th, 2019, 2:30 – 3:00 PM
Minutes Prepared by	Martin Battilana
Leader	Martin Battilana
Secretary	Martin Battilana

1.0 Attendees

Martin Battilana
Devang Lamba

Kevin Zhu Oliver Tian Hin Yao Chow
2.0 Meeting Agenda
1) Discuss results from the Proposal Report 2) Discuss report standards/guides for proposal report 3) Discuss professionalism 4) Discuss responsibilities of the Leader Role 5) Discuss formal meeting minutes and agenda – Jacob Koo failed to provide this after repeated requests 6) Prepare for formal meeting
3.0 Notes from Meeting
1) Created questions about the proposal report to be brought up in the Formal Meeting 2) Clarified the budget 3) Members updated the Weekly Tracking Guide 4) Discussed defect detection using visual and thermal methods 5) Reviewed Gantt Chart to discuss the next steps 6) Reply to Chad's email and send him the draft for the proposal report, the updated meeting minutes from last week and send our Gantt chart

Group Meeting 2	Week 4
Location	Orchard Commons 3rd floor table
Date and Time of Meeting	September 25th, 2019, 3:45 – 4:15 PM
Minutes Prepared by	Martin Battilana
Leader	Martin Battilana
Secretary	Martin Battilana
1.0 Attendees	
Martin Battilana Devang Lamba Kevin Zhu Oliver Tian Hin Yao Chow Jacob Koo	
2.0 Meeting Agenda	
1) Discusses our previous inability to meet the client's expectations 2) Correct our lack of communication and expectations 3) Discuss and assign tasks for action items and questions for next week 4) Discuss the formal meeting	
3.0 Notes from Meeting	
1) Discussed sending our sponsor an update of our Weekly Tracking Guide each week 2) Divided up action items and tasks for next week to distribute the workload 3) Decided members who would receive 3D Printer training (Martin Battilana and Devang Lamba) 4) Hold another private meeting on Monday September 30th from 12:00 to 1:00 pm to discuss the project progression from last week.	