

Formal Meeting	Week 8
Location	Frank Forward Room 308A
Date and Time of Meeting	October 23rd, 2019, 3:00 – 4:00 PM
Minutes Prepared by	Martin Battilana
Leader	Devang Lamba
Secretary	Martin Battilana and Hin Yao Chow
1.0 Attendees	
Dr. Chad W. Sinclair Martin Battilana Hin Yao Chow Oliver Tian Devang Lamba Kevin Zhu	
2.0 Meeting Agenda	
<ol style="list-style-type: none"> 1) Provide a status update regarding the completion of action items and questions posed in last weeks formal meeting 2) Discuss potential questions and improvements based on our Midterm Report 3) Show our socio-economic analysis and receive feedback so it can be improved 4) Present a clear plan of action including camera setup, why it is going to work, what we are going to collect, and a justification of the hypothesis from both hardware and software sides 5) Discuss using error detection using layer height multiples versus shape error 6) Discuss goals for next week 	
3.0 Notes from Meeting	
<ol style="list-style-type: none"> 1) Jacob Koo did not attend this formal meeting (he called in sick last minute) 2) The social analysis was not presented as Jacob Koo was not there 3) For wasted filament, we can bound the values between 0 and 37% where 37% is the average amount wasted by FDM printers. If we can reduce this from 37%, then this is good 4) Company can include a 50% to 75% markup of price, can scale price with the cap being the cost of the printer (\$850) 5) Life of an FDM printer is a variable in economic and social analysis 6) If the idea is a failure, make it convincing that there is no way to make money on that idea 7) MATLAB was never built for speed, try to speed up our computation time 8) Make sure with background subtraction that there isn't additional noise 9) Printer is set up in undergraduate lab room 218 10) Side mounting the camera is simpler than mounting the camera on the nozzle or top of printer 11) If we go to the machine shop and ask for something to be machined, it will not be exact, there will be a minimum resolution to the technique, and a tolerance that has to be specified 12) FDM printers have its own tolerances 13) 5% shape error is not working, throw this method away 14) Defect should be a function of layer height, needs to be optimized between 1 to 3 layer heights 15) Thermal expansion can be accounted for in software algorithms 	
4.0 Action Items for Next Week	
<ol style="list-style-type: none"> 1) Perform various analyses based on the min-max scenarios 2) Software team can attempt to apply their solution to different lighting conditions 3) Speed up error detection time 	

- 4) Try to do an image comparison with a simple object with a simple background
- 5) Try image detection with an actual print
- 6) Show that our software method is able to detect a defect
- 7) Start on side view imaging and make sure to take the simplest path as a starting point
- 8) Optimize layer height between 1 to 3 multiples of the layer height
- 9) Need to go through several prints and determine what a failed print is
- 10) Choose 1 part where we can generate reliable defects
- 11) Stop a part right when a defect has occurred so that the software team can confirm this defect with the software
- 12) Have a concrete demonstration for how to segment photos
- 13) Perform a sensitivity analysis on all variable for both socio-economic analysis
- 14) Include the risk of stopping prints in the economic analysis

5.0 Questions

- 1) Which parameter has the biggest impact on the economic viability of our solution?
- 2) What is the life of an FDM printer?
- 3) What is the typical waste for FDM printers?
- 4) Do we need to supply specific lighting for our vision sensor?
- 5) Is doing an average subtraction better than subtracting pixel by pixel?
- 6) Can we detect stringing and oozing with our software?
- 7) What are the impact of different lighting conditions?
- 8) Can we get around the lighting problem with our software?
- 9) Can we binarize our image?
- 10) What defect will be the easiest to detect?
- 11) How can we quickly optimize our defect detection software?

Group Meeting 1	Week 8
Location	Frank Forward Computer Lab
Date and Time of Meeting	October 23th, 2019, 2:00 – 3:00 PM
Minutes Prepared by	Martin Battilana
Leader	Martin Battilana
Secretary	Martin Battilana
1.0 Attendees	
Martin Battilana Kevin Zhu Hin Yao Chow Oliver Tian Devang Lamba	
2.0 Meeting Agenda	
<ol style="list-style-type: none"> 1) Discuss Progress from Mechanical, Software and Socio-Economic Teams 2) Prepare for Formal Meeting 3) Discuss action items and questions based on last weeks Meeting Minutes 4) Discuss any problems or blockers that arose during the week 	
3.0 Notes from Meeting	
<ol style="list-style-type: none"> 1) Discussed the definition of what we consider a critical defect 2) Discussed mechanical setup of printer, and possible orientations of the camera 	

- 3) Discussed a software method to detect and isolate the 3D printed object from the background
- 4) Prepared for the Formal Meeting
- 5) Made a few changes to the PowerPoint Slides for the Formal Meeting
- 6) Went over questions and action items based on last week's Meeting Minutes
- 7) Discussed potential problems with our current proposed solution.