Group Meeting	Week 5
Location	Frank Forward Computer Lab
Date and Time of Meeting	September 30th, 2019, 12:00 – 1:00 PM
Minutes Prepared by	Martin Battilana
Leader	Hin Yao Chow
Secretary	Martin Battilana

1.0 Attendees

Martin Battilana
Jacob Koo
Hin Yao Chow
Oliver Tian
Devang Lamba

2.0 Meeting Agenda

1) Discuss the use of 3D sensors
2) Discuss software to convert camera data and get quantitative values in order to detect defects
3) Discuss how to turn an image into computer data to detect defects (ImageJ and Open CV)
4) Discuss speckle data for enhanced resolution
5) Discuss an x-y plane laser scanner and refraction laser sensors in terms of quantitative results
6) Go over action items and questions from Week 4 Formal Meeting Minutes
7) Discuss next steps in order to continue project progression
8) Distribute tasks for work to be done this week
9) Discuss status update for Formal Meeting

3.0 Notes from Meeting

1) ImageJ may not be the correct solution to use, lots of problems with it
2) MATLAB might be able to do real time imaging without addons
3) 3D scanning uses lasers to scan a part and produces an STL file.
4) Qlone is a 3D scanning application for your phone
5) For a live monitoring system, 3D scanning is slow
6) Ciclop 3D scanners use 2 cameras to get 2 images
7) When using MATLAB to convert an image to binary, it can be very challenging to determine where the boundaries of the printed part is versus where free space is
8) Need to first isolate the image, then get RBG profile
9) MATLAB has a 2D image pixel coordinate system which stores the values in a matrix
10) RGB profile could be overlaid onto the image and the 3D model could be segregated from the background
11) To reduce error, there could be a routine to check between 2 different images
12) For speckle pattern, sensors project an illuminous laser light as well as a reference laser light to acquire a face map of the amplitudes on the surface. It can then be processes through software such as MATLAB to get a 3D displacement matrix. Stress and strain could also be detected.
13) Potentially use CCD resolution cameras (risk that cost may be too high)
14) The plan is to move along with image photo comparison using MATLAB to develop a routine
15) Defects that we will focus on include: “spaghetti monster”, warping, and layer shifting
16) Sensor should be able to measure live feedback in the x-y plane at a specified z
17) For the formal meeting, start by discussing process that wont work and then discuss parts that worked well

18) Our camera sensors should not stop the printer from printing
19) The goal is to create a set up to take 3D images from side views
20) The limit of MATLAB is 524288 elements

4.0 Action Items for Next Week

1) Look more into MATLAB code
2) Look into slicer settings
3) Figure out a routine that can detect defects within 3 to 4 minutes
4) Create a short list of cameras as potential solutions for sensors
5) Look into real time image uploading
6) Hin Yao Chow and Devang Lamba will look into image detection (live image uploading system), types of cameras/camera systems and will look at exploring cctv systems
7) Martin Battilana will look into how to get measurement data from an optical sensor and what this data looks like (matrix of RGB and x, y positions)
8) Jacob Koo will be looking at how to isolate the print from the background in an image as well as how to obtain reference points.
9) Kevin and Oliver will work on how to create an error routine assuming the sensor data is imported as a matrix

5.0 Questions

1) How do we compare the x-y distance at each layer for 3D sensors?
2) How do we create an image capturing and uploading routine?
3) How do we obtain a matrix of useful information from the sensor and what will this matrix include?
4) Car reverse camera has lines overlaid on it, could this be applicable to our solution?
5) From our uploaded image, how can we measure distance for each height and convert it into a matrix?