

FAMU/FSU College of Engineering
Department of Electrical and Computer Engineering
Customer Needs

Team #310

**Camera Integration for In-Situ Process Monitoring in 3D
Printed Parts**

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Customer Needs:

Generate in real time a 360 scan of 3-D printed objects using cameras.

Overview:

- Project Description

The goal is to generate, in real time, an accurate 360 image of 3D printed parts using cameras(e.g. depth, tracking cameras, etc). Other generation techniques and tools, such as lidar and 3D scanner should also be investigated for possible use.

- Key goals

Generate accurate 360 images of 3D printed parts.

Construct an arm to take a camera around a 3-D printed object.

Develop and improve techniques to boost the software

Questions:

1. Is there specific hardware that needs to be used?
2. Can any image processing software be used?
3. Why do they need a 360 scan of objects?
4. Will produce the necessary support needed to complete the project?
5. Success criteria?

Customer Statements:

1. Iphone 13 Camera(s), Markerbot 3D printer, AutoCad
2. As long as the file is exported as a STL file that is fine but AutoCad will be used to generate and deliver the final project
3. Build a turntable to rotate a 3-D printed object
4. Determine techniques to improve the imaging process

Explanation of the Results:

The customer statements were gathered by contacting Dan Ewing(Project Sponsor), Samantha LaFrance (Project Overseer), and Fasih Waheed (Technical Consultant) who are both graduate students who have made previous developments on this project.

In addition to their results and findings provided we are tasked to collect data for maximum image processing.

The group asked the questions above and in response we determined the customers needs and wants.

Needs/Requirements:

- Be produced in AutoCad
- Use Iphone 13 camera
- Turntable implementing a stepper motor
- Result saved in STL files
- Provide data to produce optimal image processing

Interpreted needs:

- Use a 360 image processing software/app that uses the Iphone 13 camera to create a STL file of the object that will be produced
- Use the STL file in AutoCad to generate a 360 image that will be 3-D printed at optimal standards
- Develop a Turntable with a stepper motor to hold the camera while producing the 360 scan

Design Alternatives:

- DesignWork
- Intel Cameras
- Lidar Camera/Extension
- Arm moving a camera around a 3-D printed object

Codes and Standards:

The Decision Making process:

- Define the problem and understand it. Discuss among the group.
- Brainstorms possible solutions. Discuss amongst the group most plausible.
- Gather necessary data required for implementing a tentative solution. Re-evaluate Tentative Solution for plausibility and effectiveness.

- Design the Tentative Solution product and construct it. Re-evaluate for plausibility and effectiveness.
- Test design for Tentative Solution and gather data. Re-evaluate for plausibility and effectiveness.
- Evaluate the testing phase and determine its level of success. Decide if design can be improved and if time/budget allows for it.