6.S078 Update

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1 Plan Progress

This week has been focused on prototype progress, as weeks will most likely be for the rest of the class. In our meeting with Dr. Fantone (an optics consultant who has done consumer, medical, and military optical metrology work), e clarified our understanding of how our implementation concepts would work, and gained knowledge of some techniques that should prove to be very helpful. Dr. Fantone also expressed that he thought our accuracy goals (0.1 mm) are very conservative, even 'sloppy', which gives additional hope that our low price point is achievable.

We also noticed a few potential competitors emerge in the market. At SXSW MakerBot announced the Digitizer, a desktop 3D scanner they are developing. It is still in prototype phase, so there isn't any information available on price and accuracy. Based on the price of MakerBot's 3D printers and their description of the technology they were using, we expect the Digitizer will come in at a higher price point than we are aiming for, but time will tell. Additionally, an Kickstarter campaign for a company called CADScan is very near its £80,000 funding goal with 6 days left; we expect it will get funded. CADScan is also producing a desktop 3D scanner. Based off the Kickstarter campaign they are planning on a price at least over $1,000. There wasn't explicit information on accuracy. These competitors show that we aren't completely crazy in thinking there could be a large market here, but it does mean that we are going to have to be more aware of the competitive landscape.

We also discussed what the team's plans for continuation of the project after the class. We have two members that are planning to continue working on it over the summer, and will be applying to various accelerators for that. We also discussed what commitments could be after that point, and came to some conclusions. Obviously, these conclusions would be flexible enough to adapt to changing circumstances.

2 Prototype Progress

We've started software development in earnest. We've designed our system so we can start coding for use with USB Webcams and external display projectors, and will be able to (relatively) easily transition the code to our final system. If you want to be able to look at our software development progress, please email us (dcba@mit.edu) and we can add you to our private GitHub repository.

We ordered initial parts for hardware prototyping as well. We've laid out a reasonable development plan that has us going end-to-end on our test hardware, from imaging to 3D model, by the 8th of March.

Our meeting with Dr. Fantone really helped us elucidate the plan for projecting light on the object. We came to him with the projection options we had previously brainstormed, and of those only having a grating in front of an LED really survived. The name for the grating projection technique we would use is Talbot imaging. The other concepts we decided to look into after this meeting are creating patterns interferometrically (i.e. optical fringes) and Moire contouring.

3 Baffling Variables

None are particularly baffling at the moment. The biggest unknown for us is execution.

4 Seven Day Plan

This is less of a seven day plan as much as a near future development plan:

The software plan has us generating a triangulated point cloud by Saturday 3/16, and using existing graphical software to mesh that into a surface by next Tuesday, 3/19. We then have the meshing process automated (using the libraries for the existing software) by next Friday, 3/22.

Over the next week, hardware has two separate tasks. First, it is integrating the sensors and chips we ordered into a microcontroller which will be able to talk with the software program. Second, it needs to

decide on what we need to test in order to decide between our different projection options. It also need to start ordering the parts necessary for these tests.

5 People to Meet

We are doing fine on this front.

6 Desired Resources

Also doing OK. We're still working on getting prototyping funding, and am picking up that conversation with Professor Gifford again on 3/17.