6.S078 Update

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1 Plan Progress

After meeting with Professor Gifford last week, we were left with 3D scanning and LIDAR as our two potential products. We decided to pursue 3D scanning, thinking that there are larger potential markets for 3D scanning, and that the core technology can be applied to different market segments. The next week will be a combination of research into existing 3D scanning technologies, early prototype sketches, and research into potential 3D scanning markets.

Prior to this week's research, our guess is that low-cost 3D scanner aimed at consumers, riding alongside the current excitement in consumer 3D printing, could be great market. The target customer for that would be a digital fabrication hobbyist/enthusiast/early-adopter, or even a small-scale manufacturer (machine shops). Our design focus for this market would be to bring resolution to smaller than typical machining tolerances (0.1 mm) while keeping the unit affordable (below $500). However, we are excited to see what other, potentially more ambitious, applications of the technology come up in this week's research.

This week's plan is to refine our market analysis by looking into a number of particular potential applications of 3D scanning, as well as to research existing 3D scanning methods. By the end of this week (+2/22) we would like to have selected a few preliminary design schemes so that we can start prototyping.

Potential markets for further research this week:

- Hobbyist and small manufacturing/prototyping
- Hobbyist art and 3D scanning for the sale of artwork on sites such as Etsy
- Restoration and documentation of 3D artwork, primarily sculptures
- Cheap, regular, full-body scanning for medical applications - scoliosis, dermetology, etc.
- Interior design and architecture - cheap full-interior scans of rooms (see matterport)

Possible technologies:

- Stereo cameras
- Camera array
- Stereo or single camera paired with laser triangulation
- Laser triangulation
- Structured light
- Laser time-of-flight
- Variable focal distance scanning

2 Prototype Progress

As we have yet to select what approach we are taking to 3D scanning, we have not started building prototype software or hardware. We plan to start making progress on a prototype by the end of this week.

3 Baffling Variables

This week will reveal more potential difficulties for the idea. The above goals for this week - researching technologies and markets - may be the two components of this project that could be best described as baffling at the moment.

4 Seven Day Plan

- **Team goals**
  - Each team member will research 3 existing 3D printing technologies - estimated difficulty, expense per unit, and time to prototype for each
- **Troy**
  - Contact 6.838 (Advanced topics in computer graphics: Computational Fabrication) professor and run through their 3D scanning assignment with Turner
  - Obtain funding for prototyping
- **Craig**
  - Contact ex-employer (AutoDesk) to research what is required for 3D scanning in consumer/industrial CAD.
- **Gus**
  - contact MITERS, the hobby shop, Artisans Asylum, BOLT, LEMNOS labs, and Tech Shop to research the hobbyist space
  - Contact early purchasers of 3D printers (possibly through MakerBot or open-source 3D printing forums) to gauge hobbyist interest/requirements/use cases for a 3D scanner
- **Turner**
  - Work through 6.838 3D scanning assignment with Troy
  - Contact friend working with Form Labs and venture capitalist friends to better understand the applications of 3D scanning they see, and so inform our own market decision

5 People to Meet

We haven't identified any particular people we would like to meet at this stage (other than the professor for 6.838 listed above...we'll let you know if we have difficulty getting through to him). We would like to have discussions with a number of market experts, such as 3D printing, art, hobbyist hardware, medical, or architectural technology experts, the possible applications within each market and potential market value. One way to approach this would be to talk with venture capitalists in these areas, who every day see multiple new technologies and so may be able to give us valuable feedback.

6 Desired Resources

In order to start prototyping we need some capital to purchase components. We have access to all of the facilities that we will need, but at present we lack the funding to purchase materials. In our meeting with Professor Gifford he mentioned that it would be possible to get some form of funding, such as a forgivable loan, from the course's VC partners. We would like to pursue that possibility.