3D Scanner

FPR

Team 8

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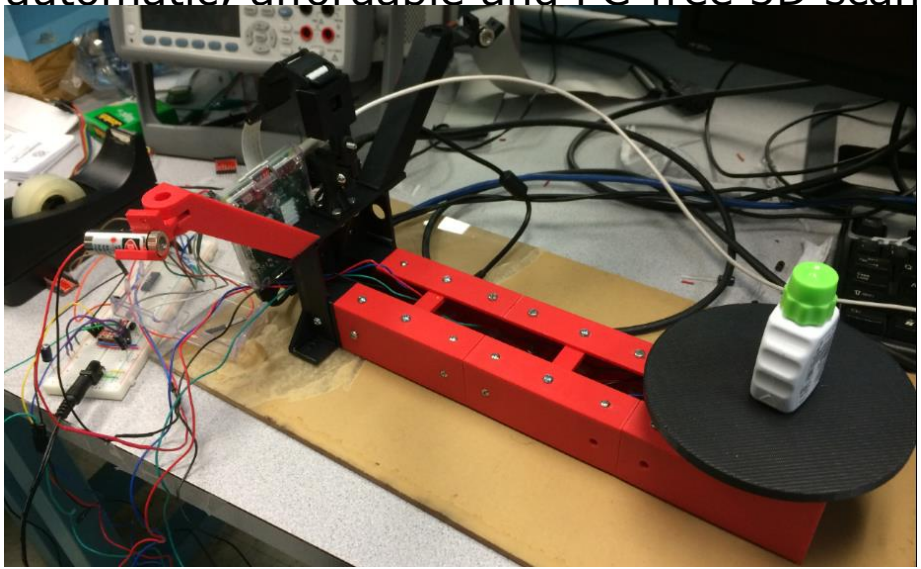
Advisor: Professor Tessier

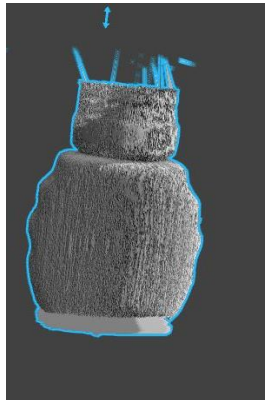
Project Overview

What's our motivation ?

- to build a fully automatic, affordable and PC-free 3D scanner

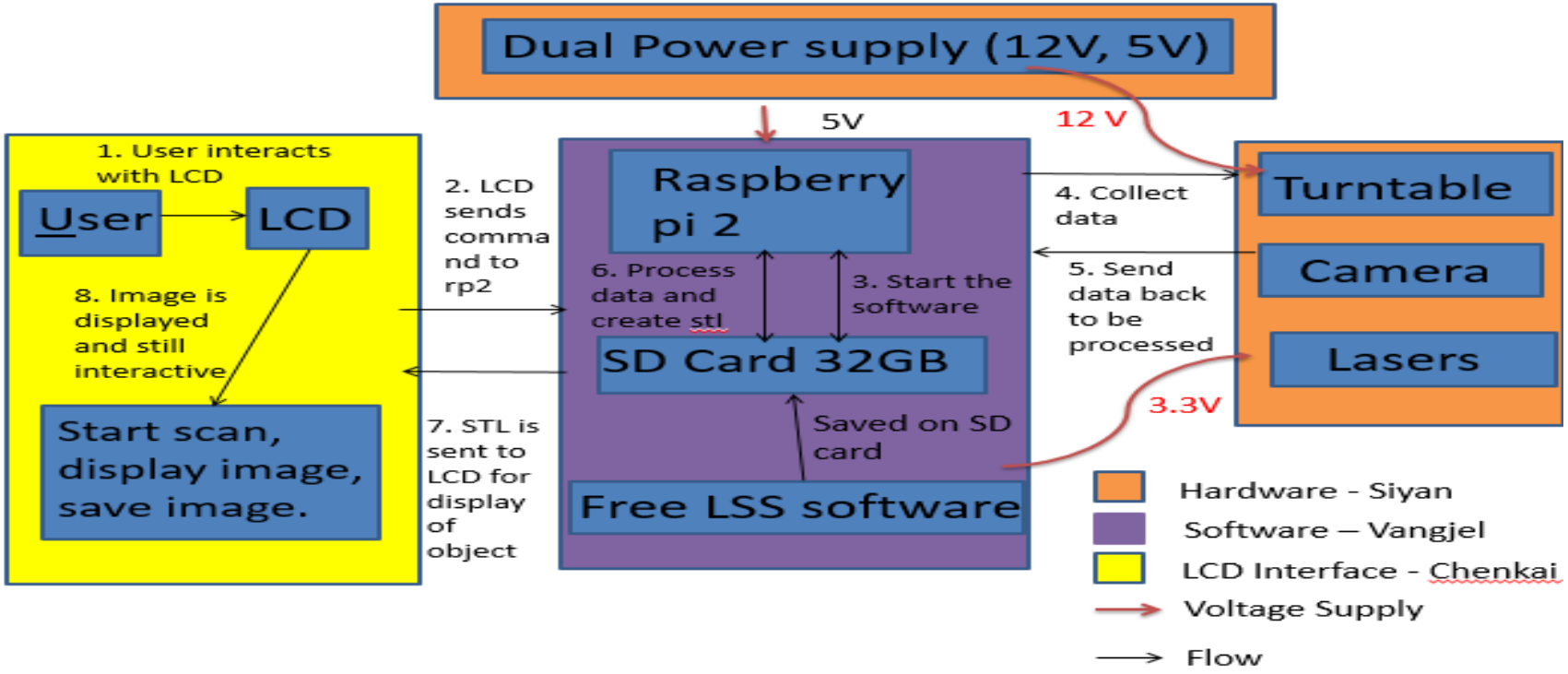
Input: physical object





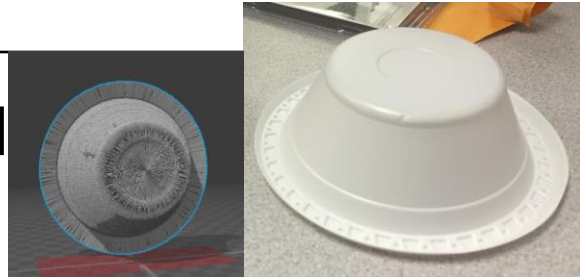
Output: STL file

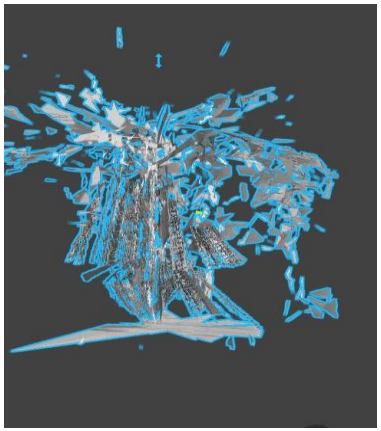
Block Diagram



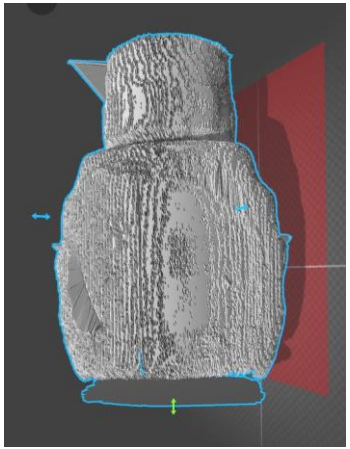
Proposed FPR Deliverables

A printed out object of sample scanned objects.





MDR



CRD

FPR

Some Changes

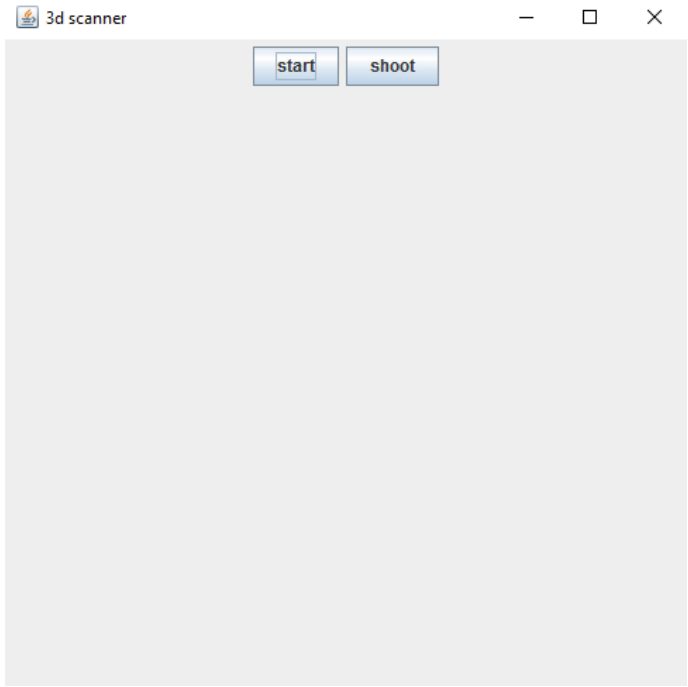
- Stronger lasers
- Created soldering board instead of breadboard
- Added the LCD Screen

Changes we promised for FPR

- We will implement a virtual keyboard for the LCD screen so that users can enter in the destination of the email containing the stl file.
- We will have printed out objects of sample scanned objects.

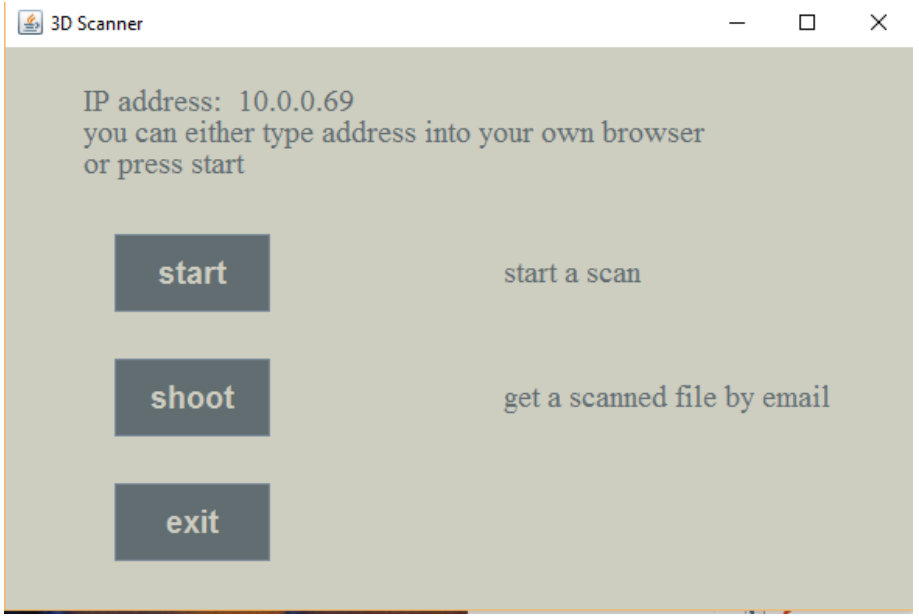
Interface

- GUI from CDR
- File filter
- Fully automatic



Interface

- Bigger button size
- Brief description

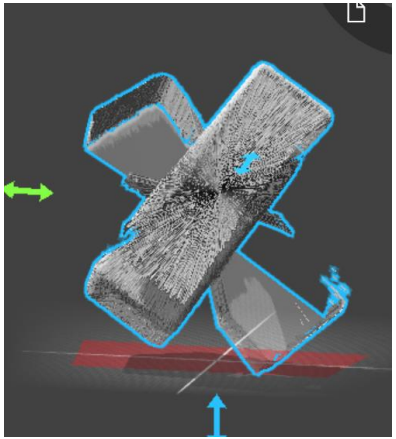


Virtual Keyboard

- Service starts on startup
- So does the keyboard

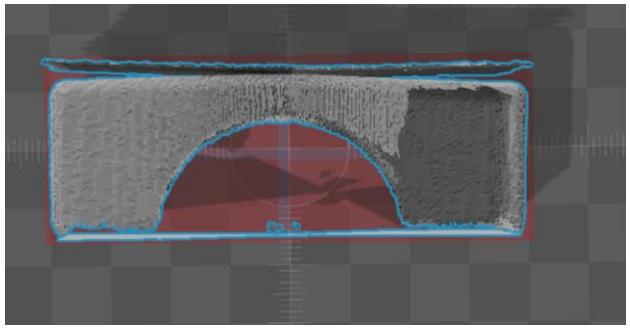
Optics Sensor

- One vs. Two lasers
  - Able choose one or two lasers for a scan
  - not increases the quality
  - but reduce the number of “gaps”
  - calibrate before use

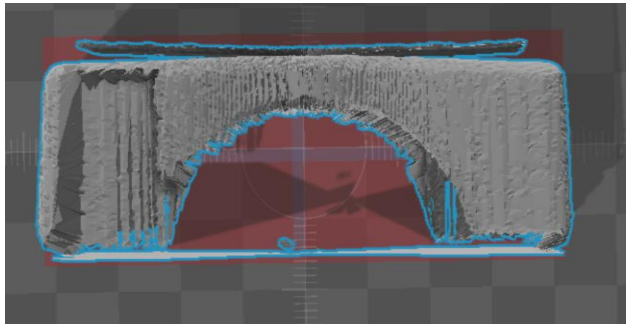


Difference in some shapes 1vs2 lasers

- 1 laser:



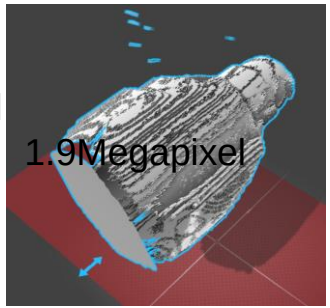
- 2 lasers



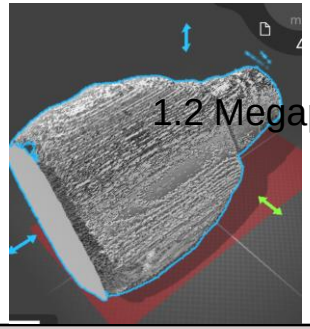
Resolution

- Resolution:
  - 5 Megapixel(2592 X 1944) takes about 55 mins.
  - 1.9Megapixel(1600 X 1200) takes about 10 mins.
  - 1.2Megapixel (1280 X 960) takes about 8 mins.
  - 0.3 Megapixel (640x480) takes about 3 mins.
- Size : 2MB- 100MB

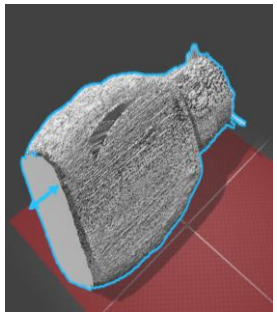
0.3 Megapixel



1.9Megapixel



1.2 Megapixel



Final Project Results

- The scanner is accurate to millimeters, if there is even any discrepancy at all.
- Material of the object and lighting can affect the scans.

Final Price

Raspberry Pi 2
(~$45)
Step-Motor(A4988) (~$10)
Laser Sensors (~$25*2=50)
Camera
(~$30)
SD Card
(~$10)
Power Supply
(~$10)
Capacitive Touch Screen LCD (~$70)
Total: