ELEC3300 Project
3D Scanner

Group 24
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Sensors and actuators -- STM32F405RG

Input

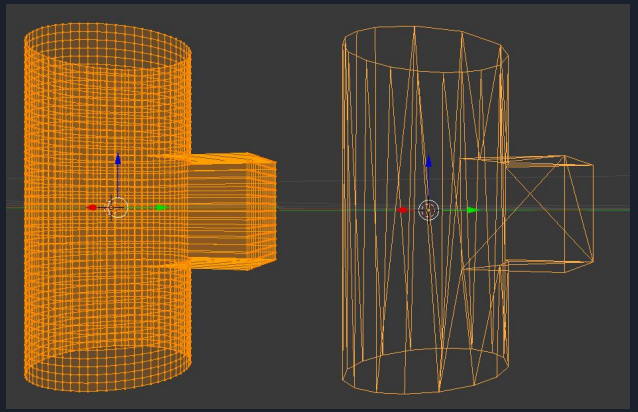
- Laser sensor
  - Distance to the object
  - ADC
- Buttons
  - Control Start, End

Output

- Steppers
  - Rotation of the platform, Height of sensor
  - Controlled by ready-made module
- USB flash drive
  - Storing data
- Screen

User interface and control

- Coordinates collected is written to 3D model file
- VNC1L USB Controller
  - UART communication
  - Write onto USB thumb drive realtime
- Binary STL file format
  - A list of triangular faces
  - (Very long) array of coordinates
- Vertex simplification
  - Blender *(see figure)*
- GUI
  - Screen to display user menu
  - Buttons control



Applications

- 3D Documentation
- Model reconstruction
  - Building 3D models can be time consuming
  - Save time and effort
- Prototyping
- Object duplication with 3D printers

A simpler Arduino 3D scanner project found on Youtube.

The actual operation of our scanner will be in some ways similar to what is shown in the video.

Limitations

- Minimum distance from laser sensor to object
- Scanning duration
  - May work on improving speed after prototype is working
  - Can use multiple laser sensors
- No color
- Convex shapes only
  - Multiple laser sensors at different angles
  - Camera / image processing algorithms