

3D Scanner

Mechanical Engineering

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Abstract

The objective of this project was to design and build a portable and versatile three-dimensional scanner rig. This rig is capable of accommodating a variety of 3D scanners, though it has been designed around the Xbox Kinect sensor, and operates by revolving around an object of up to 1 ft in diameter and 2 ft in height. The rotating portion of the rig is attached to a stand with adjustable height that can change the axis of rotation from vertical to horizontal. The entire rig weighs 30 lbs and is foldable to a volume of approximately 2'6"x1'X1' for easy transportation and storage.

Main Parts

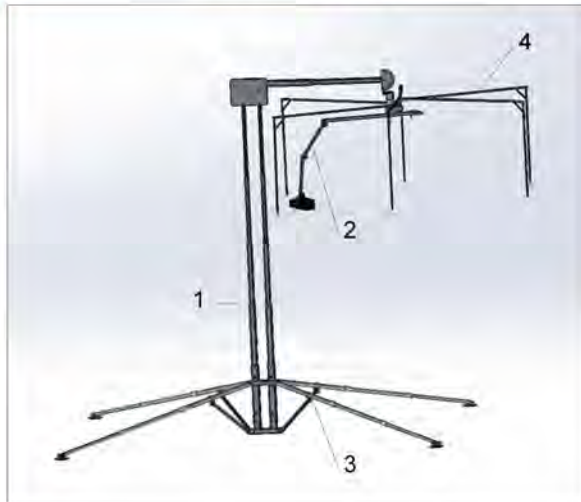
The prototype consists of 4 main subsystems:

- 1) Base:** Consists of double tubing vertical telescope tubes and horizontal telescoping tubes. Used to adjust the height depending on the necessity of scanning.
- 2) Motor and Camera Arm:** Used to hold and rotate the camera 360 degrees around the object to be scanned.
- 3) Foldable Legs:** To provide stability with respect to the weight and the position change of center of gravity with in the system.
- 4) Protective shielding:** Used to avoid interference from third party when the camera is in motion.

Capabilities

- Capable of scanning a exterior of a human body with many added new features not seem among other 3D scanners.
- Can be folded to a small volume for storage.
- Can withstand a deflection up to 20 degrees without tipping.
- The axis of rotation of the camera can be changed.
- The height of Scanning can be changed upon the necessity.

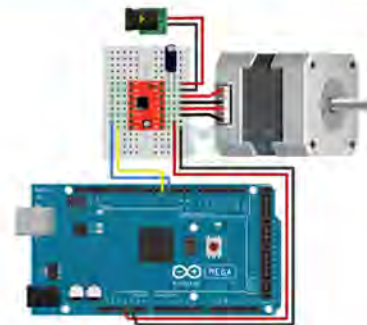
SolidWorks Design



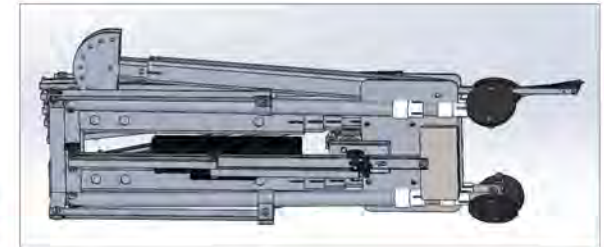
Specifications

- Expanded Clearance:** 6'5"
- Folded Dimensions:** 2'6"x1'x1'
- Weight:** 30 lbs
- Angular Scanning Resolution:** 0.06 degrees

Motor Circuit Diagram



SolidWorks Folded View



Sponsors

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