3D Scanner System Using Python

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Outline

- Motivation
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- System setup
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Motivation

- We live in a 3D world
- We see 2D images but perceive the world in 3D
- Intelligent robot should have this 3D reconstruction capability

Objective

- To Construct 3D object from the sequence of 2D images at different rotations.
- To analyse mismatch between real 3D world and re-constructed world.

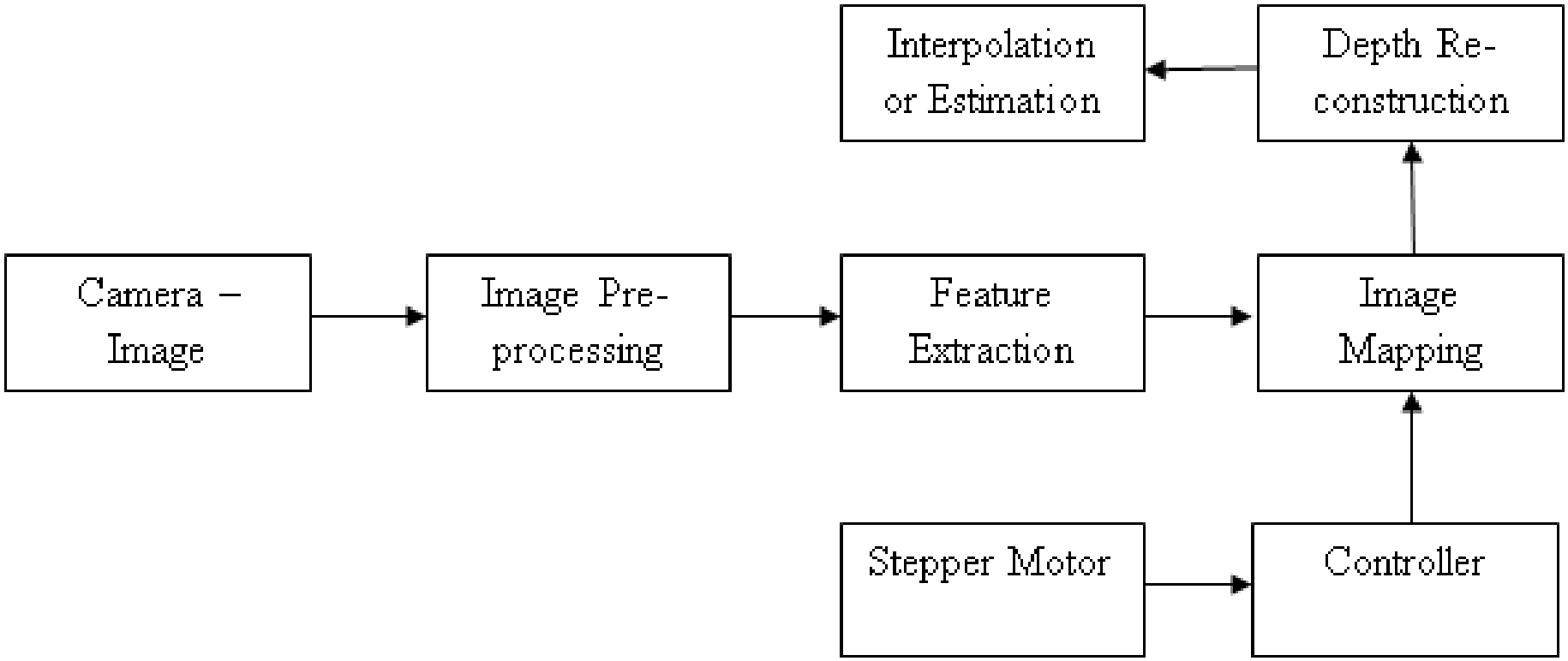
Software and Libraries

- Operating System
  - Ubuntu
- Language used
  - Python 2.7.6
- Libraries
  - Open CV
  - Numpy
  - matplotlib
  - Tkinter

System setup

- Rotating platform
- Camera
- Controller
  - Arduino
- Background with proper light

Methodology



Results

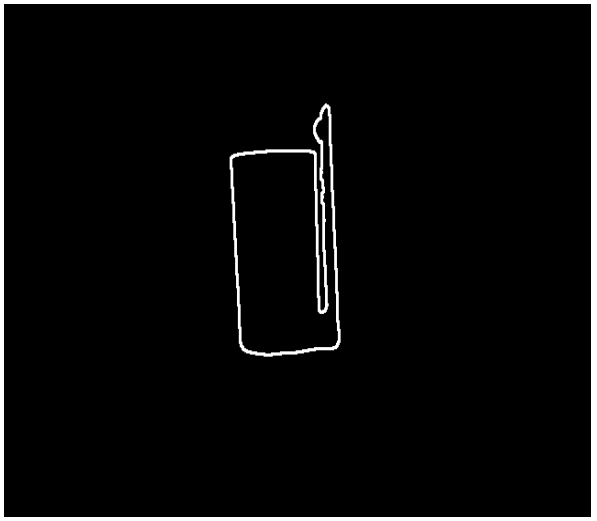


Fig. Actual RGB image for pen cap and edge detection for the same

Results

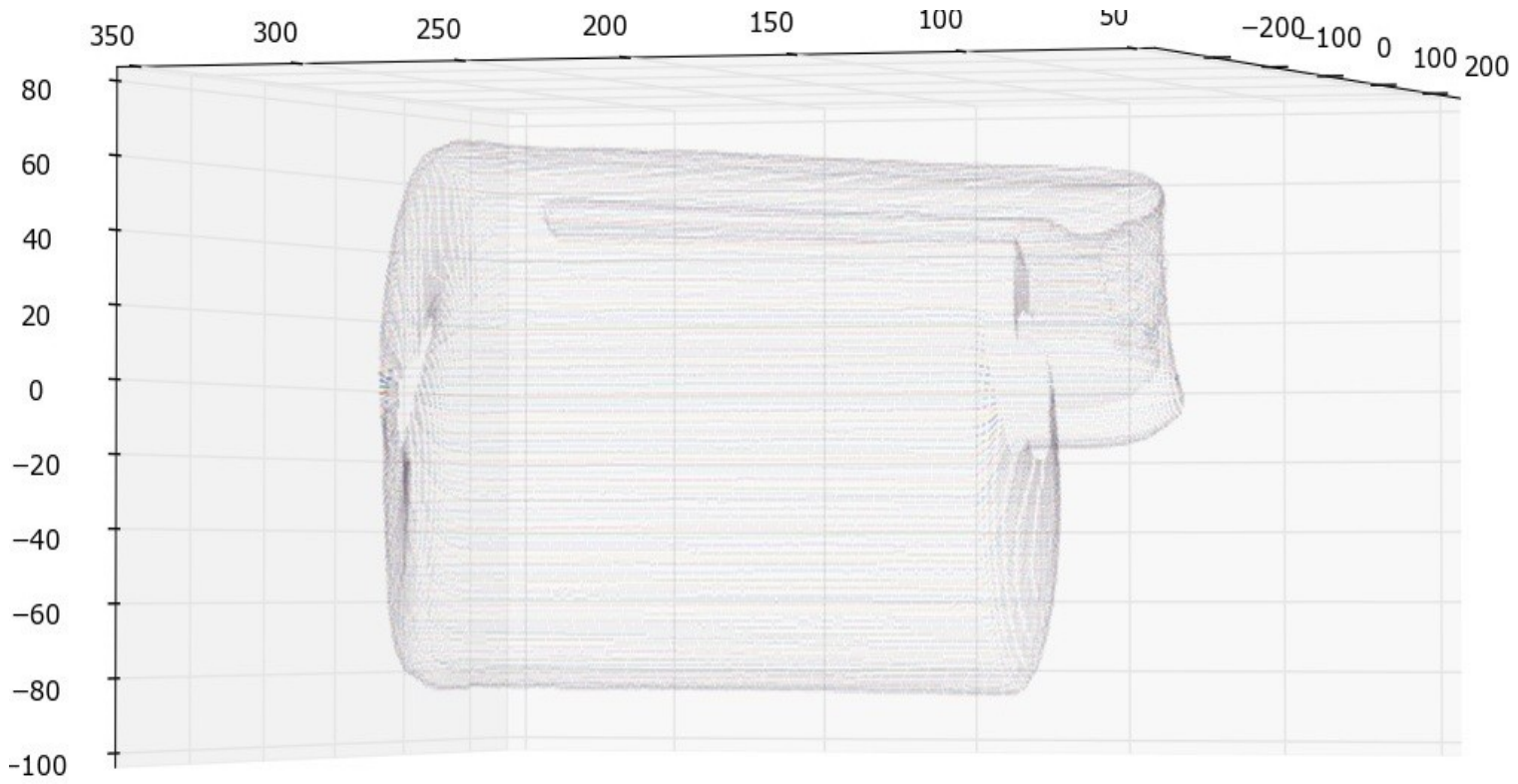


Fig. Plotting 3 coordinates in a 3D space for pen cap as an input

Application

- Machine intelligence
- 3D printing
- Industrial design measurements
- Quality inspection

Further work

- Establish a method of calculating mismatch between real world and re-constructed world.
- Establish a few bench mark problems.
- Refine the method for minimizing error.

THANK YOU..!!