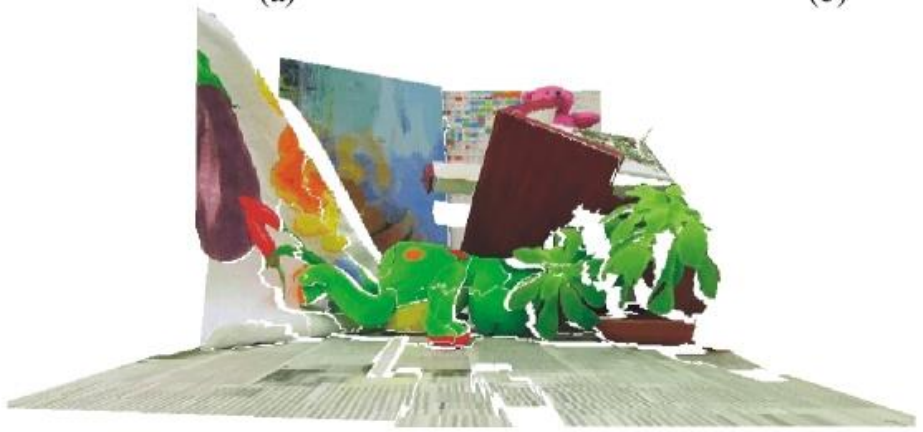
3D scene reconstruction with a Kinect-stereo system

COMPUTER VISION

CARLOS ARANGO DUQUE

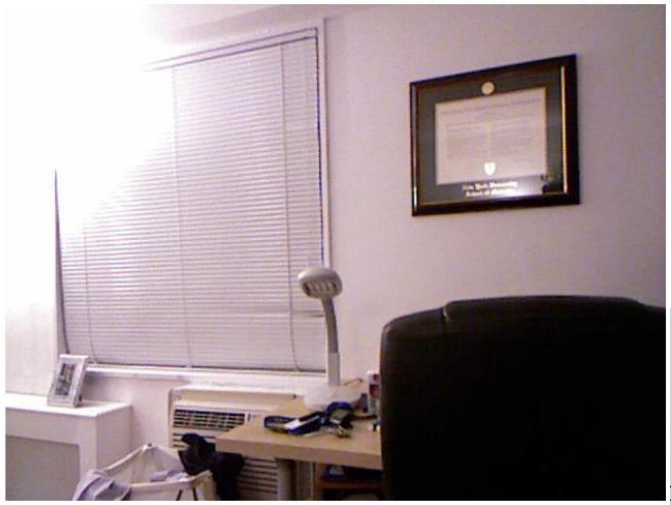
Stereo Reconstruction

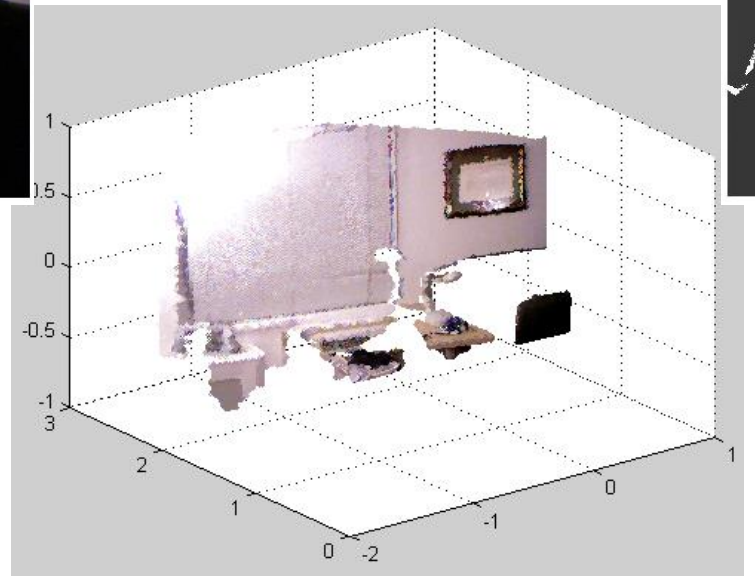
(a) (b)

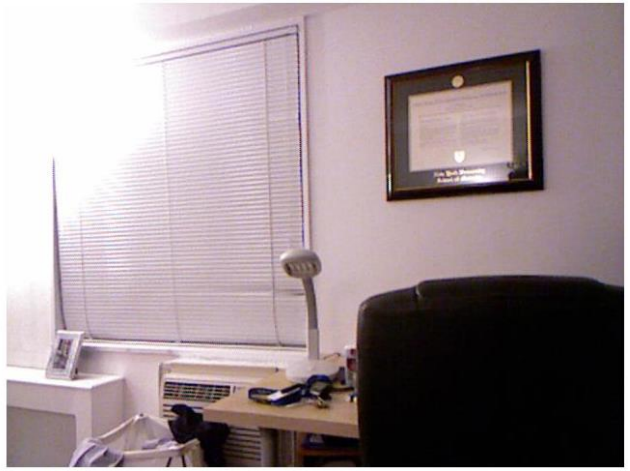


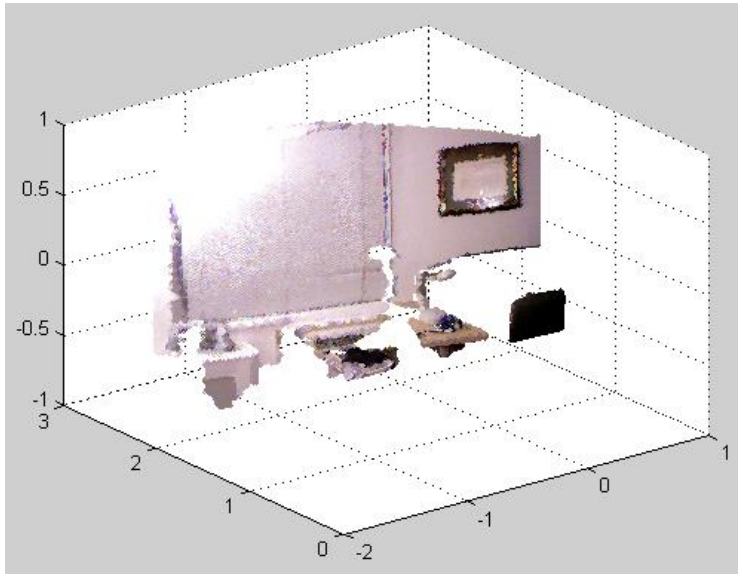
(c)

Kinect Reconstruction








1
0.5
0
-0.5
-1
3
2
1
0
-2
-1
0
1

Objective

We are going to integrate RGB data and depth data from 2 Kinect V1 devices to reconstruct a scene.

You will be given a series of color and depth image pairs and you will reconstruct a scene using a point cloud.

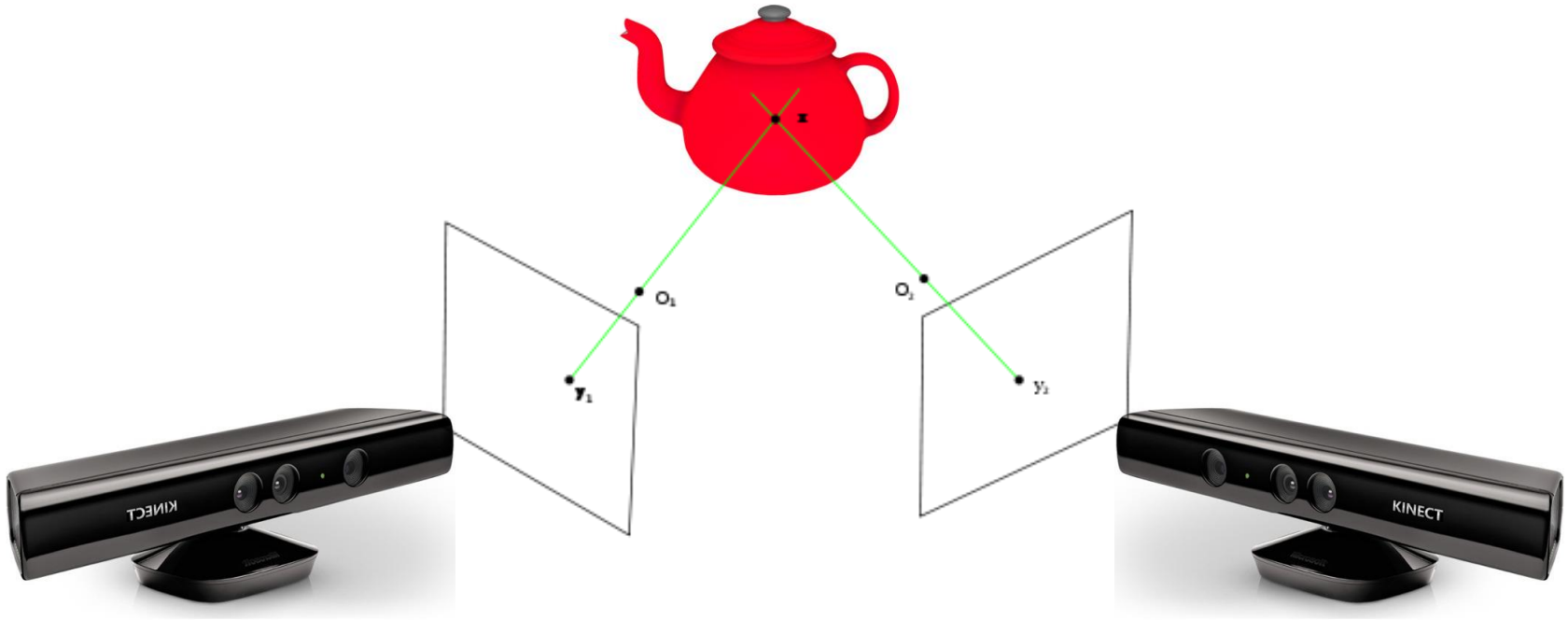
A point cloud is a way to represent the external surface of an object

Step by Step

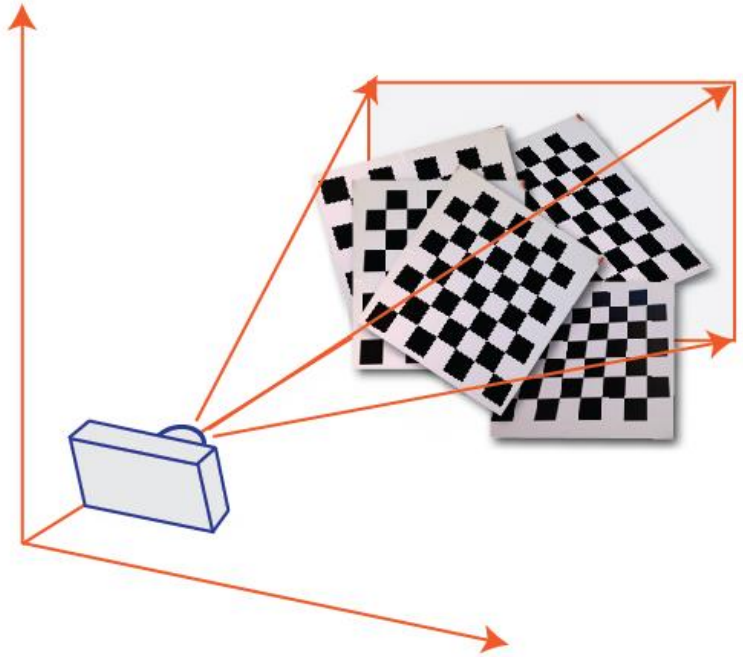
- Step 1: Image Acquisition
- Step 2: Camera Calibration
- Step 3: 3D-Reconstruction

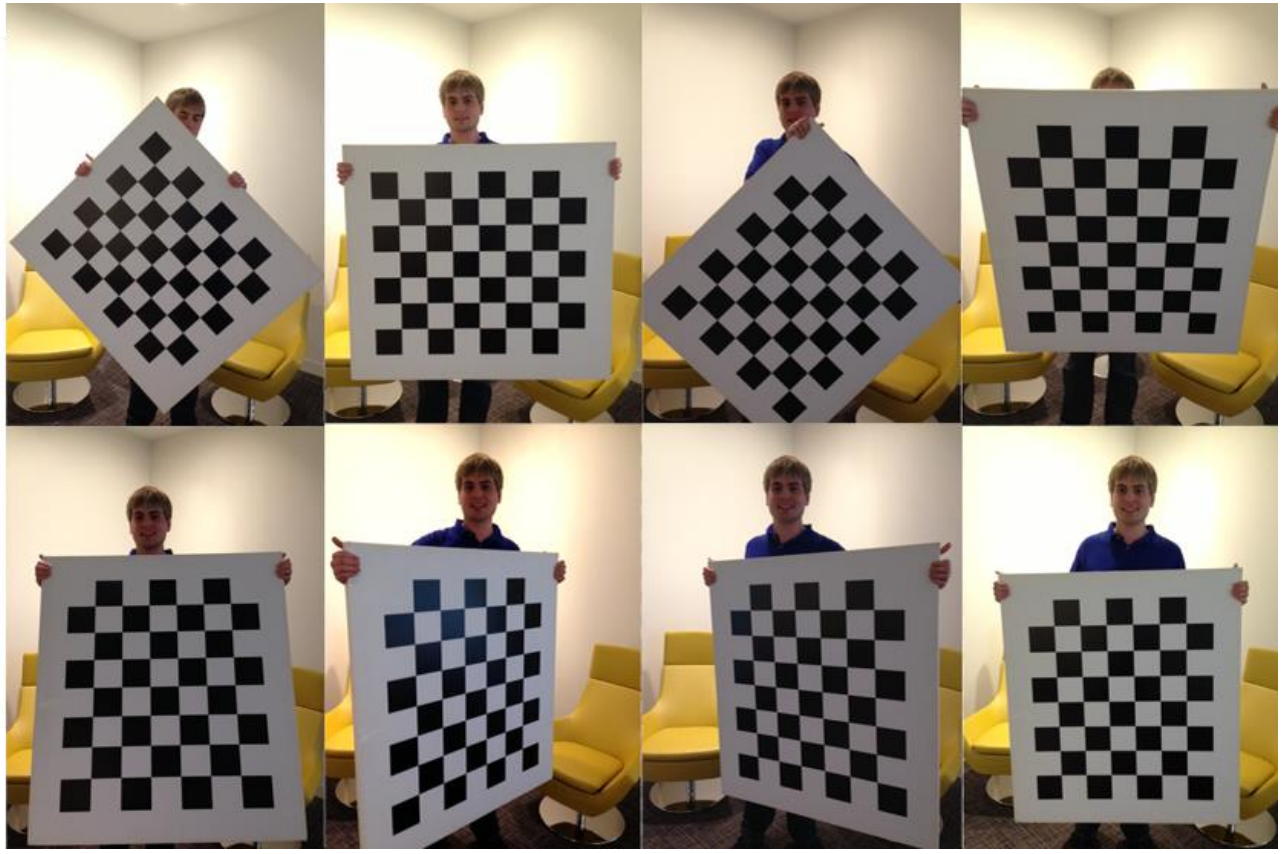
Step 1: Image Acquisition

Obtain a set of image RGB and depth pairs from the Kinect stereo system



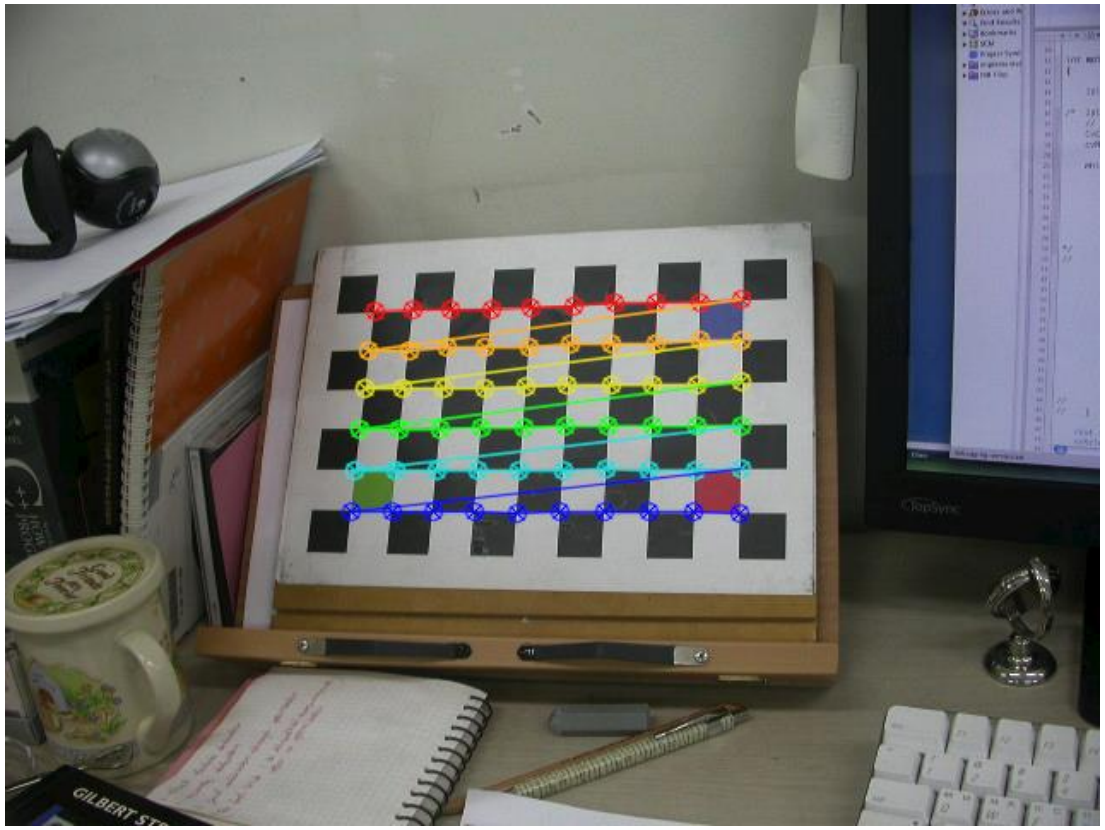
Checkerboard Calibration Technique





Step 2: Calibration

- **Detect the corner points of the checkerboard**
- Calibrate each camera separately (to get intrinsic parameters)
- Calibrate one camera with respect of each other(to get extrinsic parameters)
- Calibrate RGB data with respect of Depth data of Kinect



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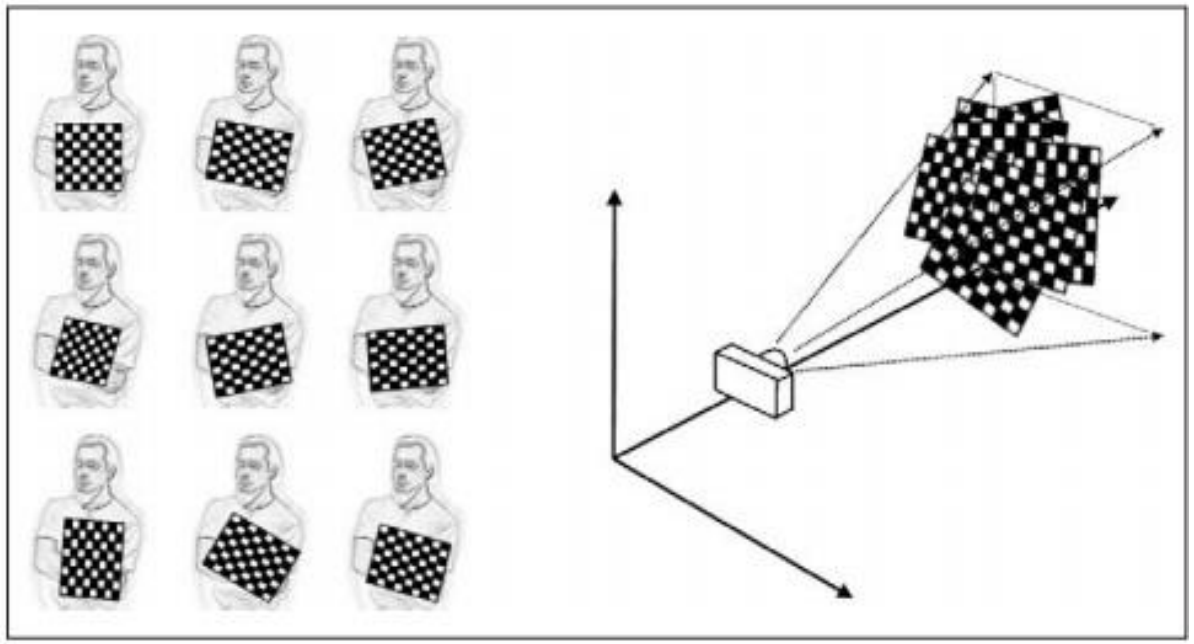

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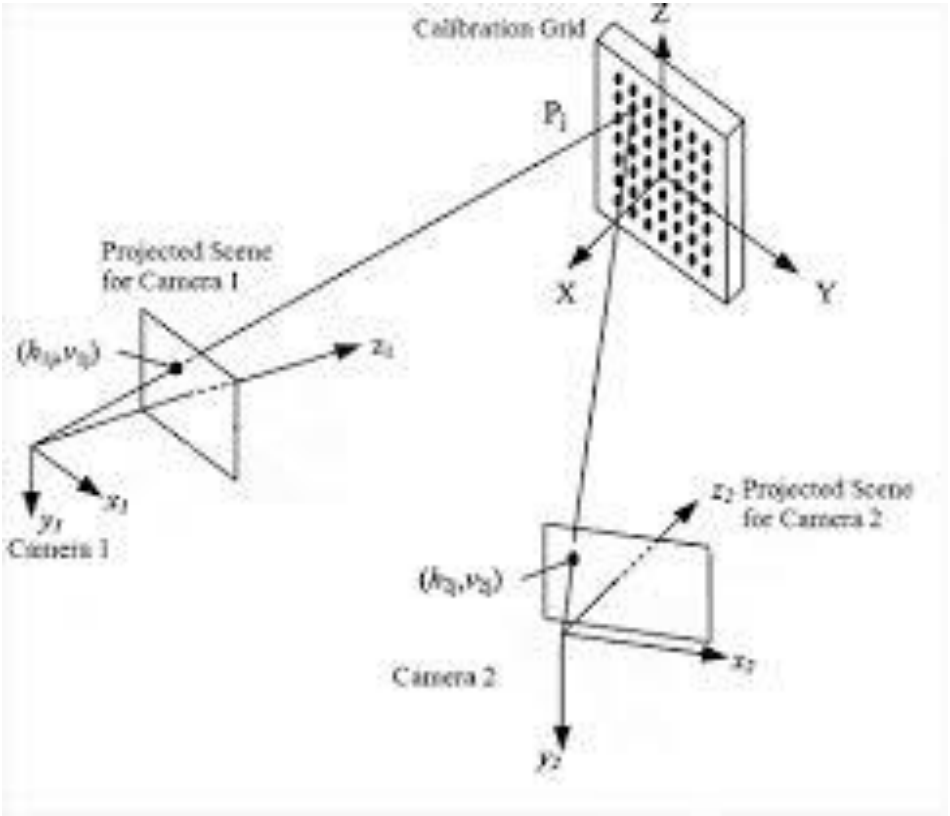

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Step 3: 3D Reconstruction

Project All the information w.r.t to the left camera

Use the information from both depth and color cameras to create a point-cloud version of the captured scene