CS 6327 Video Analytics Assignment 3

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Due – March 5th, 2016

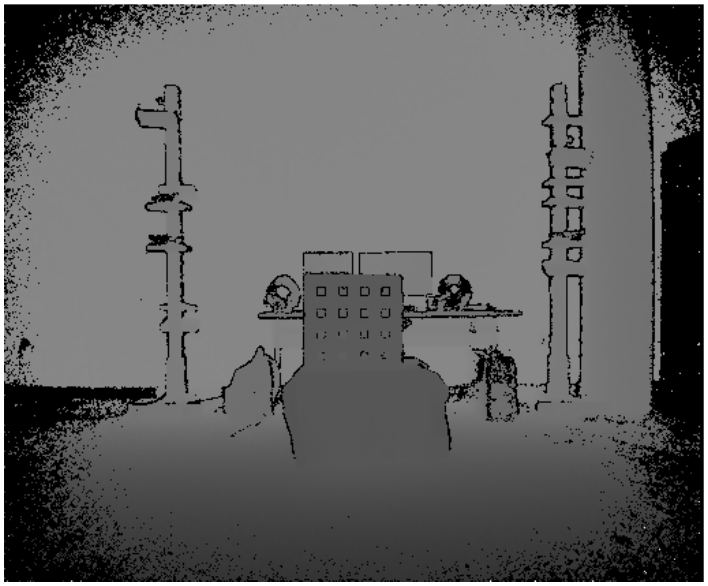
The only submission on eLearning is accepted.

Description:

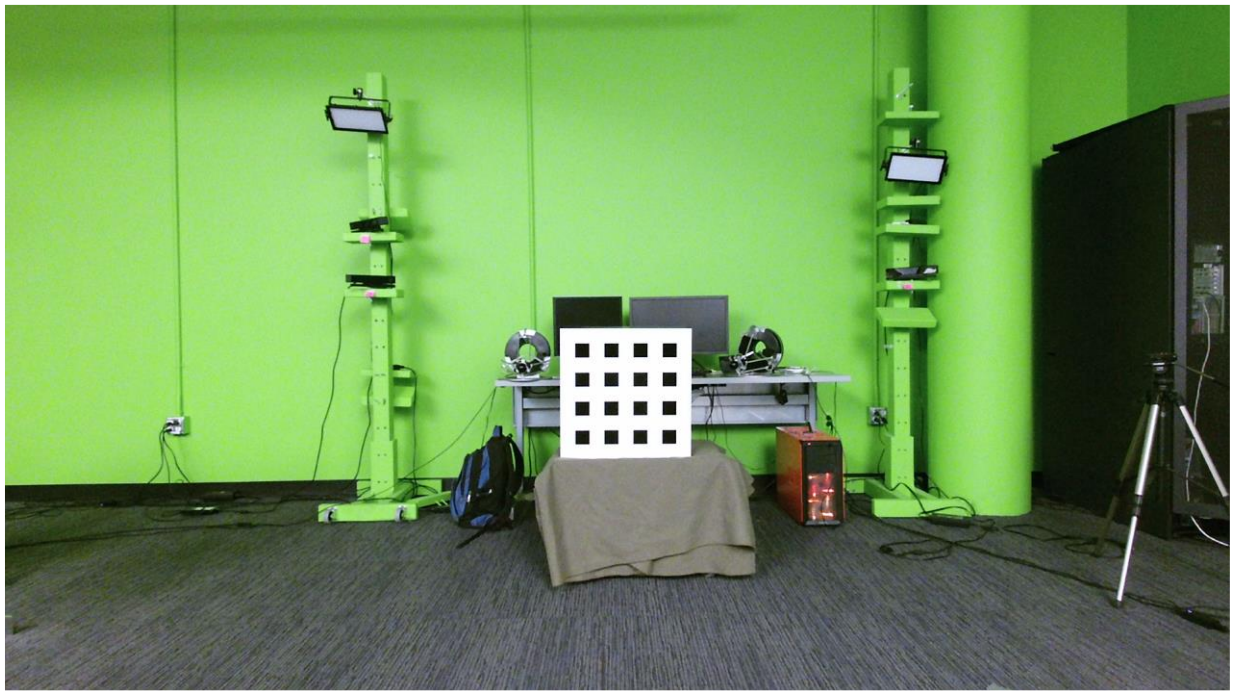
Microsoft Kinect provides a color and depth information of the scene. For this assignment, we will provide you the color and depth frame obtained from Kinect. Camera intrinsic matrix for RGB camera, the inverse of camera intrinsic matrix of the depth camera and rotation matrix between RGB and depth camera are also provided.

1) Using these matrices, find a corresponding color for each pixel in the depth image. This will generate a colorized depth image.
2) In colorized depth image, detect a white box using the color-based object detection. Draw the bounding box around the white box. Using the width and height of the white box in pixels, the inverse camera intrinsic matrix for depth camera and depth value at the center of the bounding box compute the **width and height of the white box in cms**.

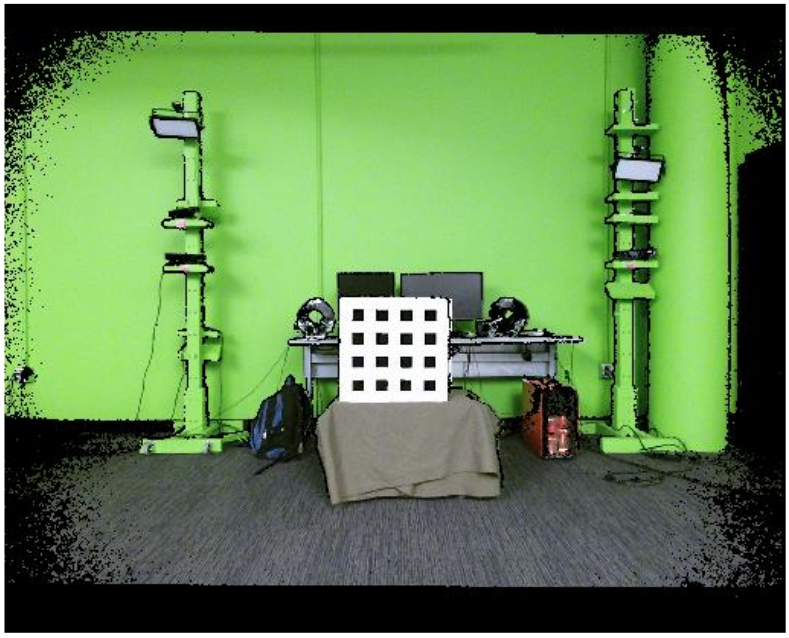
Depth Image:



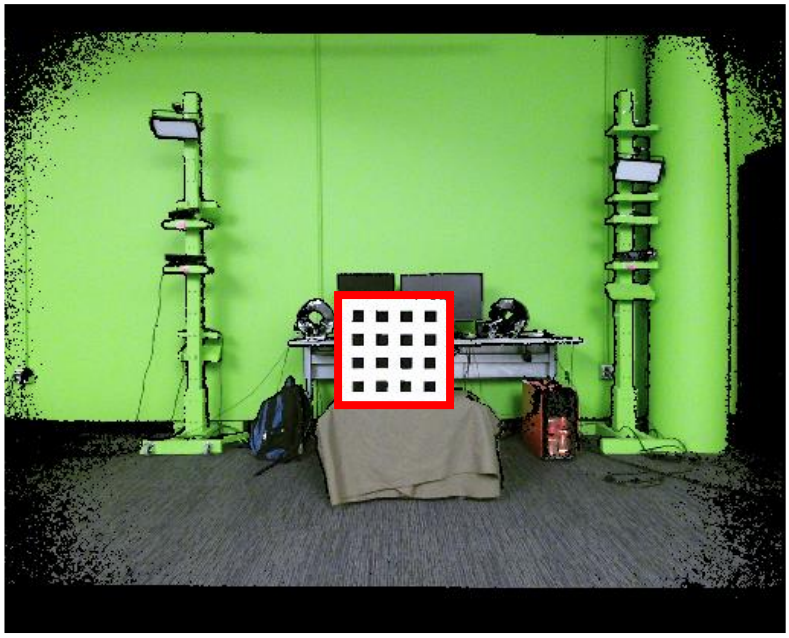
Color Image



Colorized Depth Image



Bounding box indicating white box detection:



This assignment will require a good understanding of intrinsic matrix, rotation/translation between two coordinate systems. It will help you to understand the mapping between 2D-3D. It will also require to implement the code for vector to matrix multiplication in order to apply transformations to a point.

All the images and files for transformations will be made available at eLearning.

Where to submit the assignment:

eLearning.

Late Submissions: Accepted. However, there will be a penalty when you are late.

Rubrics:

Colorized depth image generation	– 40 points.
Color-based object detection	-- 10 points
Marking the bounding box around the orange	-- 10 points
Computing the dimensions of white box in centimeters	-- 40 points