Assignment 2

RRC summer sessions 2019

May 15, 2019

1 Instructions

- Python or MATLAB are preferable languages.
- Try to build a toolbox for common functions you will be working with.
- Deadline May 16th 2019 11:00 PM, (by email: mithun.babu@research.iiit.ac.in)

2 Direct Linear Transform

In this section, we will implement and test Direct Linear Transform (DLT) to calibrate a camera. We will use rubicks cube image for this section. Edge length of each block in rubicks cube is 19 mm.

1. Let us start by finding the correspondences between world points X_i and image points x_i manually. Write a function `correspondences3D2D` that allows user to select points graphically and input the world co-ordinates of selected point.
2. Write a function `calibrateDLT` that takes these sets of correspondences and returns projection matrix P.
3. Use the function `decomposeRQ` from assignment-1 to decompose P into K, R and t.

4. Write a function `visualizeScene` to visualize a scene having a 3D object(dummy cube) and a camera (translucent pyramid from Assignment-1).

5. How does your estimated parameters change if the edge length change to 190mm or 1900mm?

6. How can you compare your parameters with your friend's parameters and say which is the best?