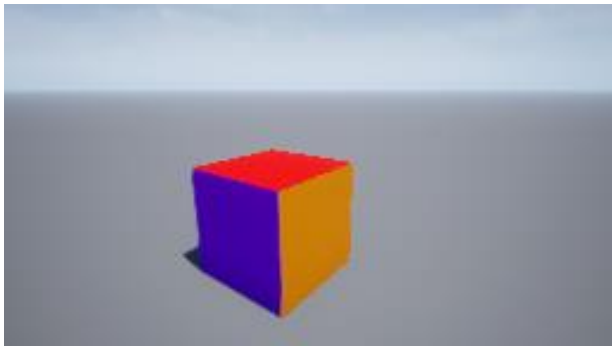
PreImage

Computer Vision Researcher - Assessment Task

You are given 30 files in totality, 10 each of types 0 (RGB), 1 (Segmentation) and 2 (Pose). The files are named in the format <id>_<type>.<extension> in individual folders.

Each image is 256x144 in size. The image data is collected using a projective pinhole camera, which has a horizontal FOV of 90°. You can assume the distortion parameters to be zero, and the principal point of the image to be at its centre. You can also assume the focal length in x and y directions to be equal.

The pose data is the position of the camera in the world coordinates in the NED (North, East, Down) coordinate system. The pose data is corrupted with a little noise. It is stored in the form of an orientation quaternion and a position vector. Brownie points if you're able to cancel the effect of the noise, but it's not entirely necessary.



The images capture a perfect cube placed in the 3D world, with six differently coloured faces. The cube is resting perfectly on the flat ground.

Using the given data, your task is to calculate:

1. The length of the side of the cube
2. The x, y, z coordinates of the centroid of the cube

You can use C++ or Python, and use any preferred library at your disposal.

Please reply with your submission (Code and a brief writeup) on the same e-mail thread. Do not hesitate to contact me (siddharth@preimage.ai , +917699087792) for any clarification.

All the best!