

ABSTRACT

This Final Task determines the algorithm for shape detection and parameter geometric estimation of 3 dimension object, so that we can estimate its wide and its volume. By Hough transforms, the shape of an object can be identified. Hough transform map an object into (rho, theta) plane and generate a Hough matrix uniquely for each different shape. World coordinate to camera coordinate calibration can determine the real size of an object, because the object (in the world plane) and shadow (in the image) have a constant comparison.

This Final Task used two web camera that are set in the different side of a 3 dimension object. Each image from each camera will be processed independently. Then, the information of each image (2 dimension form) will be merged so that we can get its 3 dimension object information. In this final task, there are two kinds of image, the direct image and file image. Size of each image is 320 x 480 pixel with bitmap or jpeg format. Three dimension object that will be analyzed in this Final task are; cube, beam, pyramid, tube, cone, and ball. This simulation will use MATLAB R2007a.

From the test result, camera calibration for each camera is different. For 1st camera, camera calibration for standing object is 0.002654, and for aslant object is 0.002996. and for 2nd camera, camera calibration for standing object is 0.002296, and for aslant object is 0.002745. The system will work well at 50 cm – 80cm of distance, color tolerance for 1st camera are 23 – 30 and for second camera are 15 – 20. Cube and beam can be easily detected and estimated by the system. Lightness, real size of the object, and the background color can influence the system performance.

Keywords : *webcam, Hough transform, world coordinate, camera coordinate*