

Indian Institute of Space Science and Technology Trivandrum

I SEMESTER , 2024

ExamType: Quiz 1

DEPARTMENT OF AVIONICS

computer vision/ computer vision and advanced image processing

(Time allowed: ONE hours)

NOTE: Read all questions first. There are questions worth 30 marks. If something is missing in a problem description, clearly mention your assumptions with your solution. If required, use sketches to illustrate your findings.

1. What is Homography? What is the use of tomography in computer vision? Explain the notion of the algebraic distance and the geometric distance in the context of estimating a homography. (5 marks)
2. write the camera matrix. What do the different rows and the different columns of the camera matrix stand for? Provide simple algebraic proofs for your answer. (5 marks)
3. Explain the working of Zhang's camera calibration scheme. Write the necessary steps required to obtain the camera calibrations. (Derivation is not required) (5 marks)
4. Parallel Lines under Perspective Transforms (5 marks)
 - (a) The two boxes in Figure 1 represent the same 3D shape rendered using two projective techniques, explain their different appearance and the types of projections used to map the objects to the image plane.

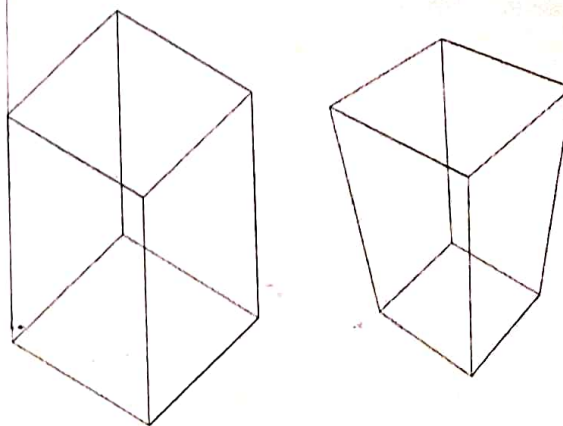


Figure 1: Boxes rendered using different projections