



# COMPUTER VISION

**PROF. JAYANTA MUKHOPADHYAY**

Department of Computer Science and Engineering  
IIT Kharagpur

**PRE-REQUISITES :** Linear Algebra, Vector Calculus, Data Structures and Programming

**INTENDED AUDIENCE :** Computer Science and Engineering, Electronics Engineering, Electrical Engineering

**COURSE OUTLINE :**

The course will have a comprehensive coverage of theory and computation related to imaging geometry, and scene understanding. It will also provide exposure to clustering, classification and deep learning techniques applied in this area.

**ABOUT INSTRUCTOR :**

Prof. Jayanta Mukhopadhyay, Professor in Computer Science and Engineering, IIT Kharagpur, and engaged in teaching and research in this area for about 30 years.

**COURSE PLAN :**

**Week 1:** Fundamentals of Image Processing

**Week 2:** 2-D Projective Geometry and Homography and Properties of homography

**Week 3:** Camera geometry

**Week 4:** Stereo geometry

**Week 5:** Stereo Geometry

**Week 6:** Feature detection and description

**Week 7:** Feature matching and model fitting

**Week 8:** Color Processing

**Week 9:** Range image processing

**Week 10:** Clustering and classification

**Week 11:** Dimensionality Reduction and Sparse Representation

**Week 12:** Deep Neural Architecture and applications