

CS5100
Homework 6
Computer Vision

Answer the following:

Question 1: (10 Marks)

Define the following terms in your own words.

- a. Active and passive sensing
- b. Image feature
- c. Object model
- d. Rendering model

Question 2: (10 Marks)

Compare three architectures for computer vision image classification: (1) convolutional neural networks (CNN), (2) vision transformers (ViT), and (3) multi-layer perceptron mixers (MLP-Mixer). Find relevant research and report on your findings.

Question 3: (20 Marks)

Vehicle detection is an important application of computer vision that helps in monitoring traffic, automating parking systems and surveillance systems. Using OpenCV, create a simple vehicle detection system, such that it detects vehicles in a given video.

Question 4: (10 Marks)

Object detectors are commonly evaluated with a metric known as mean average precision (mAP). Research this method and explain how it works.