<u>**CS5100**</u>

<u>**Homework 6**</u>

<u>**Computer Vision**</u>

<u>**Marking Guideline**</u>

<u>**Answer the following:**</u>

<u>**Question 1: (10 Marks)**</u>

Define the following terms in your own words.

      a. Active and passive sensing

      b. Image feature

      c. Object model

      d. Rendering model

2.5 Marks for each correction definition and related explanation.

<u>**Question 2: (10 Marks)**</u>

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.

Provide 4 or more points of comparison: 1.5 marks for each comparison (Total 6 points)

4 marks for references and intext citations, good clear answers.

<u>**Question 3: (20 Marks)**</u>

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.

16 marks for correct working code with appropriate comments

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.