Computer Vision: IT524

Course contents:

This course provides introduction to computer vision. Starting from fundamentals concepts to solving some real life problems of computer vision with day to day use. Topics covered are basis knowledge of image processing, image formation, cameras, and camera geometry. Projective geometry, feature extraction, feature formation, feature matching. Single view geometry and multiple view geometry. Camera calibration both single camera and stereo cameras. Extracting real world information from images, automated alignment of images takes with restricted camera motion (e.g. panoramas), and tracking. Face detection, object detection, video processing and tracking. Clustering, classification, segmentation, different approaches to image and video segmentation. Time permitting we will also cover some basics of convolution neural networks (CNNs) and its applications in computer vision.

The course will be delivered via lectures and practicals. For conducting practicals we will provide students with documents and some help via a teaching assistant in installing an open source software and platform called OPENCV. Being able to install and operate OPENCV on your computing facility will be essential. Therefore we suggest that during the start of this course please try out installing OPENCV and using it on your computing hardware. In case you are not able to do this then we definitely suggest that you drop this course.

Course Pre-requisite:

Programming knowledge in Matlab, Python, C/C++ or a similar tool is essential. You need not know programing on all the platforms, any one will suffice.

Mathematics to first year graduate level e.g. matrixes and its transforms, co-ordinate geometry, probability and statistics, graph and graph theory.

Course Evaluation:

A rough guideline for evaluation of this course is the following. We will discuss the details in the beginning of the course and mutually finalize it. The idea is to give students a change to have a say in their evaluation process.

Assignment1 worth 20 % marks

Assignment 2 or Project worth 25 % marks includes a report and a presentation

Lab/practical (10-12) worth 20% Some times we have quizzes too but not sure for online delivery.

Final exam (end sem) worth 30% marks
Course delivery:

The course materials and information’s regarding assignments etc. will be made available via https://moodle.daiict.ac.in. At present I am working on preparing the course repository. The Moodle at DAIICT is quite restrictive so let’s be co-operative. Let’s hope for the best and live with whatever we get.

The media of instruction will be via an online platform. I will use the platform which DAIICT as institute makes it available to its faculties. Faculties have gone through some discuss on this matter but I am not aware of institute decision on this and therefore cannot state precisely how the online lectures will be delivered.