

CS 862: Advanced Image Processing

Image processing underpins computer vision. No mentionable work can be done in vision without proper grounding in image processing. Even students who have already taken this course at the under-grad level are not familiar with the techniques that fall in the advanced category. It would be useful for both first time and experienced students. It is not offered by any of the universities we have compared our program with but we feel that its inclusion is essential for us.

Recommended Books:

1. Advanced Image and Video Processing Using Matlab, Shengrong Gong, Chunping Liu, Yi Ji, Springer, 2019.
2. Hands-On Image Processing with Python: Expert techniques for advanced image analysis and effective interpretation of image data, Sandipan Dey, Packt Publishing, 2018.
3. Principles of Digital Image Processing: Advanced Methods, Wilhelm Burger, Mark J. Burge, Springer, 2013.

Credit Hours: 3 (3, 0)

Course Objectives:

- To introduce students to advanced theoretical concepts.
- To develop in students the problem solving skills and build in them engineering intuition.
- To inculcate practical skills and know how to be able to build working computer vision based systems.

Topics / Contents	Allocated Periods
The topics include color, camera models and calibration, scale in image processing, line and corner detection, and maximally stable extremal regions. It also includes topics related to mathematical morphology such as binary, gray-scale, skeletonization, granulometry, and morphological segmentation. It would also cover image compression, texture, and image registration including rigid, non-rigid, and RANSAC.	45