

PRASAD V. POTLURI SIDDHARTHA INSTITUTE OF TECHNOLOGY

(Autonomous)

Kanuru, Vijayawada-520007

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (Data Science)**IV B Tech – I Semester (Data Science)**

Unit No.	Syllabus Contents	Mapped CO
I	Introduction: Computer Vision, Image representation and image analysis tasks, Image representations, digitization, properties, Color images, Data structures for Image Analysis, Levels of image data representation, Traditional and Hierarchical image data structures.	CO1, CO2
II	Image Pre-Processing: Local pre-processing, Image smoothing, Edge detectors, Zero-crossings of the second derivative, Scale in image processing, Canny edge detection, Parametric edge models, Local pre-processing in the frequency domain, Line detection by local pre-processing operators, Image restoration.	CO1, CO2
III	Object Detection Using Machine Learning: Object detection, Object detection methods, Deep Learning framework for Object detection, Bounding box approach, Intersection over Union (IOU).	CO1, CO3, CO4
IV	Deep Learning Architectures: R-CNN, Faster-R-CNN, You Only Look Once (YOLO), Salient features, Loss Functions, YOLO architectures.	CO1, CO3, CO4
V	Face Recognition and Gesture Recognition: Face Recognition, Introduction, Applications of Face Recognition, Process of Face Recognition, Deep Face solution by Facebook, Face Net for Face Recognition, Implementation using Face Net, Gesture Recognition.	CO1, CO3, CO4

Learning Resources**Text Books**

1. Image Processing, Analysis, and Machine Vision, Thomson Learning, Milan Sonka, Vaclav Hlavac, Roger Boyle 2013
2. Computer Vision Using Deep Learning Neural Network Architectures with Python and Keras, Vaibhav Verdhhan, 2021, A Press.

References

1. Computer Vision: Algorithms and Applications, Richard Szeliski, 2nd edition, 2022, Springer
2. Computer Vision: Principles, Algorithms, Applications, Learning, E. R. Davies, 5th edition, 2017, Academic Press
3. Digital Video Processing, A. Murat Tekalp, 2nd edition, 2015, Pearson, 2015

e-Resources and other Digital Material

1. <https://www.labellerr.com/blog/video-intelligence-tools/>
2. <https://facit.ai/insights/video-analytics-guide>