CS7GV1: Computer Vision

Course Number : CS7GV1
Instructor : Dr. Subrahmanyam Murala
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Wednesday : 9.00 AM – 11.00 AM (Lloyd Institute (INS))

COURSE SYLLABUS

UINT-I: Introduction to Computer Vision

- ❑ Introduction of CV
- ❑ Applications of CV
- ❑ Linear Filters
- ❑ Edge Detection
- ❑ Image Pyramids

COURSE SYLLABUS

UINT-II: Feature Detection and Matching

- ❑ Interest points and Harris corner detection
- ❑ Scale Invariant Keypoints
- ❑ Scale Invariant Feature Descriptors (SIFT)
- ❑ Speed Up Robust Features (SURF) (Self Study)

COURSE SYLLABUS

UINT-III: Multiple Views and Motion

- ❑ Stereo Introduction
- ❑ Camera Calibration
- ❑ Stereo Correspondence
- ❑ Optical Flow
- ❑ Motion Detection in Videos

COURSE SYLLABUS

UINT-IV: Machine Learning for Computer Vision

- ❑ K- Nearest Neighbor (KNN)
- ❑ Neural Networks (NN)
- ❑ Deep Lerning-Convolutional Neural Networks (CNNs)
- ❑ Auto-Encoders
- ❑ Deep Generative Models
- ❑ Diffusion Models
- ❑ Transformers

COURSE SYLLABUS

UINT-V: DL for Computer Vision Applications

- ❑ CNN architectures for Classification
- ❑ Regression Applications
- ❑ Sematic Segmentation
- ❑ Motion Detection (FlowNet)
- ❑ Scene Understanding, etc.

TEXT BOOKS

- **Richard Szeliski, "Computer Vision: Algorithms and Applications," Springer, 2010.**
- **Rafael C. Gonzalez, Richard E. Woods, Digital Image Processing, Prentice Hall.**
- **Research Publications (*will be provided during lectures*).**

EVALUATION CRITERIA:

Method	Marks (%)
Examinations	35%
Final Project	35%
Assignments	30%

- **Assignments:** 30% (3-5 python coding assignments)
- **Examinations:** 35% (3 quizzes will be conducted, each lasting 30 minutes, with weightings of 8%, 12%, and 15% respectively)
- **Final Project:** 35% (includes project demo and presentation)

Course Syllabus