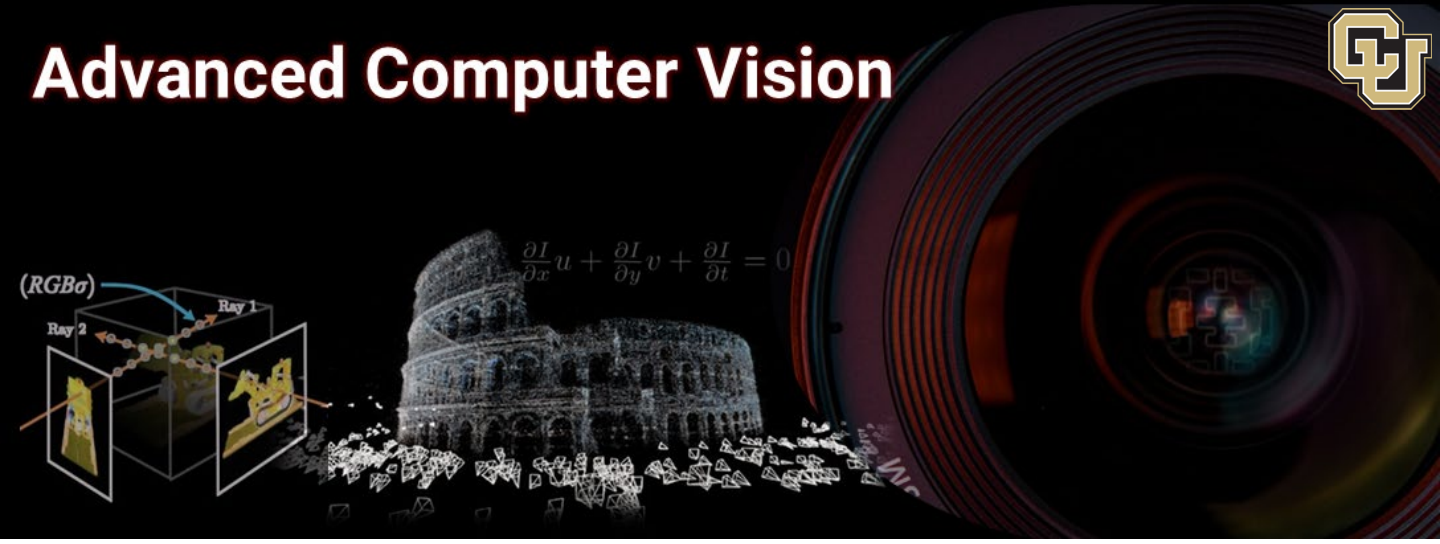

ROBO/MCEN 4085: Advanced Computer Vision

Geometry and Learning-based Methods in Computer Vision

by Chahat Deep Singh

NEW COURSE

This is an advanced graduate course that deals with classical (or geometric) and deep learning methods in computer vision. This course starts by exploring the mathematical foundations of computer vision and advances to the recent deep learning methods. The course objective is to introduce formal tools in perception for students who are interested in Robot Autonomy and 3D Perception.

In particular, this course will cover (but not limited to) the following topics:

- Camera Sensors and Image Formation
- Camera Calibration
- Single View Geometry
- Projective Transformation
- Multi-view Geometry
- Visual Odometry and Structure from Motion
- Optical Flow
- Computational Imaging Methods
- Radiance Fields and Volume Rendering
- Learning-based Methods for Depth Estimation and Reconstruction

Details to follow

Note: Pre-requisites include Linear Algebra and proficiency in Python (or any other scripting language). Students **DO NOT** require an understanding of computer vision before enrolling in this course.

For previous courses offered by Chahat Deep Singh, please visit http://chahatdeep.github.io/teaching.