CS194-26/294-26: Intro to Computer Vision and Computational Photography

Computer Science Division
University of California Berkeley

INSTRUCTOR: Alexei (Alyosha) Efros (Office hours: after lecture)
GSI: Zhe Cao (Office hours: 9 - 10 AM Fri)
Tutors: Chenyue Cai (Office hours: 8 - 9 AM Mon, Email: chenyue_cai[at]berkeley[at]edu), Kenny Chen (Office hours: 9 - 10 M Wed, Email: kenchen10[at]berkeley[at]edu), Yibin Li (Office hours: 11 - 12 PM Thurs, Email: liyibin516[at]berkeley[at]edu), and Violet Yao (Office hours: 1 - 2 PM Tuesday, Email: violetyao[at]berkeley[at]edu).
Reader: Justin Wang (Email: justinyiwang[at]berkeley[at]edu)
UNIVERSITY UNITS: 4
SEMESTER: Fall 2020
WEB PAGE: http://inst.eecs.berkeley.edu/~cs194-26/fa20/
Q&A: Piazza Course Website
LOCATION: Remote (Zoom links are posted on Piazza)
TIME : MW 5:00 PM-6:30 PM

PREREQUISITES:

This is a heavily project-oriented class, therefore good programming proficiency (at least **CS61B**) is absolutely essential. Moreover, familiarity with linear algebra (**MATH 54** or **EE16A/B** or Gilbert Strang's online class) and calculus are vital. Experience with neural networks (e.g. **CS189**) is a plus. For these taking **CS294-26**, consent of instructor is required to register (please sign up on the waitlist first).

COURSE DESCRIPTION:

The aim of this advanced undergraduate course is to introduce students to computing with visual data (images and video). We will cover acquisition, representation, and manipulation of visual information from digital photographs (image processing), image analysis and visual understanding (computer vision), and image synthesis (computational photography). Key algorithms will be presented, ranging from classical (e.g. Gaussian and Laplacian Pyramids) to contemporary (e.g. ConvNets, GANs), with an emphasis on using these techniques to build practical systems. This hands-on emphasis will be reflected in the programming assignments, in which students will have the opportunity to acquire their own images and develop, largely from scratch, the image analysis and synthesis tools for solving applications.