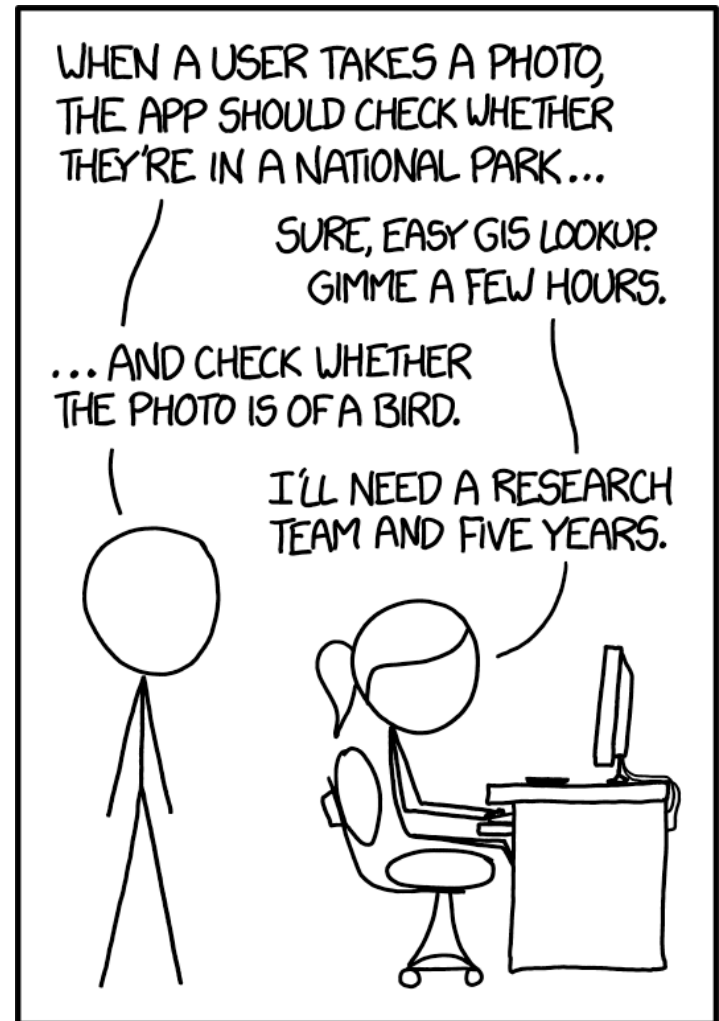

CS543 / ECE549

Computer Vision

Spring 2023

Course webpage URL:

<http://saurabhg.web.illinois.edu/teaching/ece549/sp2023/>

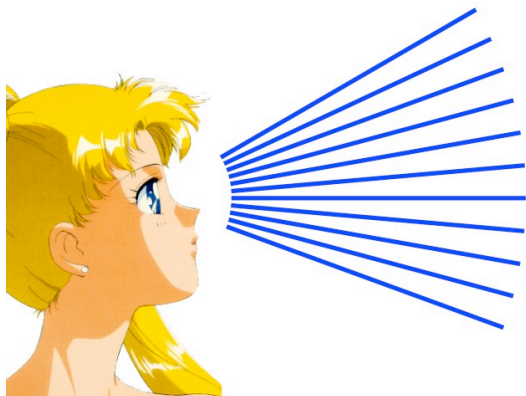


Course overview

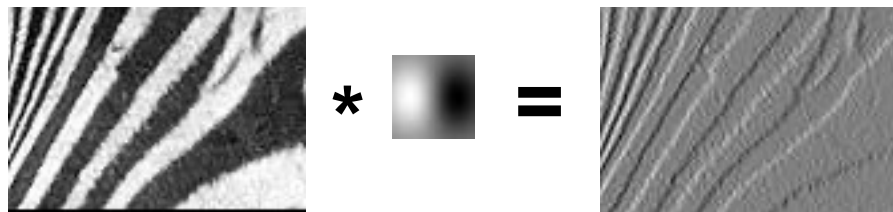
- I. Early vision: Image formation and processing
- II. Mid-level vision: Grouping and fitting
- III. Multi-view geometry
- IV. Recognition
- V. Additional topics

I. Early vision

Basic image formation and processing



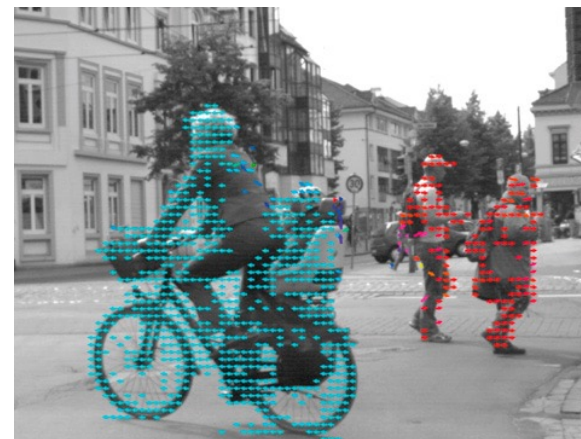
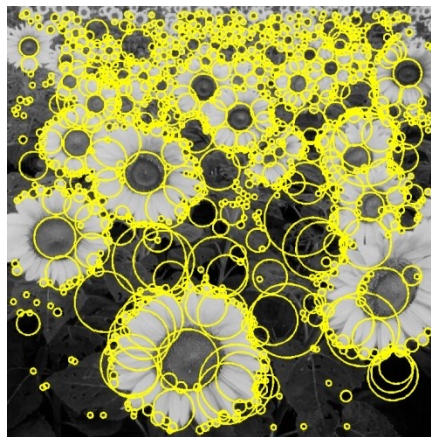
Cameras and sensors
Light and color



Linear filtering
Edge detection



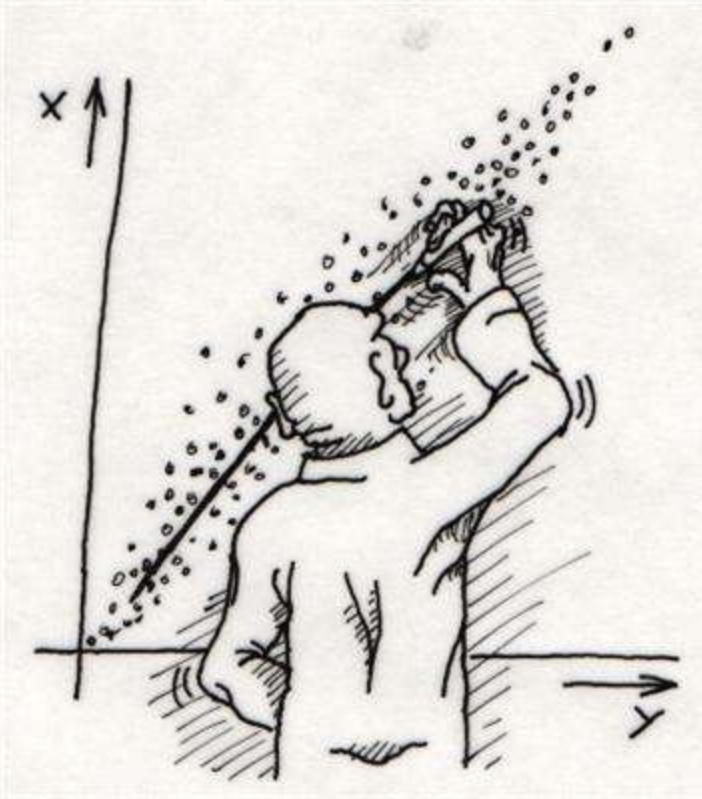
Feature extraction



Optical flow

II. “Mid-level vision”

Fitting and grouping

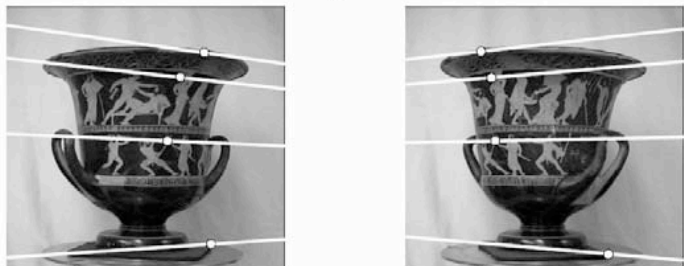


Fitting: Least squares
Voting methods



Alignment

III. Multi-view geometry



Epipolar geometry



Two-view stereo



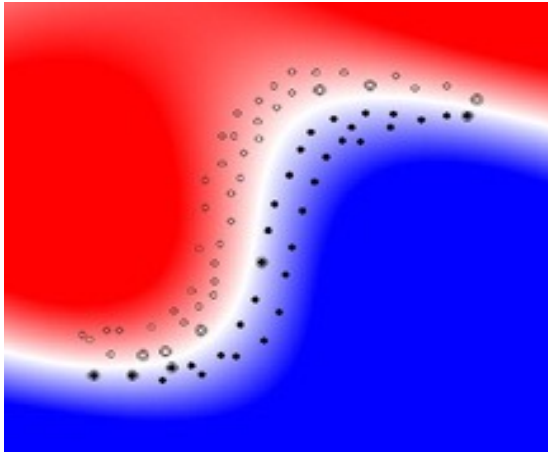
Драконъ, видимый подъ различными углами зрѣнія
По гравюру на мѣди изъ „Oculus artificialis teleiopticus“ Царя. 1702 года.

Structure from motion

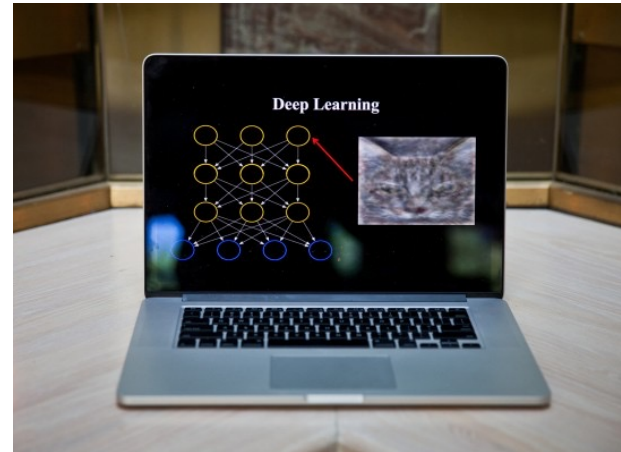


Multi-view stereo

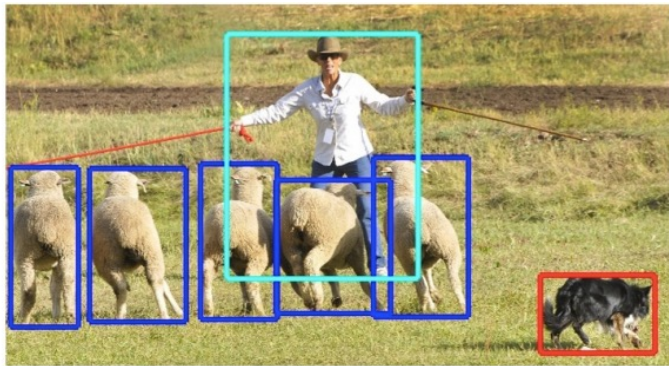
IV. Recognition



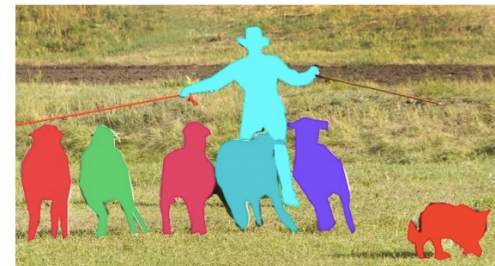
Basic classification



Deep learning



Object detection



Segmentation

What's next?

- [Machine Learning \(CS 446\)](#)
- [Applied Machine Learning \(CS 441\)](#)
- [Deep Learning for Computer Vision \(CS 444\)](#)
- **Advanced Classes:**
 - [Robot Perception](#) (Shenlong)
 - [3D Vision](#) (Derek)
 - [Robot Learning](#) (Saurabh, Yunzhu)
 - [Autonomous Vehicles](#) (DAF)
 - [Learning to Learn](#) (Yuxiong)
 - Efficient & Predictive Vision (Lynna)
 - Meta-Vision (Lana)
 - [Deep Generative and Dynamical Models](#) (Arindam)