

# Computer Vision

CSE 455

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# Course Information

- Time:
  - TTH: 10:00 to 11:20
- Location:
  - Zoom lectures: <https://washington.zoom.us/j/553420896>
- Contact:
  - [shapiro@cs.uw.edu](mailto:shapiro@cs.uw.edu) , CSE 634
- TAs:
  - Bindita Chaudhuri ADD PHOTOS
  - [bindita@cs.washington.edu](mailto:bindita@cs.washington.edu)
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  - Shima Nofallah
  - [shima@cs.Washington.edu](mailto:shima@cs.Washington.edu)
- Website:
  - <https://courses.cs.washington.edu/courses/cse455/20sp/>



# Topics

- Introduction
- Color and Texture
- Image Coordinates, Transforms, and Resizing
- Filters and Convolutions
- Edges and Lines
- Interest Operators, Image Matching, Image Stitching
- Motion, Optical Flow
- 3D Depth Perception
- Stereo
- Machine Learning Overview including Neural Nets
- Object Detection and Recognition with ML
- Convolutional Neural Networks
- CNN Applications

# Grading (tentative)

- Seven regular assignments (80%)
- One Course Project (20%)
- NO EXAMS (Yay!)

# Assignments

- Build a vision library from the ground up
- Mostly in C
- Play with advanced tools, neural networks
  
- Beginning: lots of skeleton code, explanations
- End: less guidance, more experimentation

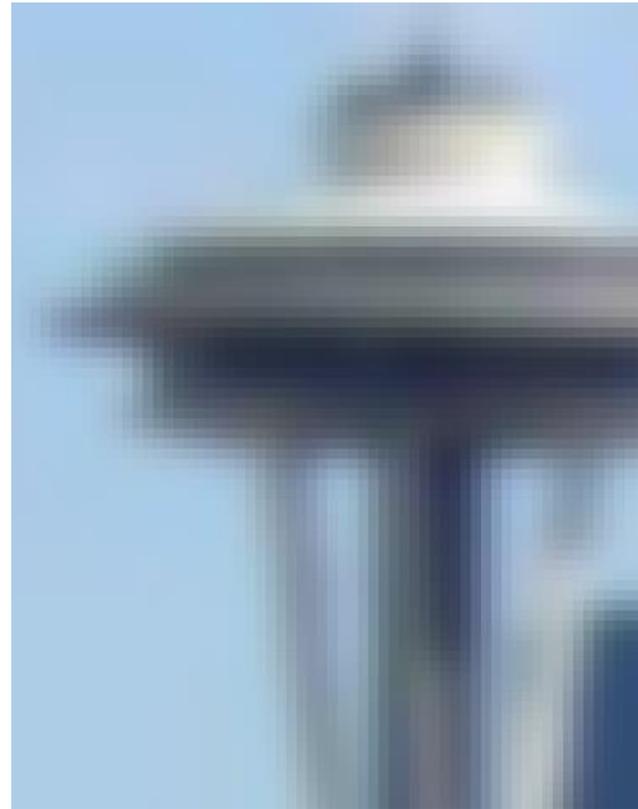
# Assignment 0: Fun with Color



# Assignment 1: Image Resizing



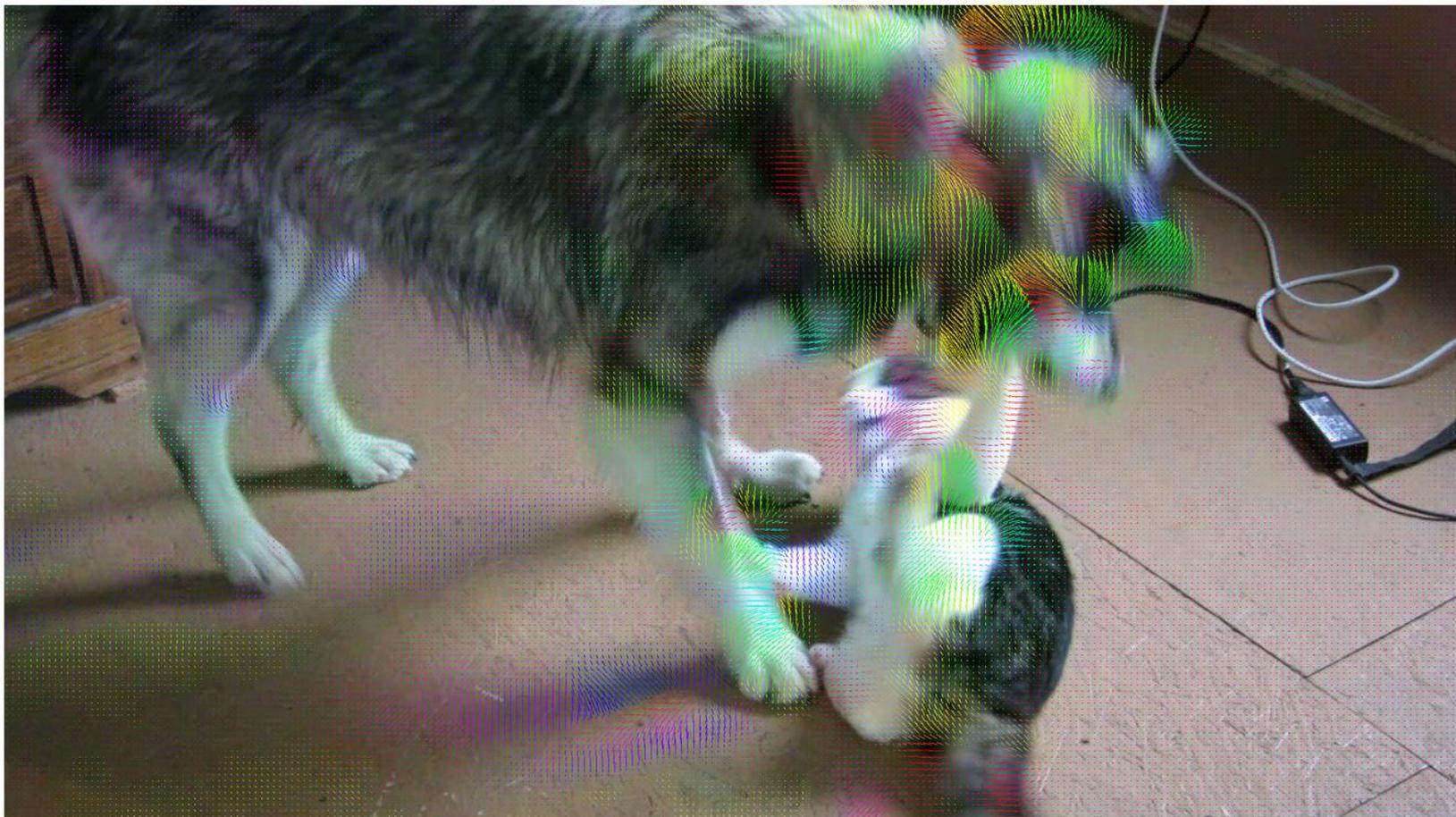
# Assignment 2: Image Filtering



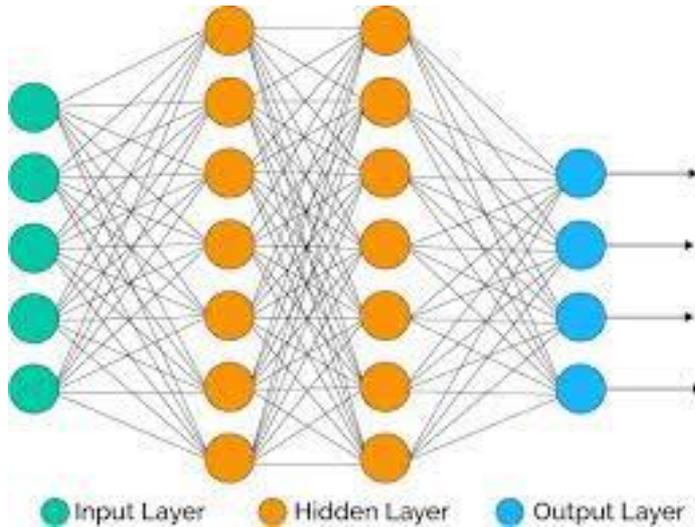
# Assignment 3: Panorama Stitching



# Assignment 4: Optical Flow



# Assignment 5: Neural Networks



Here are the classes in the dataset, as well as 10 random images from each:

**airplane**



**automobile**



**bird**



**cat**



**deer**



**dog**



**frog**



**horse**



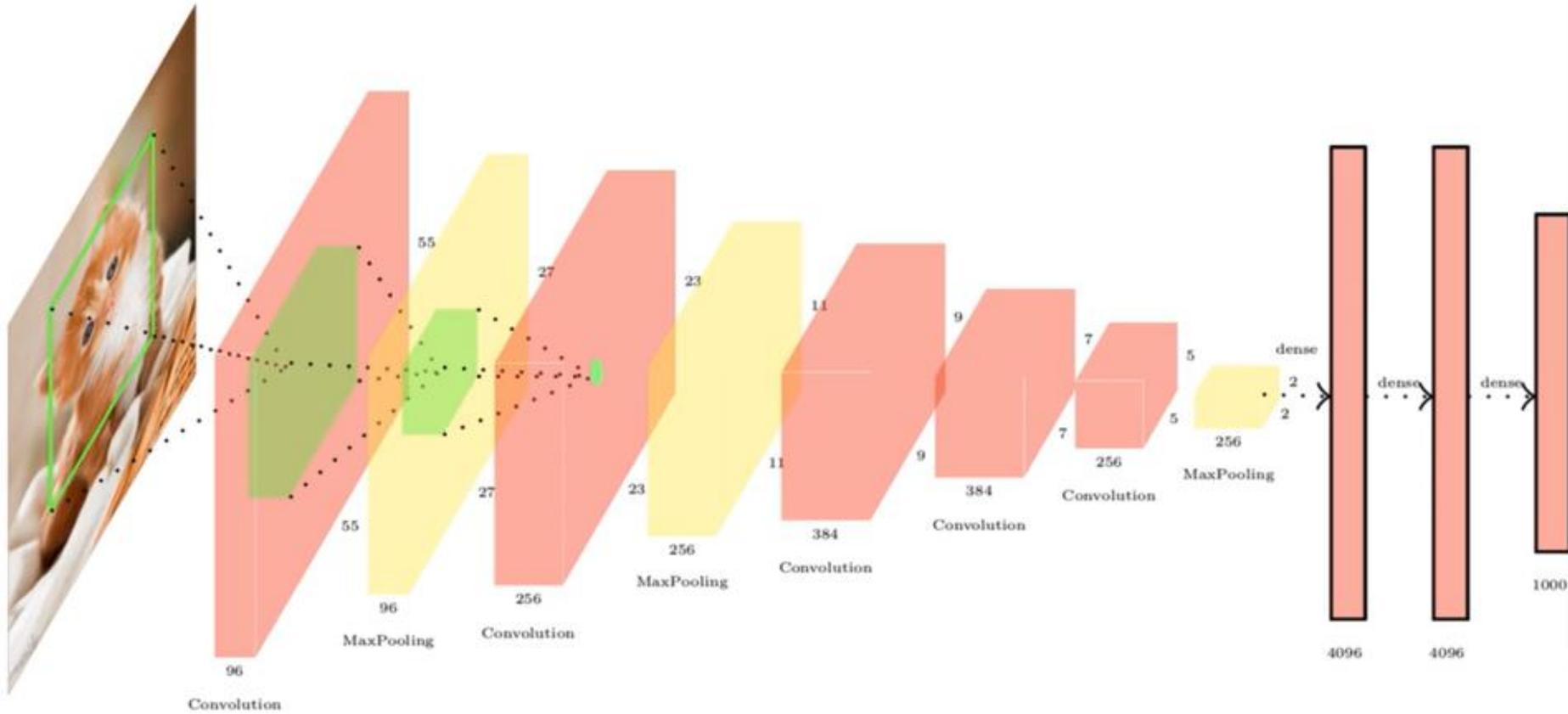
**ship**



**truck**

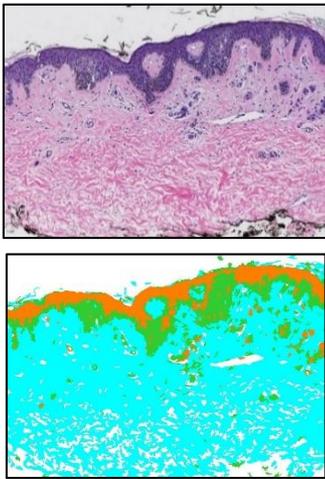
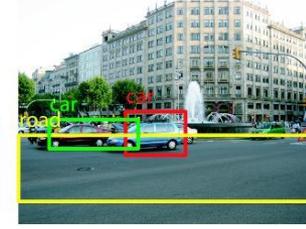
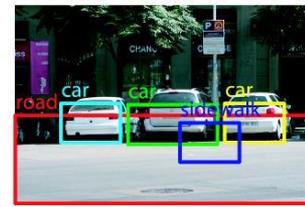
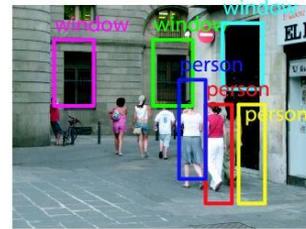
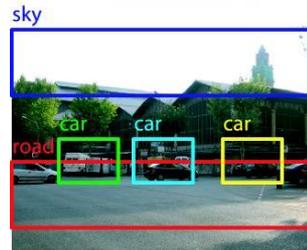
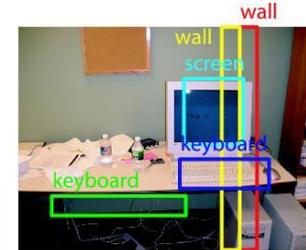
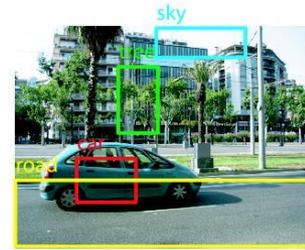
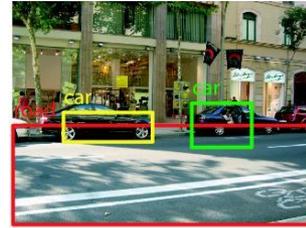
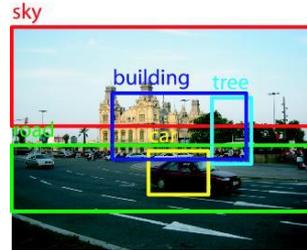


# Assignment 6: PyTorch

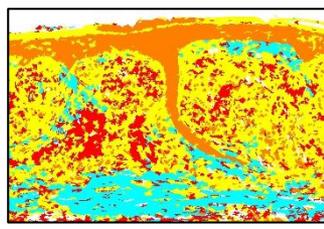
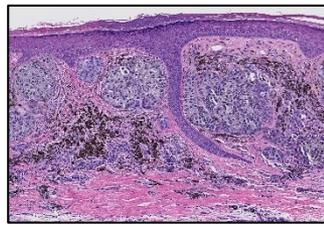


Input

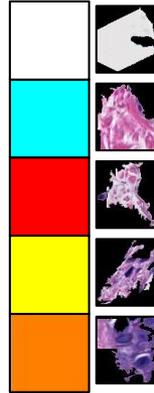
# Final Course Project: Machine Learning for Some Kind of Application



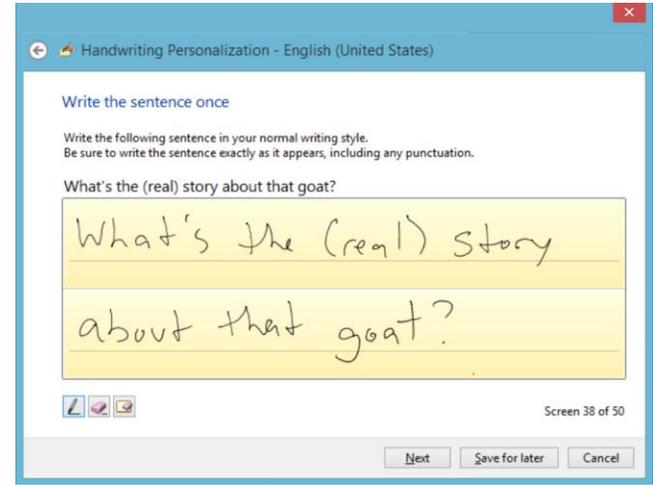
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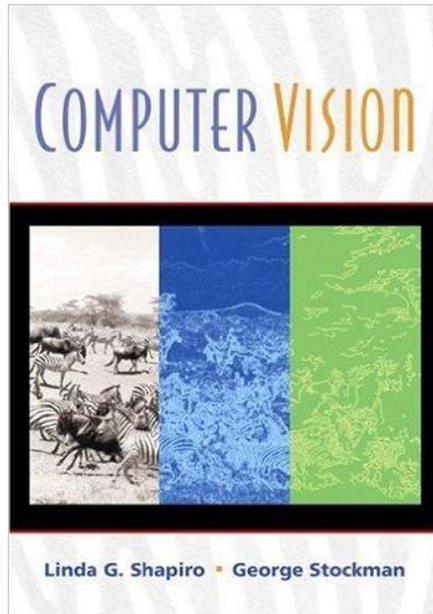
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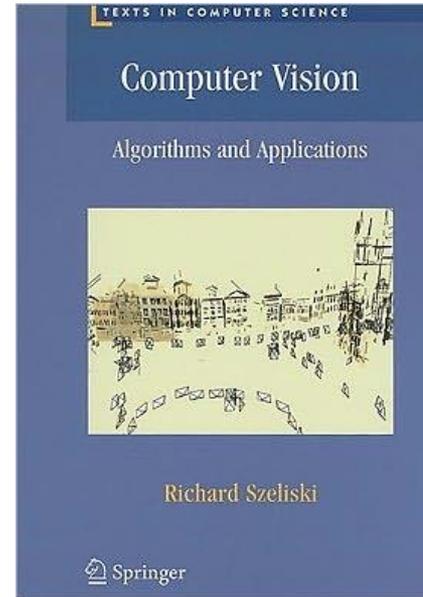
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# Books



Older, but designed for undergrads and has the basics. Chapters available from our web page.



Newest and available as a pdf online.

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