Website

http://www.cs.cmu.edu/~16385/

Assignments

https://blackboard.andrew.cmu.edu

Discussion&notes

https://piazza.com/cmu/spring2017/16385/home

(you can sign up here)

Project-based

a lot of programming

hours and hours of programming

days and days of debugging

Grading

- Projects: 90%
- Mid-term exam: 10% (open notes one page)

last year

- Projects: 100%

Projects

Project 1 Hough Transform (Lead TAs: Prakruti, Chen)
Project 2 Bag of Words (Lead TAs:Animesh, Shaurya)
Project 3 Convolutional Neural Nets (Lead TAs:Abhinav, Prakruti)
Project 4 Homography (Lead TAs:Shaurya, Animesh)
Project 5 Structure from Motion (Lead TAs:Chen, Prakruti)
Project 6 Lucas Kanade Tracking (Lead TAs:Shaurya, Animesh)
Project 7 Mean-shift Tracking (Lead TAs:Chen, Prakruti)

- Generous grading policy (like grad school)
- Getting an A vs. mastering the material
- Build your CV
- Take advantage of extra credit

Late days

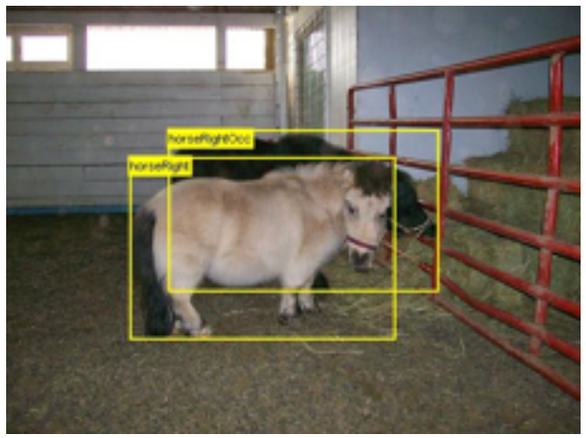
- 10% reduction of points per late day
- 3 free late days total (not per project)
- use them wisely… save them for project 5, 6 &7

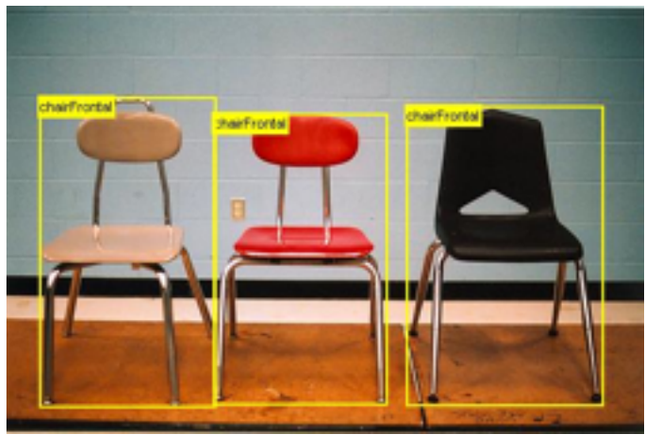
Introduction - Why you can succeed in this class?	
Jan 18	Intro, admin, projects, grading, overview
Special Topics - Why is computer vision useful?	
Jan 23	Social Impact
Jan 25	State of the Art and New Tech
Image Processing	
Jan 30	Filtering, Image Pyramids
Feb 1	Image Gradients and lines
Feb 6	Hough Transforms

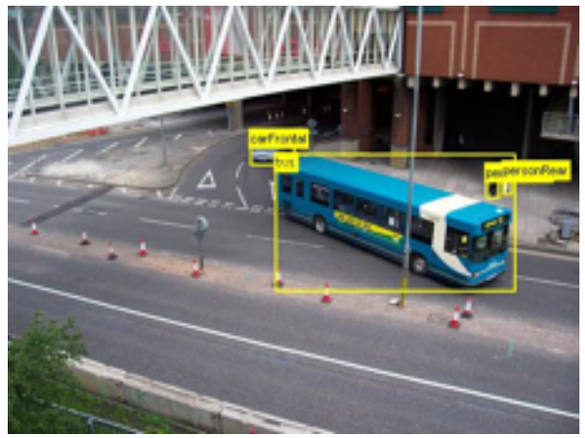
Image processing

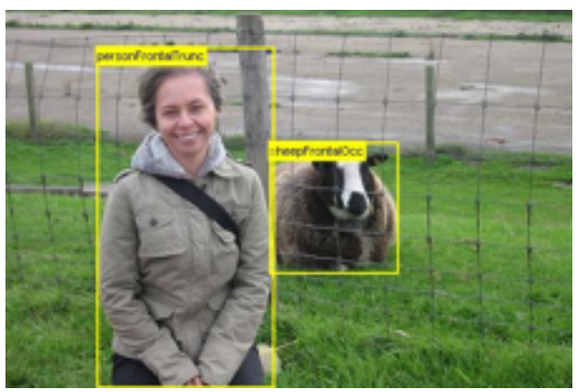
Image enhancement
Feature detection

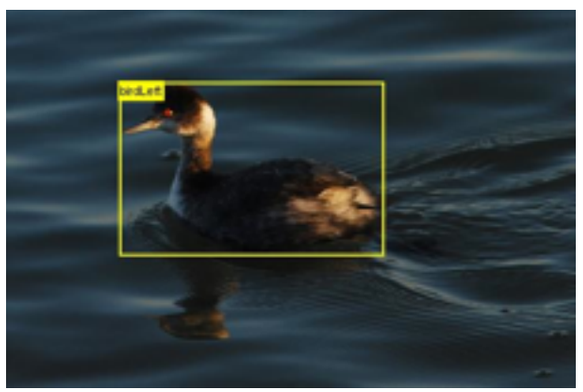
Object detection

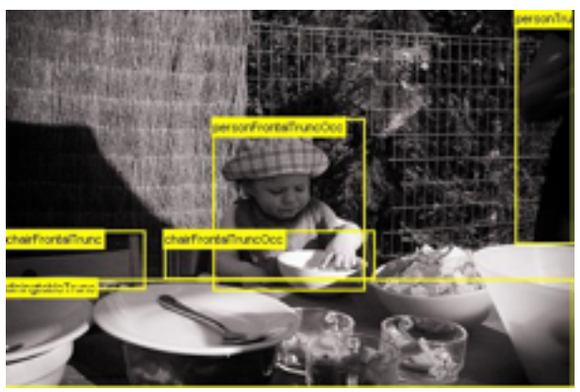












Visual Recognition	
Feb 8	Quadratics, Harris Corners, Multi-Scale
Feb 13	Feature Descriptors (MOPS, SURF, SIFT)
Feb 15	Probability, Object Recognition, Bag-of-Words
Feb 20	K-means, KNN, Naive Bayes, SVM

Convolutional Neural Networks	
Feb 22	Perceptron, Gradient Descent, BackProp
Feb 27	Convolution Neural Networks

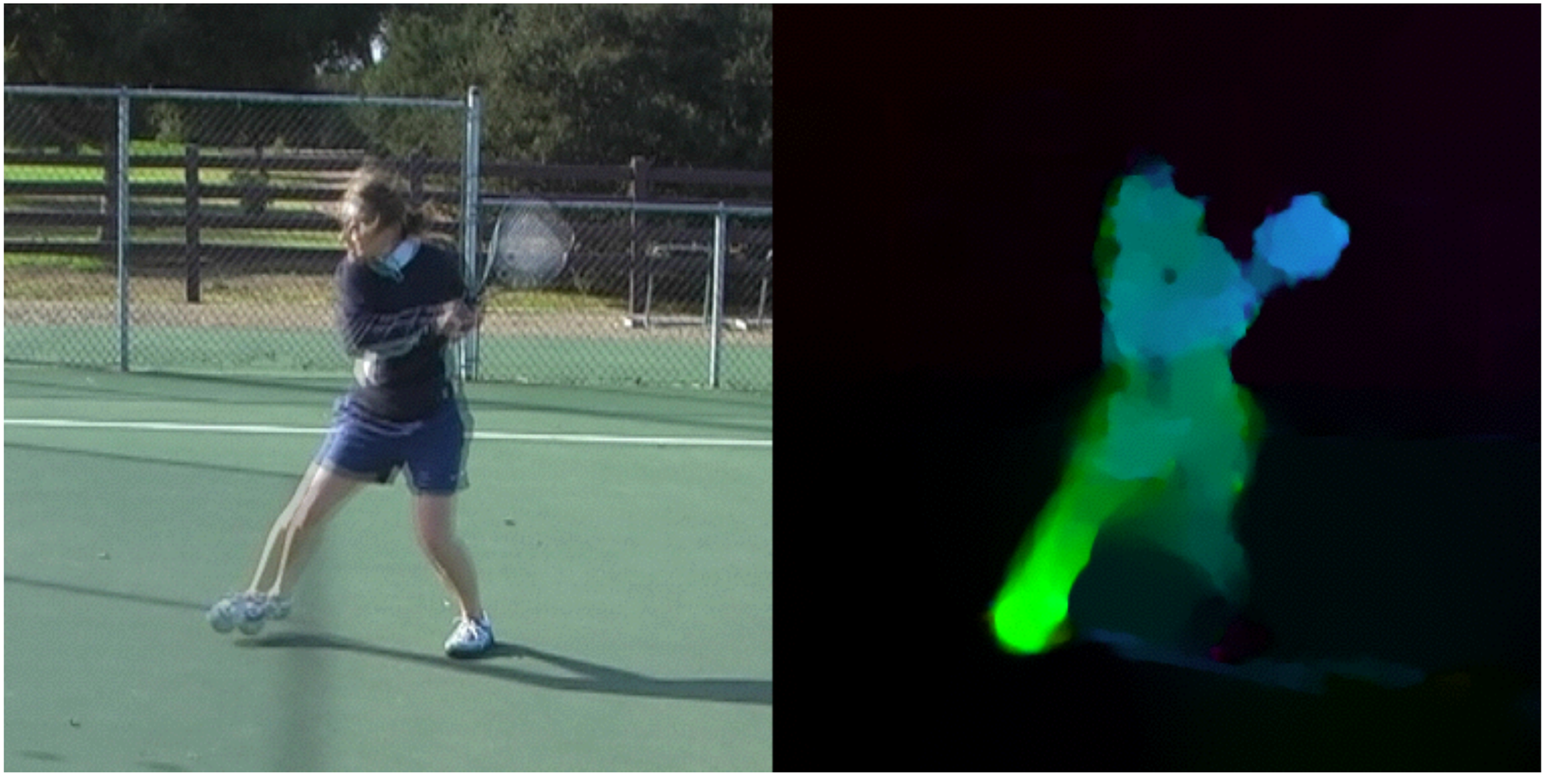
Image mosaicing

Structure from Motion

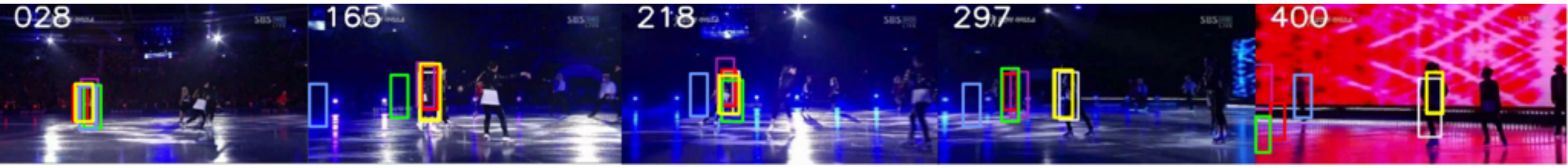
Binocular Stereo

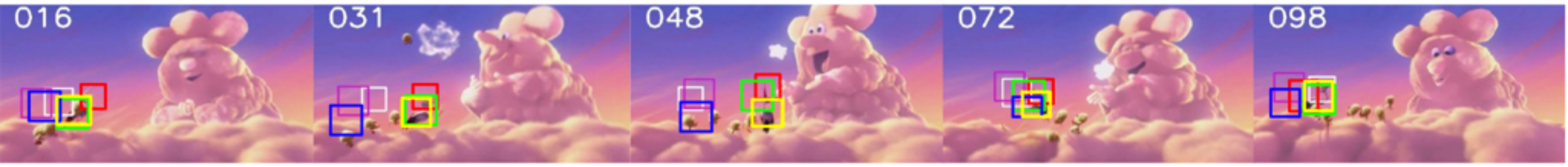
Image Transformations	
Mar 1	2D Transforms and Alignment (LLS)
Mar 6	2D Alignment (DLT, RANSAC)
Camera Matrix	
Mar 8	Camera Matrix, Pose Estimation, Triangulation
Mar 13	SPRING BREAK
Mar 15	SPRING BREAK
Structure from Motion	
Mar 20	Epipolar Geometry, Essential Matrix
Mar 22	Fundamental Matrix, 8 Point Algorithm
Mar 27	Structure from Motion
Stereo and Segmentation	
Mar 29	Stereo Rectification and Block Matching
Apr 3	TBA

Optical Flow



Tracking

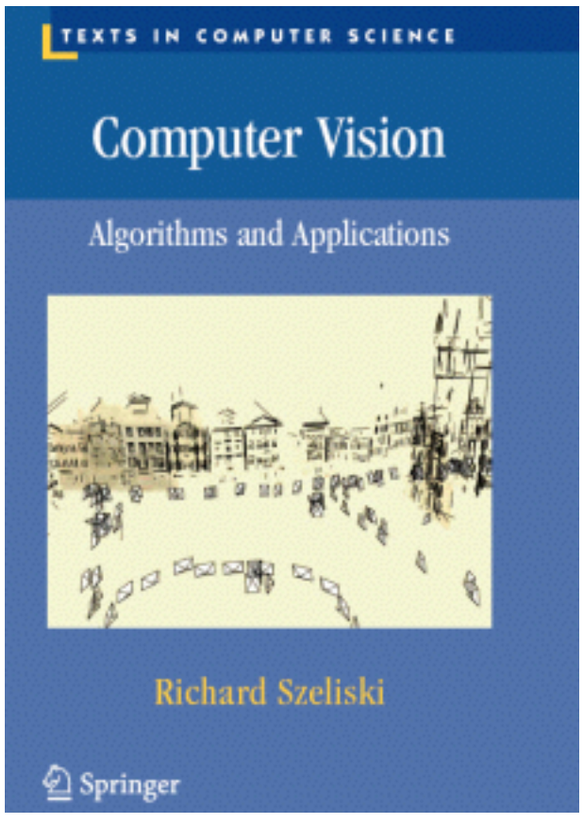




Registration	
Apr 5	Optical Flow (LK, Horn and Shunck)
Apr 10	Image Registration (Additive/Inverse)
Tracking	
Apr 12	State Estimation
Apr 17	Tracking (KLT, Mean-Shift)
Apr 19	NO CLASS
Apr 24	Probability, Temporal State models, HMM
Apr 26	Kalman Filtering, EKF
Special Topics	
May 1	TBA
May 3	TBA

Book

(optional)



PDF online

http://szeliski.org/Book/

No screens
(smartphone, tablet, laptop, etc.)
*unless for taking notes

Waitlist

I will add people in as people drop. Please email me if you have a special situation (e.g., need the class to graduate).

Enjoy the class and master as much as you can!