

# EECS 432 ADVANCED COMPUTER VISION – Spring 2012

Instructor: Ying Wu ([yingwu@eecs.northwestern.edu](mailto:yingwu@eecs.northwestern.edu))  
 Time & Place: Tu/Th 11:00-12:20pm Tech M120  
 Course Web: <http://www.eecs.northwestern.edu/~yingwu/teaching/EECS432>

## “Motion, Geometry and Learning towards Visual Perception”

	Week	Date	Lectures and Discussions	Chapter	Papers	MP
I.	W-1	3/27(Tu)	Introduction	1,2,3		
		3/29(Th)	Camera Model and Calibration	1,2,3	[Zhang00]	
	W-2	4/3(Tu)	Radiometry, BRDF, Shape from Shading	4,5		
		4/5(Th)	Segmentation and Grouping	14,15,16	[Shi98]	
II.	W-3	4/10(Tu)	Optical Flow and Motion Analysis (I)			#1
		4/12(Th)	Optical Flow and Motion Analysis (II)		[Caspi01]	
	W-4	4/17(Tu)	Optical Flow and Motion Analysis (III)			
		4/19(Th)	Visual Tracking (I): basic		[Isard98]	#2
	W-5	4/24(Tu)	Visual Tracking (II): example	17		
		4/26(Th)	Visual Tracking (III): advanced			
W-6	5/1(Tu)	Complex Motion Analysis and Markov Networks				
	5/3(Th)	Stereo (I)	10	[Seitz01]		
W-7	5/8(Tu)	Stereo (II)	11	[Szeliski98]		
	5/10(Th)	Structure From Motion		[Tomasi92]		
W-8	5/15(Tu)	3D Reconstruction & Image-based Rendering			[Seitz96]	
	5/17(Th)	Face Detection				
III.	W-9	5/22(Tu)	Face Recognition (PCA,MDA,ICA)	22	[Turk91]	#3
		5/24(Th)	HMM, Bayesian Networks, Gestures		[Rabiner89]	
	W-10	5/29(Tu)	Project Presentations (I)			
		5/31(Th)	Project Presentations (II)			

[Zhang00]: Z. Zhang, “A Flexible New Technique For Camera Calibration”, IEEE T-PAMI, 2000.

[Zhu98]: S. Zhu, Y. Wu and D. Mumford, “Filters, Random Fields and Maximum Entropy (FRAME): Towards a Unified Theory for Texture Modeling”, IJCV, 1998.

[Shi97]: J. Shi and J. Malik, “Normalized Cuts and Image Segmentation”, CVPR’97.

[Caspi01]: Y. Caspi and M. Irani, “Alignment of Non-Overlapping Sequences”, ICCV’01.

[Isard96]: M. Isard and A. Blake, “Contour tracking by stochastic propagation of conditional density”, ECCV’96.

[Bregler98]: C. Bregler and J. Malik, “Tracking People with Twists and Exponential Maps”, CVPR’98.

[Cootes98]: T. Cootes, G. Edwards, C. Taylor. “Active Appearance Models”, ECCV’98.

[Seitz01]: S. Seitz, “The Shape of all Stereo Images”, ICCV’01.

[Szeliski98]: R. Szeliski and P. Golland. “Stereo matching with transparency and matting”, IJCV’99.

[Tomasi92]: C. Tomasi and T. Kanade, “Shape and Motion From Image Streams Under Orthography – A Factorized Method”, IJCV’92.

[Brand01]: M. Brand, “Morphable 3D Models from Video”, CVPR’01.

[Seitz96]: S. Seitz and C. R. Dyer, “View Morphing”, SIGGRAPH’96.

[Turk91]: M. Turk and A. Pentland, “Face Recognition Using Eigenfaces”, CVPR’91.

[Sung98]: K. Sung, T. Poggio. “Example-Based Learning for View-Based Human Face Detection,” IEEE T-PAMI, 1998.

[Rabiner89]: L. Rabiner, “A Tutorial on Hidden Markov Models and Selected Applications in Speech Recognition”, Proc. IEEE, 1989.