

EECS 433 STATISTICAL PATTERN RECOGNITION – Winter 2017

Instructor: Ying Wu (yingwu@eecs.northwestern.edu)
 Time & Place: Tu/Th 2:00-3:20pm Tech L150
 Course Web: <http://www.eecs.northwestern.edu/~yingwu/teaching/EECS433>

	Week	Date	Lectures and Discussions	Chapter	Readings
I.	W-1	01/03(Tu)	Introduction, Bayesian decision and estimation	1,2,3	[Jain00]
		01/05(Th)	PCA/LDA	3	
	W-2	01/10(Tu)	Independent Component Analysis	4	[Hyvarinen00]
		01/12(Th)	Nearest Neighbor Classification		
	W-3	01/17(Tu)	Nonparametric Density Estimation	4	[Comaniciu02]
		01/19(Th)	Linear Discriminative Models	5	
II.	W-4	01/24(Tu)	Support Vector Machines	5	[Burges98]
		01/26(Th)	Kernel Machines		
	W-5	01/31(Tu)	Feature Extraction and Selection	9	[Freund96][Schapire03]
		02/02(Th)	Advanced Boosting	9	
	W-6	02/07(Tu)	EM and Spectral Clustering	10	[Shi97]
		02/09(Th)	Sparsity Models and Methods		
III.	W-7	02/14(Tu)	Metric Learning	6	[Weinberger06]
		02/16(Th)	Deep Neural Networks		
	W-8	02/21(Tu)	Dimension Reduction and Embedding	2.11	[Tenenbaum00][Roweis00]
		02/23(Th)	Bayesian Networks		
	W-9	02/28(Tu)	Dynamic Bayesian Networks	3.10	[Freeman99]
		03/02(Th)	Markov Random Fields		
	W-11	03/07(Tu)	Project Presentations (I)		
		03/09(Th)	Project Presentations (II)		

- [Jain00]: A. Jain, R. Duin and J. Mao, “Statistical Pattern Recognition: A Review”, *IEEE T-PAMI*, 22:4-37, 2000.
- [Hyvarinen00]: A. Hyvarinen and E. Oja, “Independent Component Analysis: Algorithms and Applications”, *Neural Networks*, 13(4-5):411-430, 2000.
- [Weinberger06]: K. Weinberger, J. Blitzer and L. Saul, “Distance Metric Learning for Large Margin Nearest Neighbor Classification”, *Neural Information Processing Systems*, 2006.
- [Shi97]: J. Shi and J. Malik, “Normalized Cuts and Image Segmentation”, *Proc. IEEE Conf. on Computer Vision and Pattern Recognition*, 1997.
- [Comaniciu02]: D. Comaniciu and P. Meer, “Mean Shift: A Robust Approach Toward Feature Space Analysis”, *IEEE T-PAMI*, 24(5):603-619, 2002.
- [Burges98]: C. Burges, “A Tutorial on Support Vector Machines for Pattern Recognition”, *Data Mining and Knowledge Discovery*, 2:121-167, 1998
- [Tenenbaum00]: J. Tenenbaum, V. de Silva, and J. Langford, “A Global Geometric Framework for Nonlinear Dimensionality Reduction”, *Science*, 290:2319-2323, December 2000.
- [Roweis00]: S. Roweis and L. Saul, “Nonlinear Dimensionality Reduction by Locally Linear Embedding”, *Science*, 290:2323-2326, December, 2000.
- [Steyvers02]: M. Steyvers, “Multidimensional Scaling”, *Encyclopedia of Cognitive Science*, 2002
- [Schapire03]: R. Schapire, “The Boosting Approach to Machine Learning: An Overview”, *Nonlinear Estimation and Classification*, Springer, 2003.
- [Freund96]: Y. Freund and R. Schapire, “Experiments with a New Boosting Algorithm”, *Proc. Int’l Conf. on Machine Learning*, 1996.
- [Freeman99]: W. Freeman and E. Pasztor, “Learning Low-level Vision”, *Proc. IEEE Int’l Conf. on Computer Vision*, 1999.
- [Lafferty01]: J. Lafferty, A. McCallum and F. Pereira, “Conditional Random Fields: Probabilistic Models for Segmenting and Labeling Sequence Data”, *Proc. Int’l Conf. on Machine Learning*, 2001.