**Outline of Lectures**

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| Week 1. | **Fri Jan 23: Introduction**  Course Objectives and Administration ([Slides](http://ranger.uta.edu/%7Ehuang/teaching/CSE6392/CSE6392_Lecture1.pdf)) |
| Week 2. | **Fri Jan 30: Math Basics, Least Square and PCA (**[Slides](http://ranger.uta.edu/%7Ehuang/teaching/CSE6392/CSE6392_Lecture2.pdf)**)**  M. Turk and A. Pentland, "[Face recognition using eigenfaces](http://www.cs.ucsb.edu/%7Emturk/Papers/mturk-CVPR91.pdf)", CVPR 1991.  M. Brand, "[Incremental singular value decomposition of uncertain data with missing values](http://www.merl.com/publications/docs/TR2002-24.pdf)", ECCV 2002.  D. Ross, J. Lim, R. Lin, M. Yang, "[Incremental Learning for Robust Visual Tracking](http://www.cs.toronto.edu/%7Edross/ivt/)", International Journal of Computer Vision, 2007. |
| Week 3. | **Fri Feb 6: Optimization Basics and Gradient Methods** **(**[Slides](http://ranger.uta.edu/%7Ehuang/teaching/CSE6392/CSE6392_Lecture3.pdf)**)**  A. Beck and M. Teboulle, "[A Fast Iterative Shrinkage-Thresholding Algorithm for Linear Inverse Problems](http://iew3.technion.ac.il/%7Ebecka/papers/71654.pdf)", SIAM Journal on Imaging Sciences, No. 1, pp. 183-202, 2009.  A. Beck and M. Teboulle, "[Fast Gradient-Based Algorithms for Constrained Total Variation Image Denoising and Deblurring Problems](http://iew3.technion.ac.il/%7Ebecka/papers/new-vers6.pdf)", IEEE Trans. Image Processing, Vol. 18, No. 11, pp. 2419-2434, 2009  Yurii Nesterov, "[Gradient Methods for Minimizing Composite Objective Function](http://www.ecore.be/DPs/dp_1191313936.pdf)", 2007. |
| Week 4. | **Fri Feb 13: Concentration Inequality**  N.P. Slagle, "[One Hundred Probability/Statistics Inequalities](http://npslagle.info/articles/onehundredprobabilityinequalities.pdf)", 2012.  K. Sridharan, "[A Gentle Introduction to Concentration Inequalities](http://ttic.uchicago.edu/%7Ekarthik/concentration.pdf)", 2009  S. Boucheron, G. Lugosi, P. Massart, "[Concentration Inequalities: A Nonasymptotic Theory of Independence](http://www.amazon.com/Concentration-Inequalities-Nonasymptotic-Theory-Independence/dp/0199535256)", 2013. |
| Week 5. | **Fri Feb 20: Scalable Searching Via Hiearchical Kmean Tree (**[Slides](http://ranger.uta.edu/%7Ehuang/teaching/CSE6392/CSE6392_Lecture5.pdf)**)**  D. Lowe, "[Object recognition from local scale-invariant features](http://www.cs.ubc.ca/%7Elowe/papers/iccv99.pdf)", ICCV 1999.  D. Nist́er and H. Steẃenius, "[Scalable Recognition with a Vocabulary Tre](http://www.vis.uky.edu/%7Estewe/publications/nister_stewenius_cvpr2006.pdf)e", CVPR 2006. |
| Week 6. | **Fri Feb 27:** Campus is closed due to the snow storm |
| Week 7. | **Fri Mar 6:**  Online Learning for Group Lasso, Haiqin Yang , Zenglin Xu , Irwin King , Michael R. Lyu, ICML 2010 (Di Ming)  A Safe Screening Rule for Sparse Logistic Regression. Jie Wang, Jiayu Zhou, Jun Liu, Peter Wonka, and Jieping Ye. NIPS 2014. (Rasool) |
| Week 8. | **Fri Mar 13: Spring Break** |
| Week 9. | **Fri Mar 20:**  Introduction of online convex optimization (Zhongxing Peng)  A Dynamic Screening Principle for the Lasso, A. Bonnefoy, V. Emiya, L. Ralaibola, R. Gribonval, EUSIPCO 2014. (Shuai Zheng) |
| Week 10. | **Fri Mar 27:**  Communication Efficient Distributed Optimization using an Approximate Newton-type Method (Zheng Xu)  Median Selection Subset Aggregation for Parallel Inference, .X Wang, P. Peng, D. Dunson, NIPS 2014 (Jiawen Yao) |
| Week 11. | **Fri Apr 3:**  Hogwild: A Lock-Free Approach to Parallelizing Stochastic Gradient Descent ( Ruoyu Li)  Accelerated, Parallel and PROXimal coordinate descent, O. Fercoq and P. Richtárik, December 2013 (Kamran Ghasedi Dizaji) |
| Week 12. | **Fri Apr 10:**  Dynamic Screening: Accelerating First-Order Algorithms for the Lasso and Group-Lasso, A. Bonnefoy, V. Emiya, L. Ralaivola, R. Gribonval. 2014. (Shuai Zheng)  Innovated interaction screening for high-dimensional nonlinear classification. Fan, Y., Kong, Y., Li, D. and Zheng, Z. (2014). The Annals of Statistics (Rasool). |
| Week 13. | **Fri Apr 17:**  Online Learning and Online Convex Optimization. Shai Shalev-Shwartz.Foundations and Trends in Machine Learning (Zhongxing Peng)  Adaptive Subgradient Methods for Online Learning and Stochastic Optimization. JMLR 2011 (Di Ming) |
| Week 14. | **Fri Apr 24:**  Z. Peng, M. Yan, and W. Yin. Parallel and Distributed Sparse Optimization, Asilomar’13, 2013 (Ruoyu Li)  Parallel Direction Method of Multipliers, H. Wang and A. Banerjee and Zhi-Quan Luo, NIPS 2014 (Kamran Ghasedi Dizaji) |
| Week 15. | **Fri May 1:**  Distributed Basis Pursuit, J. Mota, J. Xavier, P. Aguiar and M. Püschel, 2012 (Jiawen Yao)  Distributed block coordinate descent for minimizing partially separable functions, J. Mareček, P. Richtárik and M. Takáč, to appear in Recent Developments in Numerical Analysis and Optimization, Springer Proceedings in Mathematics and Statistics, 2015 (Zheng Xu) |
| Week 16. | **Fri May 8: Final Project Presentations** |