

Seminar in Statistics: High-Dimensional Statistics

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February 17, 2015

Mo, 3pm-5pm, HG G 26.5

Questions: number -4 modulo 12, e.g. group 6 asks questions to group 2.

Feedback: number $+4$ modulo 12, e.g. group 11 asks questions to group 3.

-1. **Introduction** (16.02., N. Meinshausen)

0. **Lasso and least angle regression** (23.02., D. Rothenhäusler)

José Luis, Christophe-Aschkan Mery-Khosrowshahi

Tibshirani, Robert. "Regression shrinkage and selection via the lasso." Journal of the Royal Statistical Society. Series B (Methodological) (1996): 267-288.

<http://www.jstor.org/stable/2346178>

Efron, Bradley, et al. "Least angle regression." The Annals of statistics 32.2 (2004): 407-499.

http://projecteuclid.org/download/pdfview_1/euclid.aos/1083178935

See also Section 2.12 of Bühlmann, Peter, and Sara Van De Geer. Statistics for high-dimensional data: methods, theory and applications. Springer Science & Business Media, 2011.

<http://link.springer.com/book/10.1007%2F978-3-642-20192-9>

1. **Pathwise coordinate optimization** (02.03., J. Jankova)

Zhiying Cui, Lukas Steffen

Friedman, Jerome, et al. "Pathwise coordinate optimization." The Annals of Applied Statistics 1.2 (2007): 302-332.

http://projecteuclid.org/download/pdfview_1/euclid.aos/1196438020

2. **Model selection with grouped variables** (09.03., D. Rothenhäusler)

Zhu Zhiyuan, Song Hanyu

Yuan, Ming, and Yi Lin. "Model selection and estimation in regression with grouped variables." Journal of the Royal Statistical Society: Series B (Statistical Methodology) 68.1 (2006): 49-67.

<http://www.jstor.org/stable/3647556>

See also Section 4 of Bühlmann, Peter, and Sara Van De Geer. Statistics for high-dimensional data: methods, theory and applications. Springer Science & Business Media, 2011.

<http://link.springer.com/book/10.1007%2F978-3-642-20192-9>

3. **Sparse inverse covariance estimation** (16.03., J. Jankova)
 Manuel Moser, Damian Tschirky
 Friedman, Jerome, Trevor Hastie, and Robert Tibshirani. "Sparse inverse covariance estimation with the graphical lasso." *Biostatistics* 9.3 (2008): 432-441.
<http://biostatistics.oxfordjournals.org/content/9/3/432.full.pdf+html>
 See also Section 13.4.1 of Bühlmann, Peter, and Sara Van De Geer. *Statistics for high-dimensional data: methods, theory and applications*. Springer Science & Business Media, 2011.
<http://link.springer.com/book/10.1007%2F978-3-642-20192-9>
4. **Square-root lasso** (23.03., D. Rothenhäusler)
 Roberto Skory, Laura Gulfi
 Belloni, Alexandre, Victor Chernozhukov, and Lie Wang. "Square-root lasso: pivotal recovery of sparse signals via conic programming." *Biometrika* 98.4 (2011): 791-806.
<http://arxiv.org/pdf/1009.5689>
5. **Dantzig selector** (30.03., J. Jankova)
 Pawel Morzywolek, Jakob Dambon
 Candes, Emmanuel, and Terence Tao. "The Dantzig selector: statistical estimation when p is much larger than n." *The Annals of Statistics* (2007): 2313-2351.
<http://www.jstor.org/stable/25464587>
6. **Theory for the lasso** (20.04., J. Jankova)
 Sonja Meier, Nina Aerni
 Section 6.2.2 of Bühlmann, Peter, and Sara Van De Geer. *Statistics for high-dimensional data: methods, theory and applications*. Springer Science & Business Media, 2011.
<http://link.springer.com/book/10.1007%2F978-3-642-20192-9>
7. **Adaptive lasso** (20.04., D. Rothenhäusler)
 Anastasia Gavrilova, Shunsuke Kajimura
 Zou, Hui. "The adaptive lasso and its oracle properties." *Journal of the American statistical association* 101.476 (2006): 1418-1429.
<http://www.tandfonline.com/doi/pdf/10.1198/016214506000000735>
 See also Section 2.8 of Bühlmann, Peter, and Sara Van De Geer. *Statistics for high-dimensional data: methods, theory and applications*. Springer Science & Business Media, 2011.
<http://link.springer.com/book/10.1007%2F978-3-642-20192-9>
8. **Confidence intervals for high-dimensional models** (04.05., J. Jankova)
 Elias Bolzern, Tobias Hatt
 Zhang, Cun-Hui, and Stephanie S. Zhang. "Confidence intervals for low dimensional parameters in high dimensional linear models." *Journal of the Royal Statistical Society: Series B (Statistical Methodology)* 76.1 (2014): 217-242.

<http://onlinelibrary.wiley.com/doi/10.1111/rssb.12026/pdf>

9. **Compressed sensing** (04.05., J. Jankova)

Yoann Trelu, Solt Kovács

Candès, Emmanuel J. "Compressive sampling." Proceedings of the International Congress of Mathematicians: Madrid, August 22-30, 2006: invited lectures. 2006.

<http://signallake.com/innovation/CompressiveSampling06.pdf>

10. **Image analysis** (11.05., D. Rothenhäusler)

Manuel Schürch, Patrick Hnilicka

Mairal, Julien, Francis Bach, and Jean Ponce. "Sparse Modeling for Image and Vision Processing." arXiv:1411.3230 (2014). <http://arxiv.org/pdf/1411.3230>

11. **Correlated topic model of science** (18.05., D. Rothenhäusler)

Mathias Mauchle, Lukas Schiesser

Blei, David M., and John D. Lafferty. "A correlated topic model of science." The Annals of Applied Statistics (2007): 17-35.

http://projecteuclid.org/download/pdfview_1/euclid.aas/1183143727