High-dimensional Statistics

S2F2 Hauptseminar Stochastische Prozesse, S4F1 Graduate Seminar Probability Theory (WS 2020/21, Fridays 14 c.t.)

		Thema	*Name*	*E-Mail*	*Datum*
		2. Basic tail and concentration bounds			
	2.1	Classical sub-Gaussian and sub-exponential bounds			30.10.
	2.2.,2.3	Martingale based methods, Lipschitz functions			
		3. Concentration of measure			
	3.1, 3.4	Entropy and concentration, empirical processes			
	3.2	Geometric perspective			
	3.3	Wasserstein distances and information			
		4. Uniform laws of large numbers			
	4.1-4.3	Rademacher complexity & uniform laws			
		5. Metric entropy			
	5.1-5.3	Metric entropy and sub-Gaussian processes			
	5.4-5.6	Gaussian comparison, chaining			
		6. Covariance estimation			
	6.1-6.3	Sub Gaussian ensembles			
	6.4-6.5	General matrices			
		7. Sparse linear models in high dimensions			
	7.1-7.2	Noiseless setting			
	7.3-7.5	Noisy setting			
		8. Principle component analysis			
	8.1-8.3	PCA and sparse PCA			
		15. Minimax lower bounds			
	15.1-15.2	Binary testing			
	15.3	Fano‘s method			12.2.

Wainwright: High-dimensional statistics

Vershynin: High-Dimensional Probability • An Introduction with Applications in Data Science

Rigollet: High dimensional statistics

Blum et al: Foundations of data science

S2F2 Hauptseminar Stochastische Prozesse
S4F1 Graduate Seminar on Probability Theory

High-dimensional Statistics

Andreas Eberle Fridays 14-16, WS 2020/21

This seminar will mainly follow the book "High-Dimensional Statistics" by M.J. Wainwright, see

https://people.eecs.berkeley.edu/~wainwrig/BibPapers/Wai19.pdf

There will be both more basic and more advanced topics available, so that the seminar is suitable both for third year Bachelor and for Master students. The seminar requires only a background in measure-theoretic probability. A prior knowledge of statistics is not necessary.

An additional reference covering many but not all of the topics is the book "High-Dimensional Probability: An introduction with applications to data science" by R. Vershynin that is available online at

https://www.math.uci.edu/~rvershyn/papers/HDP-book/HDP-book.pdf

Preliminary meeting: Friday 10.7., 14.15 via Zoom

Meeting-ID: 338 100 971
Passwort: 011273