S4F3 Graduate Seminar Applied Probability: MC methods & Machine Learning (Sommersemester 2019/20)
Wednesdays 10 c.t., Online via Zoom/Seminarraum 0.006, Endenicher Allee 60

		Thema	*Name*	*Datum*	*Literatur*
		A. Introduction			
	A1.	Deep learning for Applied Mathematicians		22.4.	Higham & Higham
		B. Foundations			**Shalev-Shwartz, Part I**
	B1.	Bias-Complexity Tradeoff		29.4.	5
	B2.	VC Dimension		6.5.	6, Anthony-Bartlett
		C. From Theory to Algorithms			**Shalev-Shwartz, Part II**
	C1.	Linear Predictors		13.5.	9
	C2.	Boosting		20.5.	10
	C3.	Convex learning problems		3.6.	12
	C4.	Regularization and stability		10.6.	13
	C5.	Stochastic Gradient Descent		17.6.	14
	C7.	Support vector machines, kernel methods		24.6.	15, 16
	C8.	Nearest neighbour		1.7.	19
	C9.	Neural networks		8.7.	20
		D. Mean-field particle systems and neural networks			
	D1.	Breaking the curse of dimension with convex NN		Freitag 26.6.	Bach
	D2.	Mean field analysis of NN		Freitag 26.6.	Sirignano, Siliopoulos
	D3.	Trainability and accuracy of NN: An IPS approach I		Freitag 3.7.	Rotskoff, vanden Eijnden
	D4.	Trainability and accuracy of NN: An IPS approach II		Freitag 3.7.	Rotskoff, vanden Eijnden

Higham & Higham: Deep learning: An introduction for applied mathematicians

Shalev-Shwartz, Ben-David: Understanding Machine Learning

Bubeck: Theory of convex optimization for Machine Learning

Goodfellow, Bengio, Courville: Deep Learning Nielsen: Neural networks and deep learning