

# Machine Learning 2020

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# Place and Time

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- Tue, 10.15-12.00 Spiegelgasse 1, Seminarraum 00.003  
Wed, 14.15-16.00 Alte Universität, Seminarraum -201.
- Exercises: Wed, 16.15-18.00 Spiegelgasse 5, Seminarraum 05.001.

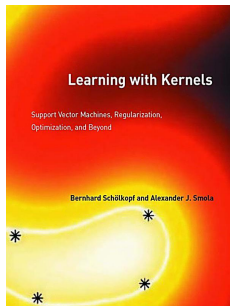
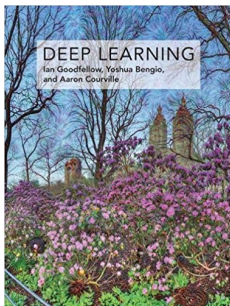
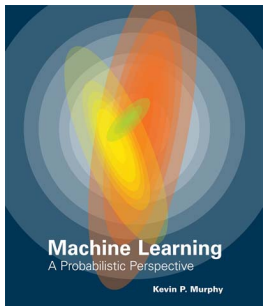
## How do I get my credits??

- 70% of the problem sets (exercises) “edited in a meaningful way”
- oral exam

# Overview

- Probability
- Supervised Learning
  - ▶ Generative models for discrete data
  - ▶ Classification: classical linear methods & extensions
  - ▶ Regression estimation: classical linear methods, regularization, sparsity & feature selection
  - ▶ Bayesian model selection
  - ▶ Neural networks & deep learning, interpretability of deep architectures
  - ▶ Elements of statistical learning theory
  - ▶ Support Vector Machines and kernel methods
  - ▶ Probabilistic kernel models: Gaussian Processes
- Unsupervised Learning
  - ▶ Mixture models, mixtures of experts
  - ▶ Linear latent models (FA, PCA, CCA)
  - ▶ Nonlinear latent models (VAE, IB)

# Textbooks



- Kevin P. Murphy: Machine Learning. A Probabilistic Perspective. MIT Press, 2012.
- Ian Goodfellow, Yoshua Bengio and Aaron Courville: Deep Learning. MIT Press, 2016.
- Bernhard Schölkopf and Alexander J. Smola: Learning with Kernels. Support Vector Machines, Regularization, Optimization, and Beyond.