

Foundations of Machine Learning

Course overview

Learning objectives:

- Build predictive models from training data
- Correctly evaluate predictive models
- Analyze and compare the performance of different models
- Reason about the mathematical foundations of data mining techniques
- Recognize when a predictive model is under/overfitting
- Understand and exploit the bias-variance tradeoff
- Combine the above with dimension-reduction techniques
- Visualize and explore data using embeddings and clustering

Lecturers:

- Joaquin Vanschoren (j.vanschoren@tue.nl) MF 7.104a
- Vlado Menkovski (v.menkovski@tue.nl) MF 7.097b
- Anne Driemel (a.driemel@tue.nl) MF 7.073

Contact hours:

- Mondays, 10:45 - 12:30: Plenary Lectures (AUD 3)
- Thursdays, 13:45 - 15:30: Tutorials and Feedback (AUD 3)
- Thursdays, 15:45 - 17:30: Plenary Lectures (Flux 1.03)

Course materials:

- Lecture materials (Notebooks+PDFs) on GitHub
 - <https://github.com/joaquinvanschoren/ML-course>
 - The README contains pointers to relevant books
- See Canvas for:
 - Syllabus
 - Announcements, discussions
 - Assignments, grades

Evaluation:

- No exam, only assignments (4 problem sets)
- Preliminary(!) overview:
 - 1: Linear Models, Model selection, Ensembles
 - * Released Feb 9 , Deadline Feb 23
 - 2: Kernel method and Bayesian Inference
 - * Released Feb 23, Deadline Mar 16
 - 3: Deep learning
 - * Released Mar 16, Deadline Mar 30
 - 4: Dimensionality reduction, Embeddings
 - * Released Mar 30, Deadline Apr 13

- Work in teams of 2 students
 - Free choice, rotated after Assignment 2
- Passing grade: 6/10 over all assignments