

Uncertainty Quantification and Statistical Learning

February 8, 2023

Research Center Trustworthy Data Science and Security (UA Ruhr)
Department of Statistics (TU Dortmund)

<https://rc-trust.ai/klein/>



CENTER FOR TRUSTWORTHY
DATA SCIENCE AND SECURITY
RESEARCH ALLIANCE

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Selected Topics in Data Science

The preliminary syllabus:

- Learning theory.
- Ensembling (bagging, boosting, etc.)
- Resampling (bootstrapping, generalisation error estimation, etc.)
- Bayesian methods (GPs, Variational inference).
- Something you are interested in?

Basic info:

- An elective course for master programs in statistics and data science.
- Pre-requisites: Advanced statistical learning, statistical theory, etc.
- The course is offered for the first time, so some topics might change.

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Selected Topics in Data Science

Schedule:

- Lectures on Thursdays from 14:15-15:45 in room: CDI/ZHB 120.
- Exercise+Tutorium session on Tuesdays from 10:15 - 11:45 in room: TBA.
- Final written exam at the end of the semester. Dates: TBA.
- Requirements for the exam will be announced in the first lecture.

Advanced Bayesian Data Analysis

Basic info:

- Aim: Deepen the practical and theoretical foundations of Bayesian statistics and understand recent developments in Bayesian Computation.
- Target audience: Master students in the Statistics or Data Science program.

The preliminary syllabus:

- Recaps in Bayes' Theorem, conjugate prior distributions, posterior inference in general.
- Bayesian regression models (linear, logistic, nonparametric).
- MCMC Inference (Metropolis-Hastings, Gibbs) and MCMC diagnostics.
- Bayesian high-dimensional regression (horseshoe).
- Approximate inference (Variational inference, ABC).

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Advanced Bayesian Data Analysis

- Lectures every two weeks on Thursdays from 10:15-13:45 in room: ME 25.
- Exercise+Tutorium class every two weeks on Thursdays from 10:15-13:45.
- Final written exam at the end of the semester. Dates TBA.
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