

## Tutorial: Statistical Learning (Part 1)

*Monday 18 September 2023 11:15 (1 hour)*

The course package covers foundations and recent advances of machine learning techniques, including:

- Basic concepts: Linear regression, nearest neighbour, parametric vs. non-parametric methods, Bayesian classifiers, the curse of dimensionality, model accuracy, bias-variance trade-off
- Linear classifiers: linear regression for classification (discriminative model), linear discriminant analysis (generative model)
- Nonlinear classifiers with Ensemble learning: Decision trees, random forests, boosting
- Unsupervised learning: Gaussian mixture models, k-means

Our course aims to provide participants with not only a theoretical foundation, but also the practical skills needed to use and develop effective machine learning solutions to a wide variety of problems. We illustrate the use of the models in the tutorial throughout the course with methods implemented in Python.

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**Session Classification:** Course Package 12 (Helmholtz AI)