

Trainer



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Stefan T. Radev received the M.Sc. degree in psychology and the B.Sc. degree in computer science from Heidelberg University. He completed a Ph.D. degree in the research training group Statistical Modeling in Psychology. His research focuses on the convergence of Bayesian analysis, deep learning, and mathematical models of cognition at the intersection between cognitive science and artificial intelligence. He is currently a PostDoc in the STRUCTURES Cluster of Excellence, where he is working on deep learning methods for simulation science.

An Introduction to Bayesian Inference

Objective

The workshop aims to introduce participants to the fundamental concepts and techniques of Bayesian statistics and probability theory as the logic of science. Further, it aims to familiarize participants with the vast landscape of Bayesian concepts and enable them to write their first probabilistic programs.

Description

The workshop will start with a self-contained overview of probability theory and the basic concepts behind Bayesian analysis. It will then cover the key differences between Bayesian and non-Bayesian methods, with a focus on the relative merits of both approaches.

Participants will learn when to use Bayesian methods to perform uncertainty quantification and how to interpret the results of probabilistic inference. As the workshop progresses, we will dive into more advanced topics, such as parameter estimation and model comparison. Hands-on exercises using the popular R programming language will be included to help participants gain practical experience with the concepts covered.

Finally, we will briefly discuss some more advanced topics for further study, such as approximate Bayesian computation (ABC).

By the end of the workshop, participants will have a solid understanding of Bayesian analysis, which will serve as the starting point for applying Bayesian methods to their own research.

Methodology

Along simple mathematical tools, we will use the R programming language, leveraging the powerful *brms* software as an interface for creating probabilistic programs and doing modern Bayesian analysis.

Conditions

Participants should have some prior experience with quantitative data analysis and bring an eagerness to learn new concepts and ideas.

Prior exposure to R will be a plus, but is not a requirement.

Organizational Information

Language / Format	English / On campus
Target group	Doctoral Candidates at all stages and Postdocs from all faculties
Date	Thursday-Friday, 25-26 May 2023, 10:00 – 17:00
Registration	For registration click here