

A cordial invitation to the opening talk of the  
Brown Bag Seminar  
*Recent Developments in Data Science:*

## **Fast and Fair Simultaneous Confidence Bands for Functional Parameters**

By  
Prof. Dr. Dominik Liebl

Date: 25.10.2021 (Monday) at 10:30

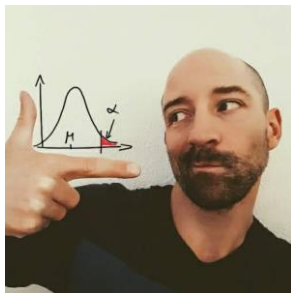
Location: R 301 WIWI

Link and further  
information: Course 39740 Seminar: Doctoral Seminar "Recent  
Developments in Data Science" in Stud.IP

## Abstract:

Quantifying uncertainty using confidence regions is a central goal of statistical inference. Despite this, methodologies for confidence bands in Functional Data Analysis are underdeveloped compared to estimation and hypothesis testing. This work represents a major leap forward in this area by presenting a new methodology for constructing simultaneous confidence bands for functional parameter estimates. These bands possess a number of striking qualities: (1) they have a nearly closed-form expression, (2) they give nearly exact coverage, (3) they have a finite sample correction, (4) they do not require an estimate of the full covariance of the parameter estimate, and (5) they can be constructed adaptively according to a desired criteria. One option for choosing bands we find especially interesting is the concept of fair bands which allows us to do fair (or equitable) inference over subintervals and could be especially useful in longitudinal studies over long time scales. Our bands are constructed by integrating and extending tools from Random Field Theory, an area that has yet to overlap with Functional Data Analysis.

## Speaker:



Prof. Dr. Dominik Liebl

Dominik Liebl is Professor of Statistics at the University of Bonn. His research interests focus on functional data analysis, semi- and nonparametric statistics, longitudinal data analysis, mathematical and computational statistics. He pursues an application-oriented research approach focusing on actual real data problems that are both statistically interesting and practically relevant.

Starting points of his past and current research are data challenges, for instance, in empirical economics, energy economics, finance, e-commerce (e.g., Google AdWords data), and psychology. He is committed to providing the computational implementations of my statistical research and publish R-packages at CRAN and GitHub accompanying his research papers.