

A cordial invitation to a presentation in the
Brown Bag Seminar
Recent Developments in Data Science:

Leveraging Background Knowledge for Understanding and Modeling Complex Systems

By
Jun.-Prof. Dr. Martin Becker

Date: 26.01.2023 (Thursday) at 12:30

Location: R 301 WIWI

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

Abstract:

The application of machine learning and in particular deep learning is rapidly spreading across disciplines and into novel application scenarios. However, the corresponding models are often predictive, black-box models from which it is not straightforward to gain deeper insights into the underlying processes of the domain. Nevertheless, such insights and the corresponding gain in knowledge are key for intervention conception, hypothesis generation, or policy design in domains like medicine, environmental science, or human behavior studies. At the same time, the applied models mostly ignore existing domain knowledge and thus have to rely on massive amounts of data to enable end-to-end machine learning approaches. In this talk, I give an overview of methods that work towards jointly addressing these challenges by developing a holistic framework for deriving comprehensible and actionable insights into complex systems in order to leverage background knowledge and auxiliary information to enable and enhance end-to-end machine learning models.

Speaker: Jun.-Prof. Dr. Martin Becker



Martin Becker is a junior professor of data science and machine learning at the University of Rostock and leads the Chair of Intelligent Data Analytics. He was formerly a postdoctoral fellow at the University of Stanford at the Aghaeepour Lab for "Artificial Intelligence and Machine Learning for Translational Biology and Medicine". He received his Ph.D. in machine learning on "Understanding Human Navigation using Bayesian Hypothesis Comparison" in 2018, and his diploma in computer science on "Constraint-Based Descriptive Pattern Mining" in 2011, both at the University of Würzburg.

His research focus is on data science and knowledge-based machine learning with a recent emphasis on biomedical systems including single-cell analysis and multiomics integration. His main interest lies in gaining, formalizing, and integrating existing knowledge from and into machine learning models in an effective manner. For this, he has recently acquired funding for a BMBF AI Research Group.

He has also conducted extensive research and published works in the areas of environmental studies and citizen science, explaining human navigation behavior, to research in the areas of web sciences, digital humanities, computational linguistics, and sports science. His work has been published in journals such as Nature Machine Intelligence, Science Translational Medicine, or the Data Mining and Knowledge Discovery Journal, as well as in the context of conferences like the SigKDD (Knowledge Discovery and Data Mining), the Web Conference (WWW), or the ECML/PKDD.