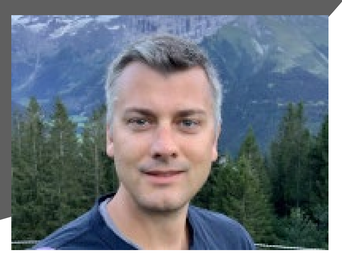
University of Stuttgart

Stuttgart Research Center Systems Biology (SRCSB)

Systems Biology Seminar Talk

„Machine Learning with Discrete Structures and Algorithms “

Prof. Dr. Mathias Niepert
SimTech, University of Stuttgart



Wednesday
July 13, 2022
10 a.m. – 11 a.m.

Lecture Hall 0.106
Allmandring 31
Stuttgart

Abstract:

Machine learning at scale has led to impressive results ranging from text-based image generation, reasoning with natural language, and code synthesis to name just a few of the most recent applications. The machine learning approaches driving these methods are also successfully applied to a broad range of problems including those in the biomedical sciences. Due to their impressive results, these developments make some of us question the need for incorporating prior knowledge in form of symbolic (discrete) structures and algorithms. My group’s research is concerned with the development of machine learning methods that use discrete structures such as graphs. We also address the problem of learning and leveraging structure from data where it is missing, combining discrete algorithms and probabilistic models with continuous gradient-based learning. Especially machine learning models with the aim to exhibit some form of explanatory properties have to rely on symbolic representations. The talk will also cover some biomedical applications and future research directions.

CV:

Mathias is a full professor (W3) at the University of Stuttgart and a faculty member of the International Max Planck Research School for Intelligent Systems (IMPRS-IS). He heads the Machine Learning and Simulation Science Lab. His professorship is part of the Cluster of Excellence for the Simulation Sciences (SimTech) and the Department of Computer Science. He is also a Chief Scientific Advisor at NEC Laboratories Europe. At NEC Labs Europe he was senior (2015-2017) and chief research scientist (2017-2021) as well as manager (2019-2021) of the machine learning group. From 2013-2015 he was a postdoctoral research associate at the Allen School of Computer Science, University of Washington. His group's research interests include representation learning for graph-structured data, geometric deep learning, probabilistic graphical models, and the intersection of ML and the simulation sciences. Mathias is also co-founder of several open-source digital humanities projects such as the Indiana Philosophy Ontology Project.

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