PARIS LODRON UNIVERSITÄT SALZBURG

Department of Computer Science
July 15, 2025, at 11:00 a.m.

Beyond Bottlenecks: Towards Scalable Decentralized Machine Learning

The Department of Computer Science
University of Salzburg

invites to **the talk**
by
Assoc. Prof. Kfir Y. Levy

on Tuesday, July 15, 2025, at 11:00 a.m.

in the Lecture Hall T01,
Jakob-Haringer-Straße 2,
(JAK2 1st floor, room 01)

Host: Univ.-Prof. Sebastian Forster

COLLOQUIA ON ALGORITHMS AND LEARNING

Beyond Bottlenecks: Towards Scalable Decentralized Machine Learning

Modern large-scale learning increasingly relies on decentralized systems to scale computation, eliminate central points of failure, and enable training in communication-constrained or privacy-sensitive environments. Yet, despite their promise, decentralized learning algorithms face fundamental scalability limitations due to delayed consensus and model divergence.
In this talk, I will describe a recent line of work addressing these limitations through a new algorithm called DAT-SGD (Decentralized Anytime SGD**)**, which improves parallelism bounds. In particular, I will explain how a recent technique called *anytime gradient methods* can mitigate the synchronization bottleneck that plagues standard decentralized SGD, and how these allow us to approach the performance of centralized training even over sparse network topologies.
My goal is not only to present recent progress, but also to open up a conversation on the algorithmic and systems-level challenges that arise when bridging these two domains—and to identify exciting opportunities for collaboration.

About Assoc. Prof. Kfir Y. Levy:
Kfir Y. Levy is an Associate Professor in the Electrical and Computer Engineering Department at Technion – Israel Institute of Technology. Kfir's research is focused on Machine Learning, AI, and Optimization, with a special interest in designing universal methods that apply to a wide class of learning scenarios. Kfir did his postdoc in the Institute for Machine Learning at ETH Zurich. He is a recipient of the Alon fellowship, the ETH Zurich Postdoctoral fellowship, as well as the Irwin and Joan Jacobs fellowship. He received all of his degrees from the Technion.