



Seminar Hora Informaticae

Institute of Computer Science, Prague

Tuesday, April 14, 2026, 13.30 – 15.30 (1.30 – 3:30 PM) CEST

Meeting Room 318, Address: Pod Vodárenskou věží 2, Prague 8

Meeting ID: 914 0834 4018, Passcode: 668534



<https://cesnet.zoom.us/j/91408344018?pwd=x2QIz4F42BxlMSmWc1HOwHHA7Uw7PN.1>

Lenka Zdeborová (École Polytechnique Fédérale de Lausanne, Swiss).

Generalization in Attention-Based Neural Networks: Solvable High-Dimensional Models.

Understanding generalization in neural networks has been a central question since the early days of learning theory. A productive line of work studies simplified models in high-dimensional limits, where analytical predictions for learning curves, generalization error, and algorithmic performance can be obtained.

In this talk, I will review several results in this direction, including classical models of supervised learning and more recent extensions that allow one to analyze modern architectures operating on sequences of inputs. These solvable models provide closed-form descriptions of generalization performance and reveal how it depends on the structure of the data, the architecture of the network, and the learning algorithm. While necessarily simplified, such models offer a tractable framework for studying the principles governing learning in high-dimensional neural networks.

Lenka Zdeborová (<https://people.epfl.ch/lenka.zdeborova/?lang=en>) is a Professor of Physics and Computer Science at École Polytechnique Fédérale de Lausanne, where she leads the Statistical Physics of Computation Laboratory. She received a PhD in physics from the University of Paris-Sud and Charles University in Prague in 2008. She spent two years in the Los Alamos National Laboratory as the Director's Postdoctoral Fellow. Between 2010 and 2020, she was a researcher at CNRS, working in the Institute of Theoretical Physics in CEA Saclay, France. In 2014, she was awarded the CNRS bronze medal, in 2016 Philippe Meyer prize in theoretical physics and an ERC Starting Grant, in 2018 the Irène Joliot-Curie prize, in 2021 the Gibbs lectureship of AMS and the Neuron Fund award, in 2025 she received an ERC Advanced Grant. Lenka's expertise is in the application of concepts from statistical physics, such as advanced mean field methods, the replica method, and related message-passing algorithms, to problems in machine learning, signal processing, inference, and optimization. Currently, she focuses on statistical physics of learning, developing solvable models and theoretical principles that explain how modern AI systems generalize, memorize, and scale. She enjoys erasing the boundaries between theoretical physics, mathematics and computer science.

HORA INFORMATICAЕ (meaning: TIME FOR INFORMATICS) is a broad-spectrum scientific seminar devoted to all core areas of computer science and its interdisciplinary interfaces with other sciences and applied domains. Original contributions addressing classical and emerging topics are welcome. Founded by Jiří Wiedermann, the seminar is running since 1994 at the Institute of Computer Science of the Czech Academy of Sciences in Prague.

<https://www.cs.cas.cz/horainf>