Lecture series

by

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on

Statistical Learning of Neural Networks

August 21 and August 23, 2023
10.15 am - 12.00 pm

Location: Audimax, 1st floor, Math. Institute, Bunsenstrasse 5-7
Host: Prof. Dr. Axel Munk

Lecture 1: Towards a statistical foundation for deep neural networks
(Mon, August 21, 10.15 am – 12.00 pm, MI Audimax)

Recently a lot of progress has been made regarding the theoretical understanding for deep artificial neural networks. One of the very promising directions is the statistical approach, which interprets deep learning as a statistical method and builds on existing techniques in mathematical statistics to derive theoretical error bounds and to understand phenomena such as overparametrization. The lecture surveys this field and describes future challenges.

Lecture 2: Statistical learning in biological neural networks
(Wed, August 23, 10.15 am - 12.00 pm, MI AudiMax)

Compared to artificial neural networks (ANNs), the brain learns faster, generalizes better to new situations and consumes much less energy. ANNs are motivated by the functioning of the brain but differ in several crucial aspects. In particular, it is biologically implausible that the learning of the brain is based on gradient descent. In this talk we look at the brain as a statistical method for supervised learning. The main contribution is to relate the local updating rule of the connection parameters in biological neural networks (BNNs) to a zero-order optimization method. The lecture is based on arxiv:2301.11777.

Registration: Please register via E-Mail to crc1456@uni-goettingen.de until 14.08.2023.