PRINCETON CENTER FOR THEORETICAL SCIENCE

Physics for Neural Networks

April 17-19, 2023

Room 407 Jadwin Hall, PCTS

Organizers
William Bialek; Giorgio Cipolloni; Boris Hanin; Francesca Mignacco

A hallmark of modem machine learning, exemplified by deep learning, is the use of exceptionally large models to fit complex datasets. While the empirical success of the neural network models used in deep learning is undeniable, a predictive formalism for describing and improving them is nascent. On the theoretical side a promising avenue for making progress is to view neural networks as large collections of (often weakly) interacting parameters. From this perspective, it is natural to study them using the tools of modern physics coming from random matrix theory, statistical mechanics, the 1/n expansion, field theory, and so on. On the experimental side, neural networks present a unique opportunity for impactful empirical investigation in which the microscopic ground truth is known to arbitrary precision. The purpose of this workshop is to bring together a range of scientists trained in a variety of disciplines related to modern physics that are interested in developing both the theory and phenomenology of deep learning.

Free but required registration is now open on the PCTS website or scan the QR code.

https://forms.gle/EZ4A7n8MrBDFoJex6

Speakers

Ben-Adlam
Yasaman-Bahri
Lucas-Benigni
Sebastian-Goldt
Guy-Gur-Ari
Jiaoyang-Huang
Julia-Kempe
Florent-Krzakala
Andrea-Montanari
Cengiz-Pehlvan
Zohar-Ringel
Dan-Roberts
Sho-Yaida
Lenka-Zdeborova