



Physics Seminar Series, IIT Hyderabad

Online webinar on **Aug 25, 2020 at 12 :00 PM**

Date : 25-08-2020
Time : 12:00 PM (IST)
Topic : Talk at IITH
Speaker : **Dr. Sho Yaida**
Affiliation : Facebook AI Research (FAIR)
Title : **Machine-learning dynamics in and out of equilibrium**
Link : <https://meet.google.com/cyn-wktx-cme>



Abstract

The notion of the stationary equilibrium ensemble has played a central role in statistical mechanics. In machine learning as well, training serves as generalized equilibration that drives the probability distribution of model parameters toward stationarity. In the first half of the talk, focusing on equilibrium dynamics at long times, I will describe fluctuation-dissipation relations for the stochastic gradient descent algorithm, which can be used to adaptively set training schedules. In the second half, shifting focus to out-of-equilibrium dynamics near initialization, I will describe a theoretical framework that can predict the optimal way of initializing/architecting deep neural networks, maximally mitigating the infamous exploding and vanishing gradient problems.

Short Bio:

Sho Yaida is a Research Scientist at Facebook AI Research (FAIR). Prior to joining FAIR, during Ph.D. training at Stanford, his interests centered around black holes; then, while doing postdoctoral work at MIT and Duke, his research focus shifted to the physics of glass. He is currently having fun at FAIR, adapting toolkits in theoretical physics in order to understand neural networks of practical interests.