



Optimization and Machine Learning Seminar

Mean field theory in Inverse Problems: from Bayesian inference to overparameterization of networks

Professor Qin Li

University of Wisconsin-Madison, United States

Abstract

Bayesian sampling and neural networks are seemingly two different machine learning areas, but they both deal with many particle systems. In sampling, one evolves a large number of samples (particles) to match a target distribution function, and in optimizing over-parameterized neural networks, one can view neurons particles that feed each other information in the DNN flow. These perspectives allow us to employ mean-field theory, a powerful tool that translates dynamics of many particle system into a partial differential equation (PDE), so rich PDE analysis techniques can be used to understand both the convergence of sampling methods and the zero-loss property of over-parameterization of ResNets. We showcase the use of mean-field theory in these two machine learning areas, and we also invite the audience to brainstorm other possible applications.

Date:	January 28, 2022 (Friday)
Time:	10:00 - 11:00am (Hong Kong Time)
Venue:	ZOOM: https://hku.zoom.us/j/
	Meeting ID: 940 0962 9889
	Password: 286660