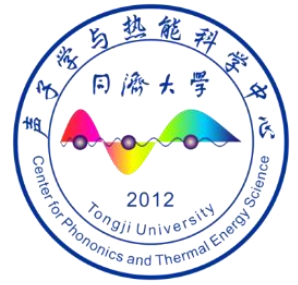


学术讲座



同济大学
TONGJI UNIVERSITY

物理科学与工程学院
声子学与热能科学中心



报告人：张潘

中科院理论物理研究所

时间：11月9日（周五），上午10:30-11:30

地点：南校区第一实验楼423会议室

Solving Statistical Mechanics using Variational Autoregressive Networks

报告摘要：

In statistical physics, we are interested in hard tasks such as computing free energy, estimating physical quantities such as magnetizations and correlations, and generating uncorrelated samples. In this talk I will introduce a new framework for solving these statistical mechanics problems for systems with a finite size. The approach extends the celebrated variational mean-field approaches using autoregressive networks, a neural network model which supports direct sampling and exact calculation of normalized probability of configurations. Training of the network employs the policy gradient approach in reinforcement learning, which unbiasedly estimates the gradient of variational parameters. We apply our approach to several classic systems, including 2-d Ising models, Hopfield model, Sherrington--Kirkpatrick spin glasses, and the inverse Ising model, for demonstrating its advantages over existing variational mean-field methods.

Reference: arXiv:1809.10606

个人简介：

张潘：本科,博士毕业于兰州大学，其后在法国巴黎的统计物理研究组，以及美国圣塔菲研究所做博士后研究，并于2015年就职于中科院理论物理研究所。张潘的研究方向为统计物理与机器学习的交叉领域，近年研究兴趣集中在网络推断/聚类问题中的自旋玻璃理论，以及基于量子和统计物理的非监督机器学习方法。

