



Department of Data Science

香港城市大學  
City University of Hong Kong

# DS SEMINAR

# Uncertainty Quantification for Scientific Machine Learning

Date: 28 February 2025 (Friday)

Time: 9:30am - 10:30am

Seminar Link: <https://cityu.zoom.us/j/86063663556>



## ABSTRACT

Scientific Machine Learning (SML) is an emerging interdisciplinary field with wide-ranging applications in domains such as public health, climate science, and drug discovery. The primary goal of SML is to develop data-driven surrogate models that can learn spatiotemporal dynamics or predict key system properties, thereby accelerating time-intensive simulations and reducing the need for real-world experiments. To make SML approaches truly reliable for domain experts, Uncertainty Quantification (UQ) plays a critical role in enabling risk assessment and informed decision-making. In this presentation, I will first introduce our recent advancements in UQ for spatiotemporal and multi-fidelity surrogate modeling with Bayesian deep learning, focusing on applications in accelerating computational epidemiology simulations. Following this, I will demonstrate how quantified uncertainties can be leveraged to design sample-efficient algorithms for adaptive experimental design, with a focus on Bayesian active learning and black-box optimization for scientific discovery.



## Mr. Dongxia WU

### GUEST SPEAKER'S PROFILE

Dongxia (Allen) Wu (<https://dongxiaw.github.io/online-cv/>) is a Ph.D. student in the Department of Computer Science and Engineering at UC San Diego, advised by Rose Yu and Yian Ma. His research focuses on Bayesian Deep Learning, Sequential Decision Making, Scientific Machine Learning, and Spatiotemporal Modeling, with applications in public health, climate science, and drug design. His work has been published in ICML, KDD, AISTATS, and PNAS. He developed DeepGLEAM for COVID-19 incident death forecasting, which achieved the highest coverage ranking in the CDC Forecasting Hub. He is also the recipient of UCSD HDSI Ph.D. Fellowship.

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All are welcome