

Hong-Kun ZHANG, University of Massachusetts, USA

Title: Data-Driven Learning of Dynamical Systems Using Discrete-Temporal Sobolev Networks

Abstract: In this talk, we delve into the forefront of data-driven methodologies for understanding complex dynamical systems, focusing on the Lorentz system and the standard map. We have developed the innovative approach of Discrete-Temporal Sobolev Networks, to capture the intricate behaviors inherent in chaotic systems. This technique, rooted in the latest advancements in machine learning and neural networks, presents a novel framework for the data-driven learning of dynamical systems' trajectories. We will also demonstrate the models for the Lorentz system and the standard map, showcasing their potential to generalize and predict complex system dynamics.