



The Math/Stats Colloquium
Department of Mathematics and Statistics
San José State University



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UC Santa Cruz

Towards Rigorous Frameworks for Scientific Machine Learning: Theory and Applications for Multi-Scale Chaotic Dynamical Systems

WED NOV 01, 2023, MH320

Abstract: Predictions about multi-scale high-dimensional chaotic systems like weather and climate remain a grand scientific challenge. Recent success in deep learning holds hope for predicting such systems up to the smallest scales. However, algorithms that have succeeded in computer vision and natural language cannot directly be applied to scientific problems. This talk will revolve around building scientific machine learning frameworks wherein scientific priors, inspired by physics and numerical methods, can be baked into learning architectures. We will explore different failure modes and their mitigation strategies to build an “explainability” framework for machine learning models of multi-scale PDEs, grounded in physical and deep learning theory.

Background: No particular background necessary.

About the speaker: Ashesh is an Asst. Prof. of applied mathematics at UC Santa Cruz. He did his PhD at the intersection of computational physics and deep learning theory at Rice Univ. Previously, he was a staff scientist at Xerox PARC and SRI International.

SNACKS IN MACQUARRIE HALL 331B AT 2:40PM

TALK STARTS AT 3:00PM

For more information, see our full schedule at:

<http://www.timhsu.net/colloq/>