复旦大学数学科学学院
数学综合报告会

报告题目： Solving PDEs with Machine Learning: Strengths, Limitations, and Open Challenges

报告人：AvH Professor Enrique Zuazua （Friedrich-Alexander-Universität Erlangen-Nürnberg）

时间：2025-09-10 星期三 11:00-12:00
地点：光华东主楼1801

报告摘要：

In this talk, we discuss cooperative strategies for constructing mathematical models of physical systems from data. Conventional approaches typically rely either on data-driven, lightweight synthetic models—such as neural networks—or on high-fidelity physics-based models that can be computationally intensive. Our Hybrid-Cooperative (HYCO) approach bridges these two paradigms by hybridizing them and collapsing their complementary strengths into a unified framework. By combining the empirical insights extracted from data with the structural knowledge of the physical models generating that data, HYCO achieves robust and accurate representations of underlying physical phenomena. Through a series of numerical experiments, we demonstrate that HYCO outperforms classical methods in learning physical models, particularly in challenging scenarios involving sparse, noisy, or localized datasets
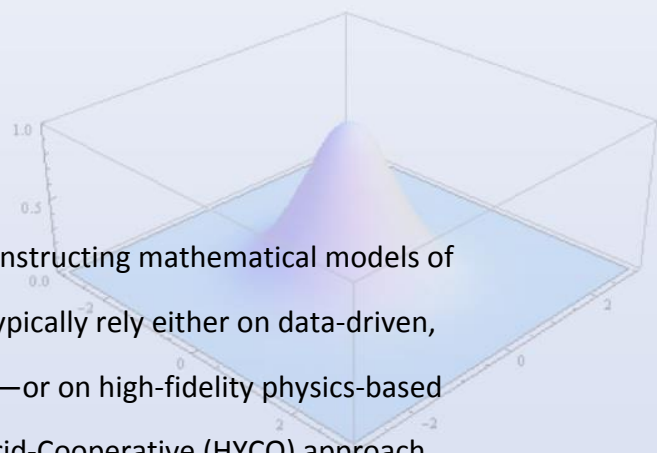
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