

NUMERICAL ANALYSIS AND SCIENTIFIC COMPUTING
SEMINAR

Scientific Machine Learning: Learning from Small Data

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Abstract: Deep learning has achieved remarkable success in diverse applications; however, its use in scientific applications has emerged only recently. I have developed multi-fidelity neural networks to extract mechanical properties of solid materials (including 3D printing materials) from instrumented indentation. I have improved the physics-informed neural networks (PINNs) and developed the library DeepXDE for solving forward and inverse problems for differential equations, including partial differential equations (PDEs), fractional PDEs, and stochastic PDEs. I have also developed the deep operator network (DeepONet) based on the universal approximation theorem of operators to learn nonlinear operators (e.g., dynamical systems) accurately and efficiently from a relatively small dataset. In addition, I will present my work on the deep learning theory of optimization and generalization.

Friday, April 24, 2020, 2:00 pm
<https://emory.zoom.us/j/313230176>

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