JOHNS HOPKINS
WHITING SCHOOL
of ENGINEERING

Department of Civil and Systems Engineering

Employing Deep Learning Approaches to Solve Problems in "Computational Mechanics"

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Abstract

A new paradigm in scientific research has been established with the integration of data-driven and physics-informed methodologies in the domain of deep learning, and it is certain to have an impact on all areas of science and engineering. This field, popularly termed "scientific machine learning," relies on an over-parametrized deep learning model trained with (or without) high-fidelity data (simulated or experimental) to be able to generalize the solution field across multiple input instances. The neural operator framework fulfills this promise by learning the mapping between infinite dimensional functional spaces. The application of neural operators' techniques within the context of high-dimensional problems to resolve efficiently and accurately time-dependent and -independent PDEs in mechanics will be the major focus of this presentation.

About Our Speaker

Dr. Somdatta Goswami is an assistant professor in Johns Hopkins University's Department of Civil and Systems Engineering. With a background in civil engineering, she specializes in developing innovative and efficient scientific machine-learning algorithms for high-dimensional physics-based systems. Her research is dedicated to advancing the fields of computational mechanics and biomechanics with the integration of deep learning frameworks with established solution strategies.

More Information:

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