

## **Title: Physics-Informed Neural Networks (PINNs) for Biomedical Applications**

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We will present a new approach to develop a data-driven, learning-based framework for predicting outcomes of physical and biological systems and for discovering hidden bio-physics from noisy data. We will introduce a deep learning approach based on neural networks (NNs) and generative adversarial networks (GANs). Unlike other approaches that rely on big data, here we “learn” from small data by exploiting the information provided by the physical and biochemical laws, which are used to obtain informative priors or regularize the neural networks.. We will demonstrate the power of PINNs for inverse problems in bio-fluid mechanics, e.g., inferring the wall shear stress in brain aneurysms from dye visualizations only, and also in systems biology by inferring the dynamics of yeast glycolysis, which has become a standard test case for biochemical dynamics inference.