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MRB Seminar Room (1st Floor)

The Colloquium Talk is sponsored by the UC Riverside Artificial Intelligence Research and Education Institute and the Interdisciplinary Center for Data-driven Modeling in Biology



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Dr. Schiavazzi is an Associate Professor in the ACMS Department, and a Concurrent Associate Professor in the AME Department at the University of Notre Dame. He graduated with honors and received a Ph.D. degree in Applied Mathematics from Universita' degli Studi di Padova, Italy. Dr. Schiavazzi completed his Ph.D. thesis as a Visiting Researcher at Stanford University, followed by a Postdoctoral position at University of California, San Diego and Stanford University. His main research interests are in stochastic analysis, multi-resolution approximation, numerical modeling and finite element analysis, adaptive Markov chain Monte Carlo estimation and use of computational models to inform clinical decision making under uncertainty.

Model Synthesis for Scientific Agents

Applications of generative modeling and deep learning in physics-based systems have traditionally focused on building emulators - computationally inexpensive approximations of input-to-output maps. However, the remarkable flexibility of data-driven architectures opens opportunities to broaden their scope to include model inversion and identifiability analysis. We present InVAert networks, a framework for data-driven analysis and synthesis of parametric physical systems. Through numerical experiments, we demonstrate the framework's versatility across a wide range of problems, including linear systems of equations, spatio-temporal PDEs, and lumped-parameter physiological models. We further introduce an extension for systems with observational noise, enabling the separation of structural from practical identifiability in complex ill-posed inverse problems. Finally, we discuss recent efforts to integrate InVAert networks with large language model agents for applications in cardiovascular health.