

CRUNCH Seminars at Brown, Division of Applied Mathematics

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Solving and Learning Nonlinear PDEs with Gaussian Processes

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In this talk I present a simple, rigorous, and interpretable framework for solution of nonlinear PDEs based on the framework of Gaussian Processes. The proposed approach provides a natural generalization of kernel methods to nonlinear PDEs; has guaranteed convergence; and inherits the state-of-the-art computational complexity of linear solvers for dense kernel matrices. I will outline our approach by focusing on an example nonlinear elliptic PDE followed by further numerical examples. I will also briefly comment on extending our approach to solving inverse problems.