Rohit Tripathy

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Education

- **Purdue University** — West Lafayette, IN
  PhD., Mechanical Engineering; GPA - 3.8/4.0 — *January. 2016 - Dec 2019 (expected)*
  - Advisor: Prof. Ilias Bilionis
  - Relevant courses: Statistical Machine Learning, Computational Methods in Optimization, Stochastic Processes, Monte Carlo Methods, Decision Theory and Bayesian Statistics, Uncertainty Quantification, Numerical methods.
- **Purdue University** — West Lafayette, IN
  MS., Mechanical Engineering; GPA - 3.61/4.0 — *August 2014-December 2015*
- **VIT University** — Vellore, India
  B. Tech., Mechanical Engineering; GPA - 9.04/10.0. — *July 2010-May 2014*

Work Experience

- *Givens Associate*, Argonne National Laboratory, Lemont, IL (June 2017 - August 2017).
- *Quantitative Research (Machine Learning) Summer Associate*, JPMorgan Chase & Co., New York, NY (May 2018 - *Present*)

Research Experience

- **Predictive Science Lab, Purdue University** — West Lafayette, IN
  Graduate Research Assistant — *August 2014 - Present*
  - Surrogate modeling for high-dimensional and multifidelity uncertainty quantification.
  - Developed a scalable *Gaussian process regression* technique and currently exploring Deep neural networks for high dimensional input uncertainty quantification tasks.
- **Math. and Computer Science (MCS) division, Argonne National Lab** — Lemont, IL
  Givens associate (PhD intern) — *June 2017 - August 2017*
  - Explored the use of machine learning methods for wind speed forecasting. In particular, used deep learning techniques for sequence modeling such as LSTMs.

Publications and pre-prints

- Rohit Tripathy, Ilias Bilionis, and Marcial Gonzalez. *Gaussian processes with built-in dimensionality reduction: Applications to high-dimensional uncertainty propagation.* Journal of Computational Physics 321 (2016): 191-223.
- Rohit Tripathy and Ilias Bilionis. *Deep UQ: Learning deep neural network surrogate models for high dimensional uncertainty quantification.* arXiv preprint arXiv:1802.00850 (2018). (under review at *Journal of Computational Physics*)

Recent Talks / Presentations

- **SIAM UQ 2018** — Garden Grove, CA
  Learning Deep neural network (DNN) surrogate models for uncertainty quantification. — *April 2018*

- **SIAM AN 2017** Pittsburgh, PA
  High dimensional multifidelity uncertainty quantification with deep neural networks. *July 2017*
- **SIAM DR 2017** Pittsburgh, PA
  Discovering nonlinear active subspaces using deep neural networks. *July 2017*
- **SIAM CSE 2017** Atlanta, GA
  Learning multiscale stochastic FEM basis functions with deep neural networks. *March 2017*

Other Projects

- **Uncertainty propagation using kernel ridge regression.**
  Statistical Machine Learning course, CS 578. *Jan. 2018 - May 2018*
  - Implemented kernel ridge regression and conducted hyperparameter optimization to learn a surrogate for the forward model in a stochastic elliptic partial differential equation. Implemented code in `Python`.
- **Optimization over the Stiefel Manifold.**
  Computational methods in optimization course, CS 520 *Jan. 2016 - May 2016*
  - Implemented, in `Python`, a modified form of gradient descent on manifold space, with update scheme based on the Cayley transform.
- **Finite element solver for a plane stress hypoelasticity problem.**
  Finite Element Methods course, ME 681. *Jan. 2015 - May 2015*
  - Implemented in `Python` from scratch a nonlinear finite element solver for 2D hypoelasticity problem for a square plate.
- **2-D Incompressible Navier Stokes solver**
  Computational Fluid Dynamics course, ME 614 *Jan. 2015 - May 2015*
  - Implemented, in `Python`, from scratch, a fully conservative finite difference solver with a staggered grid formulation to solve the lid driven cavity problem.

Skills

Languages (In order of comfort): Python, R, MATLAB.

Deep Learning frameworks: Theano and tensorflow.

Bayesian Machine Learning frameworks: pymc, pymc3 and Edward.

Technical Interests

Machine Learning, Deep learning and Artificial Intelligence, Data Analysis, Big data, Scalable Inference, Bayesian data analysis, Quantitative finance, Quantitative research, Algorithmic trading.

Professional Memberships

- Society of Industrial and Applied Mathematics (SIAM) student member [*August 2015- present*].
- SIAM Purdue chapter Treasurer [*August 2016 - May 2017*].

Links

- **LinkedIn**: http://tinyurl.com/p4myxe8.
- **Speakerdeck**: http://speakerdeck.com/rohitkt10.
- **Active subspace project github**: https://github.com/PredictiveScienceLab/py-aspgp.