Agnimitra Dasgupta

Curriculum Vitae

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Summary

3rd year PhD student at the Sonny Astani Department of Civil & Environmental Engineering;
Interested in interdisciplinary research on uncertainty quantification;
Also working towards a Master's in Electrical Engineering;
Summa cum laude from IISc Bangalore and Jadavpur University Kolkata.

Research Interests

Uncertainty Quantification, statistical inference theory, model validation, multifidelity methods, reduced order modeling, linear and nonlinear dynamics, scientific machine learning

Education

2017 - Present **Ph.D.**, *University of Southern California*, Los Angeles, USA.
Advisor: Prof. Erik A Johnson, Vice Dean for Academic Programs, USC
Area: Uncertainty quantification, structural engineering

2017 – 2019 **Master of Science**, *University of Southern California, Los Angeles*, Los Angels, USA.
Ming Hsieh Department of Electrical and Computer Engineering
GPA: 4.0/4.0

2015 – 2017 **Master of Engineering**, *Indian Institute of Science*, Bangalore, India.
Major in Structural Engineering
Advisor: Prof. Debraj Ghosh, CEE, IISc Bangalore
Master's Thesis: Reduced order modeling in uncertainty quantification of dynamical systems
GPA: 8.0/8.0

2011 – 2015 **Bachelor of Engineering, Civil Engineering**, *Jadavpur University*, Kolkata, India.
GPA: 9.26/10

Research Experience

Fall 2017 – Present **Graduate Research Assistant**, *Sonny Astani Department of Civil & Environmental Engineering*.
University of Southern California, Los Angeles, USA
- CSD&E: Collaborative Research: A New Framework for Computational Model Validation, **National Science Foundation** (CMMI 16-63667/16-62992)
- Working on characterization of spatial heterogeneity in material specimens using a novel probabilistic hybrid framework composed of model falsification and Bayesian model selection.

July 2016 – June 2017 **Research Assistant**, *Department of Civil Engineering*.
Indian Institute of Science, Bangalore, India
- Reduced order modeling of time-varying dynamical systems.
- Reliability estimation using reduced order models.

May 2014 – June 2014 **Summer Intern**, *Reactor Safety Division*.
Bhabha Atomic Research Centre, Mumbai, India
- Modelling the 'bond' between concrete and rebar.
- Effect of elevated temperatures on the bond between concrete and rebar.

Teaching Experience

Graduate Teaching Assistant, *Sonny Astani Department of Civil & Environmental Engineering*, USC.

Fall 2019, Fall 2017
- CE529a Finite Element Analysis – Lead lab sessions introducing ABAQUS and helped students with their final project which involved FE analysis using Matlab and ABAQUS.

Spring 2019
- CE402 Numerical Methods in Engineering – Lead discussion sessions to help students with coding numerical techniques on Matlab and Python.

Spring 2018
- CE458 Theory of Structures- II – Lead lab sessions introducing SAP2000 and helped students with their final project which involved the modelling and analysis of a multistorey building.

Summer 2018 **Graduate Research Mentor**, *Viterbi Summer Institute Program*, USC.
- Mentored 4 incoming undergraduate students, providing them insight into on-going research in the Department.

Journal

○ *A. Dasgupta* and D. Ghosh, **Failure Probability Estimation of Linear Time Varying Systems by Progressive Refinement of Reduced Order Models**, *SIAM/ASA Journal on Uncertainty Quantification, Volume 7, Issue 3, Pages 1007–1028, 2019.* [link]

Conferences

○ *A. Dasgupta*, Q. Fang, E. A. Johnson, S. F. Wojtkiewicz, H. Fujitani, Y. Mukai, E. Sato, **Physics-informed machine learning using inferred-physics models: application to developing models for a MR damper** abstract submitted to *SIAM Conference on Uncertainty Quantification*, Garching-Munich, Germany, March 2020. (Awaiting decision)

○ *A. Dasgupta*, E. A. Johnson and S. F. Wojtkiewicz, **Characterization of spatial heterogeneity in material properties using a probabilistic hybrid approach**, *ASCE Engineering Mechanics Institute Conference*, Caltech, Pasadena, CA, June 2019.

○ *A. Dasgupta*, S. De, K. Teferra, E. A. Johnson, S. F. Wojtkiewicz and L. Graham-Brady, **Probabilistic validation of material models**, *ASCE Engineering Mechanics Institute Conference*, MIT, Cambridge, MA, May 2018.

○ S. De, T. Yu, *A. Dasgupta*, E. A. Johnson and S. F. Wojtkiewicz, **Probabilistic model validation of a full-scale four-story base-isolated building**, *ASCE Engineering Mechanics Institute Conference*, MIT, Cambridge, MA, May 2018.

○ *A. Dasgupta**, S. De*, E. A. Johnson and S. F. Wojtkiewicz, **Probabilistic model validation of large-scale systems using reduced order models**, *SIAM Conference on Uncertainty Quantification*, Orange County, USA, April 2018.

○ *A. Dasgupta* and D. Ghosh, **Progressively refining reduced order models for estimating failure probabilities of dynamical systems**, *SIAM Conference on Uncertainty Quantification*, Orange County, USA, April 2018.

Selected Honors & Awards

○ 2017-2021: **Provost PhD Fellowship**, University of Southern California, Los Angeles
○ 2018 : **Prof. N S Lakshmana Rao Medal** for best M. E. student (Rank -1) in Civil Engineering, IISc Bangalore.
○ 2015-2017: **2-year scholarship** for graduate study, Ministry of Human Resource & Development, India.
○ 2015 : **University Medal** (and 4 other medals) for standing First at the Bachelor of Civil Engineering, Jadavpur University.

Relevant Coursework

○ **Dynamics & Control :** Dynamical systems theory, nonlinear dynamics & vibration, linear control systems, structural dynamics, advanced structural dynamics (earthquake & wind) , estimation theory.
○ **Applied Math :** Uncertainty quantification, probability models, optimization methods, neural & fuzzy systems, pattern recognition, machine learning, deep learning, finite element analysis.
○ **Mechanics :** Solid mechanics, theory of plasticity, mechanics of structural concrete.

Skillsets

○ **Programming Languages:** Python, R, MATLAB, ABAQUS, SAP2000;
○ **Frameworks:** PyTorch, Tensorflow, Keras