PRAKASH CHAKRABORTY

Assistant Professor of Industrial and Manufacturing Engineering
The Pennsylvania State University, 310 Leonhard Building, University Park, PA 16802
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Research interests

Applied Probability, Stochastic Modelling, Stochastic Networks, Queuing Systems, Stochastic Control, Mean Field Games, Financial Mathematics, Rough Path Theory and applications in Machine Learning.

Education

Aug 2020: **Ph.D. in Statistics**, Purdue University.
Title: *Contributions to Rough Path Theory and Stochastic PDEs*
supervised by Prof. Kiseop Lee and Prof. Samy Tindel.
Jun 2015: **M.Stat**, Indian Statistical Institute, Kolkata, India.
Jun 2013: **B.Stat**, Indian Statistical Institute, Kolkata, India.

Work Experience

2022-*present*: **Assistant Professor**, The Pennsylvania State University
2020-2022: **Byrne Research Assistant Professor**, University of Michigan.
2016-2020: **Graduate Research and Teaching Assistant**, Purdue University.
2014: **Research Trainee**, Institute of Genetic Medicine, Johns Hopkins School of Medicine

Teaching Experience

2022: *Instructor* for Math 526, **Discrete State Stochastic Processes**, University of Michigan.
2021: *Instructor* for Math 472, **Numerical Methods with Financial Applications** (Masters in Quant Finance section), University of Michigan.
2021: *Instructor* for Math 526, **Discrete State Stochastic Processes**, University of Michigan.
2020: *Instructor* for Math 472, **Numerical Methods with Financial Applications**, University of Michigan.
2017-2018: *Teaching Assistant (exam-writer)* for Stat 301, **Elementary Stat Methods**, Purdue University.
2016-2017: *Teaching Assistant (recitation)* for Stat 301, **Elementary Stat Methods**, Purdue University.

Grants, honors and awards

2022: NSF Grant 2153915 ($106,517): *Continuous Time Reinforcement Learning using Rough Paths*, Role: co-PI
2020: Bob and Marjorie McLean Scholarship, Purdue Department of Statistics.
2020: I. W. Burr Award, Purdue Department of Statistics.
2020: William J. Studden Publication Award, Purdue Department of Statistics.
2019: Purdue Research Foundation Fellowship.
2019: American Mathematical Society Graduate Student Travel Grant.
2018: Institute of Mathematical Statistics Hannan Graduate Student Travel Award.
2017: Purdue Graduate Student Government Travel Award.

2015: Ross Fellowship, Purdue University Graduate School.
2010: Senior JBNSTS Scholarship recipient, West Bengal, India.
2010: INSPIRE Scholarship, DST, Govt. of India.

Service and Leadership

2021: Treasurer and Board Member at *University of Michigan Postdoctoral Association*.
2020: Reviewer for *Operations Research Letters*, *Stochastic Models*, *SIAM Journal on Optimization* and *AMS Mathematical Reviews*.
2017-2019: Graduate student member at *Grant Review and Allocation Committee* of Purdue Grad Student Government.
2017-2018: Purdue Grad Student Government *Senator from the Department of Statistics*.
2017-2018: Graduate student member to the *Purdue University Grade Appeals Committee* appointed by the Committee on Student Affairs of the University Senate.

Mentoring

2021: Research Experience for Undergraduates program.
Mentee: Mingxian Ge. *Topic:* Good-deal bounds in asset pricing.

Publications and Preprints

2022: Bond Prices Under Information Asymmetry and a Short Rate With Instantaneous Feedback, **(with Kiseop Lee)**, MCAP vol 24, pages613–634.
2021: Strong Embeddings for Transitory Queueing Model, **(with Harsha Honnappa)**, moor.2021.1158, Mathematics of Operations Research.
2021: Mean Field Control And Finite Agent Approximation For Regime-Switching Jump Diffusions, **(with Erhan Bayraktar)**, arXiv:2109.09134.
2021: Optimal Dividends Under Model Uncertainty, **(with Asaf Cohen and Virginia Young)**, arXiv:2109.09137.
2021: A Many-Server Functional Strong Law For A Non-Stationary Loss Model, **with Harsha Honnappa**, ORL 49, no. 3 (2021): 338-344, Operations Research Letters.
2020: Relativistic Stable Processes in Quasi-ballistic Heat conduction in thin film Semiconductors, (**with Ali Shakouri, Samy Tindel and Bjorn Vermeersch**), Phys. Rev. E 101, 042110, Physical Review E.
2020: Quenched asymptotics for a 1-d stochastic heat equation driven by a rough spatial noise, **(with Xia Chen, Bo Gao and Samy Tindel)**, spa.2020.06.007, Stochastic Processes and their Applications.
2019: Tiered Spectrum Measurement Markets for joint Licensed and Unlicensed Secondary Access, **(with Arnob Ghosh and Vaneet Aggarwal)**, 10.1109/TNSE.2019.2921782, IEEE Transactions on Network Science and Engineering.
2019: Rough Differential Equations with Power Type Nonlinearities, **(with Samy Tindel)**, SPA,V129,Issue5, Stochastic Processes and their Applications.
2015: Population variation in total genetic risk of Hirschsprung disease from common RET, SEMA3 and NRG1 susceptibility polymorphisms, **(with Ashish Kapoor, Qian Jiang, Sumantra Chatterjee, Maria X. Sosa, Courtney Berrios, Aravinda Chakravarti)**, HMG Volume 24 Issue 10, Human Molecular Genetics.

Presentations

Oct 2022: INFORMS Annual Meeting 2022.
Optimal Dividends Under Model Uncertainty.

Mar 2022: AMS Special Session on Gaussian and non-Gaussian Stochastic Analysis, AMS Spring Central Virtual Sectional Meeting.
Mean field control and finite agent approximation for regime-switching jump diffusions.

Oct 2021: INFORMS Annual Meeting 2021, Remote.
Mean field control and finite agent approximation for regime-switching jump diffusions.

Oct 2021: Financial/Actuarial Mathematics Seminar, University of Michigan.
Mean field control and finite agent approximation for regime-switching jump diffusions.

Oct 2020: INFORMS Annual Meeting 2020, Remote.
Functional Limits for a Many-server Non-stationary Loss Model.

Oct 2020: Financial/Actuarial Mathematics Seminar, University of Michigan.
Quenched Asymptotics for A 1-D Stochastic Heat Equation driven by a Rough Spatial Noise.

Dec 2019: Problems of roughness, geometry and random fluctuations, Haussdorff Research Institute for Mathematics, Bonn, Germany.
Path Confinement for the Continuous Polymer Measure.

Oct 2019: INFORMS Annual Meeting 2019, Seattle.
Functional Limits for Stochastic Fluid Flow Models.

Apr 2019: AMS Sectional Meeting, University of Connecticut Hartford.
Quenched Asymptotics for A 1-D Stochastic Heat Equation driven by a Rough Spatial Noise.

Nov 2018: Purdue Probability Seminar.
Quenched Asymptotics for a 1-D Stochastic Heat Equation driven by a Rough Spatial Noise.

Jun 2018: 40th Conference on Stochastic Processes and their Applications, Gothenburg.
Rough Differential Equations with Power Type Nonlinearities.

Oct 2017: Stochastics/Probability Seminar, University of Tennessee Knoxville.
Rough Differential Equations with Power Type Nonlinearities.

Professional Skills

R, Matlab, Python, Julia, Git, LaTeX

Professional Memberships

- Institute for Operations Research and the Management Sciences (INFORMS)
- Society for Industrial and Applied Mathematics (SIAM)
- Institute of Mathematical Statistics (IMS)
- American Mathematical Society (AMS)