

Shuo Yan

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Research interests

Probability Theory and Stochastic Processes

Education

- 2018 – Present **University of Maryland, College Park** – College Park, Maryland, USA
Teaching Assistant, Ph.D. candidate in Mathematics
Advisor: Dr. Leonid Korolov
Courses: Probability Theory I, Probability Theory II, Applied Stochastic Processes, Dynamical Systems, Partial Differential Equations I, Partial Differential Equations II, Machine Learning, Mathematical Methods in Machine Learning, Mathematical Statistics I, Functional Analysis, Nonlinear Functional Analysis, Stochastic Dynamics, Reaction-Diffusion Equations
- 2014 – 2018 **Nankai University** – Tianjin, China
Bachelor of Science in Pure Mathematics
Advisor: Dr. Kai-Nan Xiang
- 2016 **University of California, Berkeley** – Berkeley, California, USA
Visiting Student at the Department of Mathematics

Publications

- 2023 **Fast oscillating random perturbations of Hamiltonian systems**
Shuo Yan
Submitted to Probability Theory and Related Fields. [arXiv: 2307.14597](#).
- 2023 **Energy growth for systems of coupled oscillators with partial damping**
Dimitry Dolgopyat, Bassam Fayad, Leonid Korolov, Shuo Yan
Preprint. [arXiv: 2312.01207](#).
- 2023 **Local limit theorem for time-inhomogeneous functions of Markov processes**
Leonid Korolov, Shuo Yan
Preprint. [arXiv: 2308.00880](#).

- 2022 **Large deviations for Hamiltonian systems on intermediate time scales**
Shuo Yan
Stochastics and Dynamics Vol. 22, No. 06, 2250025 (2022), 46 pp. arXiv: 2111.06528.

Conference Talks

- 2023 **Spring 2023 Conference on Applied Mathematics**
The George Washington University Chapter of SIAM
- 2022 **Modern Topics in Probability**
Brin Mathematics Research Center, University of Maryland

Internships

- May 2023 –
August 2023 **Constrained Reinforcement Learning by Lagrangian Primal-dual Optimization**
Argonne National Laboratory
Mentor: Dr. Yixuan Sun
Considered constrained Markov Decision Processes with safety criteria for both states and actions. Devised a deep reinforcement learning algorithm based on the method of Lagrangian Multiplier and Proximal Policy Optimization. This algorithm effectively learns a policy that performs admirably in the primary task while adhering to specified safety constraints.
- June 2020 –
August 2020 **Large Deviations for Fluctuating Hydrodynamics**
Lawrence Berkeley National Lab
Mentor: Dr. Daniel Ladiges
Studied one-dimensional effusions involving low-concentration reservoirs. Constructed simulations to analyze trajectory distributions using branching processes in discrete scenarios and Ornstein–Uhlenbeck processes in continuous scenarios. Developed a large deviation theory based on the theoretical models and conducted numerical experiments to validate and refine the model’s characteristics.

Summer Schools

- July 2017 **Algorithm and Introduction to Neural Network and Deep Learning**
Peking University
- July 2016 **Construction and Properties of Brownian Motion**
Fudan University

Teaching experience

Teaching	STAT 100: Elementary Statistics and Probability STAT 400: Applied Probability and Statistics I MATH 240: Introduction to Linear Algebra MATH 241: Calculus III
Grading	STAT 410: Introduction to Probability Theory STAT 426: Introduction to Data Science and Machine Learning STAT 470: Actuarial Mathematics STAT 600: Probability Theory I STAT 601: Probability Theory II MATH 410: Advanced Calculus I MATH 462: Partial Differential Equations
Mentoring	Directed Reading Programs Markov Chains; Stochastic Calculus for Finance

Fellowships and Awards

2023	Ann G. Wylie Dissertation Fellowship
2022	Herbert A. Hauptman Endowed Graduate Fellowship
2021	Graduate School Summer Research Fellowship
2018, 2019	Dean's Fellowship
2017	Honorable Mention of the Mathematical Contest in Modeling
2014, 2017	Pure Mathematics Fellowship of Nankai University