<u>Yinbin Han</u>

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EDUCATION	University of Southern California Ph.D. Student, Industrial and Systems Engineering Advisor: Meisam Razaviyayn, Renyuan Xu	Aug 2021 – Present	
	Chinese University of Hong Kong, Shenzhen B.S. in Mathematics	Sep 2017 – Jun 2021	
	University of California, Berkeley Exchange Student	Jan 2020 – May 2020	
RESEARCH INTERESTS	 Applied Probability and Stochastic Modeling Nonconvex Optimization and Stochastic Optimization Data-driven Decision Making and Reinforcement Learning Stochastic Control and Mathematical Finance Diffusion Models and Schrödinger Bridge 	5	
PROJECTS	 Score Approximation, Optimization and Generalization Mar 2023 - Present Advisor: Meisam Razaviyayn, Renyuan Xu Investigated denoising score matching via neural networks training to learn the score function. Overcame challenges of unbounded input, vector-valued output, and an additional time variable. 		
	• Leveraged the properties of the Ornstein-Omenbeck process to approximate the score function using reproducing kernel Hilbert space induced by the neural tangent kernel.		
	• Linked neural network training to kernel regression for overparameterized neural networks to establish the convergence of gradient descent.		
	• Analyzed the generalization properties of gradient descent in training neural networks with an early stopping rule.		
	 Policy Gradient Converges to the Globally Optimal Linear-Quadratic Regulators Advisor: Meisam Razaviyayn, Renyuan Xu Studied an optimal control problem with quadratic cost an consisting of a linear part and a nonlinear kernel basis gover is the sum of a linear and a nonlinear component. 	Policy for Nearly Jan 2022 - Mar 2023 USC ad nonlinear dynamics rned by a policy which	
	• Investigated the optimization landscape of the cost function. Proved a local strong convexity property of the cost function in the neighborhood of a carefully chosen initialization. Showed that the globally optimal solution must be attained near the initialization when the nonlinear component is small.		
	• Proposed a zeroth-order policy gradient algorithm with a carefully designed initialization scheme. Proved the linear convergence rate of the algorithm and analyzed the sample complexity.		
	Optimal Switching Policy for Batch Servers Advisor: Zizhuo Wang	Sep 2020 – Nov 2022 CUHKSZ	

	• Studied an optimal switching problem for batch servers: f processes and two batch servers, given the current a to switch the two servers in order to maximize the to customers by the end of the time horizon.	For two arrival stochastic rrivals, decide whether tal expected number of	
	• Proved the optimality condition, derived an explicit formula of the optimal value function, and designed an optimal threshold-based switching policy.		
	• Examined the monotonicity of optimal switching time the parameters, including the time horizon, arrival rates	resholds with respect to , and server capacities.	
	• Established an upper and a lower bound of the long-run flexibility and provided the $\Theta(\sqrt{T})$ asymptotic tight bor regime.	benefits with switching und under the proposed	
	• Organized numerical experiments to evaluate the perfessivity policy. Illustrated the monotonicity of time t and validated the asymptotic bound.	ormance of the optimal hresholds in parameters	
JOURNAL PUBLICATIONS	 Y. Han and Z. Wang. "Optimal Switching Policy for Bat Research Letters, 2023. 	tch Servers." Operations	
WORKING PAPERS	1. Y. Han, M. Razaviyayn, and R. Xu. "Neural network-based score estimation in diffusion models: Optimization and generalization." Submitted to <i>ICLR 2024</i> .		
	• Short version accepted by NeurIPS workshop on Diffusion Models, 2023.		
	 Y. Han, M. Razaviyayn, and R. Xu. "Policy Gradient Converges to the Globally Optimal Policy for Nearly Linear-Quadratic Regulators." Major revision, SIAM Journal on Control and Optimization, 2023. 		
	• Short version accepted by <i>NeurIPS workshop Op</i> <i>Learning</i> , 2022.	timization for Machine	
INVITED TALKS	NeurIPS 2023 Workshop on Diffusion Models. New Orle	ans Dec 2023	
	• INFORMS Annual Meeting, Phoenix	Oct 2023	
	• NeurIPS 2022 Workshop OPT2022, New Orleans	Dec 2022	
	• INFORMS Annual Meeting, Indianapolis	Nov 2022	
REVIEWERS	• Conferences: ICLR, ICML, NeurIPS, AISTATS, UAI		
TEACHING EXPERIENCE	USC, Teaching AssistantOptimization Methods for Analytics	Fall 2023, Spring 2024	
	CUHKSZ, Undergraduate Student Teaching Fellow • Ordinary Differential Equations	Spring 2021	
	• General Biology	Summer 2019	
AWARDS & HONORS	• National Scholarship of China	2020	
	• Academic Performance Scholarship, CUHKSZ	2018, 2019, 2020	
	• Dean's List, CUHKSZ	2018, 2019, 2020	

TECHNICAL SKILLS

Programming Languages:

- Proficient in Python, Numpy, Pandas, R, and MATLAB
- Familiar with Java, C/C++, MySQL
- Experience with Hadoop, Spark, and CUDA