

Yige Hong

PhD student, Computer Science Department, CMU

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Research Interest

My research focuses on understanding large stochastic systems with inherent structures. These systems typically arise in queueing theory and decision-making contexts, with examples including multiserver queues, stochastic bin-packing, restless bandits, weakly-coupled Markov decision processes, and network resource allocation. Despite their large state spaces and complex dynamics, such systems often display favorable asymptotic behaviors, such as state-space concentration or asymptotic independence. I investigate these phenomena by applying stochastic analysis tools — like Lyapunov functions, coupling methods, and Stein’s method — in innovative ways, to analyze system performance and design near-optimal control policies.

Education

Carnegie Mellon University <i>PhD, Computer Science Department (Advisor: Weina Wang)</i>	Sep 2020 – Present Pittsburgh, USA
Chinese University of Hong Kong, Shenzhen <i>Bachelor of Science in Applied Math</i>	Sep 2016 – May 2020 Shenzhen, China

Awards & Honors

IFIP Performance 2023 Best Paper Award, Winner	2023
ACM Sigmetrics 2021 Student Research Competition, Second Place	2021

Conference publications

Yige Hong, Qiaomin Xie, Weina Wang (2024). Near-Optimal Stochastic Bin-Packing in Large Service Systems with Time-Varying Item Sizes. *ACM SIGMETRICS*, June 2024.

Isaac Grosz, Yige Hong, Mor Harchol-Balter, Alan Scheller-Wolf (2023). The RESET and MARC Techniques, with Application to Multiserver-Job Analysis. *IFIP Performance*, November 2023.

Yige Hong, Qiaomin Xie, Yudong Chen, Weina Wang (2023). Restless Bandits with Average Reward: Breaking the Uniform Global Attractor Assumption. *Advances in Neural Information Processing Systems (NeurIPS)* 36, 2023. **[Spotlight paper]**

Yige Hong, Ziv Scully (2023). Performance of the Gittins Policy in the G/G/1 and G/G/k, With and Without Setup Times. *IFIP Performance*, November 2023. **[Best Paper Award]**

Yige Hong, Weina Wang (2022). Sharp Waiting-Time Bounds for Multiserver Jobs. In *ACM Int. Symp. Mobile Ad Hoc Networking and Computing (MobiHoc)*. Seoul, South Korea.

Journal publications

Yige Hong, Weina Wang (2024) Sharp Waiting-Time Bounds for Multiserver Jobs. *Stochastic Systems* 14(4):455-478.

Preprints

Xiangcheng Zhang, Yige Hong, Weina Wang (2025). ID policy (with reassignment) is asymptotically optimal for heterogeneous weakly-coupled MDPs. *arXiv preprint arXiv:2502.06072*.

Yige Hong, Qiaomin Xie, Yudong Chen, Weina Wang (2024). Achieving Exponential Asymptotic Optimality in Average-Reward Restless Bandits without Global Attractor Assumption. *arXiv preprint arXiv:2405.17882*.

Yige Hong, Qiaomin Xie, Yudong Chen, Weina Wang (2024). Unichain and Aperiodicity are Sufficient for Asymptotic Optimality of Average-Reward Restless Bandits. *arXiv preprint arXiv:2402.05689*.

Conference Presentations and Posters

“Unichain and Aperiodicity are Sufficient for Asymptotic Optimality of Average-Reward Restless Bandits,” INFORMS annual meeting, Seattle, WA, Oct 2024.

“Restless Bandits with Average Reward: Breaking the Uniform Global Attractor Assumption,” Advances in Neural Information Processing Systems (NeurIPS), New Orleans, LA, Dec. 2023.

“Performance of the Gittins Policy in the G/G/1 and G/G/K, with and Without Setup Times,” IFIP Performance Conference, Chicago, IL, Nov. 2023.

“Performance of the Gittins Policy in the G/G/1 and G/G/K, with and Without Setup Times,” INFORMS annual meeting, Phoenix, AZ, Oct. 2023.

“Performance of the Gittins Policy in the G/G/1 and G/G/K, with and Without Setup Times,” Workshop on Mathematical Performance Modeling and Analysis (MAMA), Orlando, FL, June. 2023.

“Maximizing utilization in large systems serving jobs with time-varying resource requirements,” INFORMS annual meeting. Indianapolis, IN, Oct. 2022.

“Maximizing utilization in large systems serving jobs with time-varying resource requirements,” (poster) Stochastic Networks Conference. Cornell University, Ithaca, NY, June 2022.

“Sharp waiting-time bounds for multiserver jobs,” ACM Mobihoc. Seoul, South Korea, Oct. 2022.

“Sharp zero-queueing bounds for multiserver-job systems,” INFORMS annual meeting. Anaheim, CA, Oct. 2021.

“Sharp zero-queueing bounds for multi-server jobs,” ACM Sigmetrics SRC. Beijing, China, June 2021.