

HOANG H. NGUYEN

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Research Interests

My research focuses on finite-time convergence bounds of queuing systems and continuous optimization algorithms through the lens of the Lyapunov drift framework. On the application side, I'm working on Deep Learning methods for Mathematics and Sciences.

Education

Georgia Institute of Technology

Ph.D. in Algorithms, Combinatorics, and Optimization

M.S. in Operations Research

Advisor: Professor Siva Theja Maguluri

Atlanta, GA

2021-2027 (expected)

2024

Minerva Schools at KGI

Bachelor of Science, Computational Sciences

San Francisco, CA

2021

Journal and Conference Publications

[P11] "Discrete Markov Chain Mixing Analysis: a Bakry-Emery Approach".

Hoang Huy Nguyen, Aditya Lonkar, Siva Theja Maguluri

In preparation

[P10] "Almost Sure Convergence of Stochastic Approximation: An Interplay of Noise and Step Size".

Duc Anh Nguyen, Quang Dinh Thien Nguyen, **Hoang Huy Nguyen**, Siva Theja Maguluri

NeuRIPS MLxOR Workshop 2025

Submitted

[P9]* "Gold-medalist Performance in Solving Olympiad Geometry with AlphaGeometry2".

Trieu Trinh, Yuri Chervonyi, Xiaomeng Yang, Mirek Olsak, **Hoang Nguyen**, Marcelo Menegali, Junehyuk Jung, Vikas Verma, Thang Luong, Quoc Le

Journal of Machine Learning Research (JMLR), 2025

[P8] "Creativity or Brute Force? Using Brainteasers as a Window into the Problem-Solving Abilities of Large Language Models".

Simeng Han, Stephen Xia, Grant Zhang, Howard Dai, Chen Liu, Lichang Chen, **Hoang Huy Nguyen**, Hongyuan Mei, Jiayuan Mao, R. Thomas McCoy

NeuRIPS 2025.

[P7]* "Towards Robust Evaluation for Mathematical Reasoning".

Thang Luong, Dawsen Hwang[#], **Hoang H. Nguyen**[#], Golnaz Ghiasi[#], Yuri Chervonyi[#], Insuk Seo[#], Junsu Kim[#], Garrett Bingham, Swaroop Mishra, Alex Zhai, Clara Huiyi Hu, Henryk Michalewski, Jimin Kim, Jeonghyun Ahn, Junhwi Bae, Trinh H. Trieu, Quoc V Le, Junehyuk Jung

EMNLP 2025.

[#] Core and equal contributors

[P6] "Widespread underestimation of rain-induced respiration pulses in global drylands".

Ngoc B Nguyen, Mirco Migliavacca, Maoya Bassiouni, Dennis D Baldocchi, Laureano A Gherardi, Julia K Green, Dario Papale, Markus Reichstein, Kai-Hendrik Cohrs, Alessandro Cescatti, Tuan Dung Nguyen, **Hoang H. Nguyen**, Quang Minh Nguyen, Trevor F Keenan

Nature Geoscience 2025.

2025 FLUXNET Paper of the Year.

[P5] "Finite-Time behavior of Erlang-C Model: Mixing Time, Mean Queue Length and Tail Bounds".

Hoang Huy Nguyen, Sushil Varma, Siva Theja Maguluri

ACM SIGMETRICS 2025.

Major Revision at Operations Research.

ACM SIGMETRICS 2025 Student Research Contest Second Prize.

[P4] "Foundation Model and Temporal Priors-guided Transductive Few-shot Action Recognition".

Bach Vu, **Hoang Nguyen**, Quang M. Nguyen, Duong Le, Hieu Pham, Phi Le Nguyen, Lam M. Nguyen

ICASSP 2025.

[P3] "On Partial Optimal Transport: Duality, Gradient Methods and Infeasibility of Sinkhorn".

Duc Anh Nguyen, Dung Tuan Nguyen, Quang Minh Nguyen, **Hoang Huy Nguyen**, Lam Minh Nguyen, Kim Chuan Toh

Proceedings of the AAAI Conference on Artificial Intelligence 2024

[P2] "Stochastic Approximation for Nonlinear Discrete Stochastic Control: Finite-Sample Bounds".

Hoang Huy Nguyen, Siva Theja Maguluri
IEEE CDC 2023 (Conference version).
IEEE Transactions on Automatic Control 2026 (Journal version).

[P1] "On Unbalanced Optimal Transport: Gradient Methods, Sparsity, and Approximation Error".
Quang Minh Nguyen, **Hoang H. Nguyen**, Lam Minh Nguyen, Yi Zhou
Journal of Machine Learning Research (JMLR), 2023
* indicates the research was conducted during the internship at Google DeepMind in 2024 and 2025.

Other Publications

[O1]* "Gemini 1.5: Unlocking Multimodal Understanding Across Millions of Tokens of Context".
Rohan Anil, Sebastian Borgeaud, Jean-Baptiste Alayrac, Jiahui Yu, Radu Soricut, Johan Schalkwyk, Andrew M. Dai,..., **Hoang Nguyen**,...
Technical report. Retrieved from <https://arxiv.org/pdf/2403.05530>

[O2]* "Gemini 2.5: Pushing the Frontier with Advanced Reasoning, Multimodality, Long Context, and Next Generation Agentic Capabilities".

Gheorghe Comanici, Eric Bieber, Mike Schaekermann, Ice Pasupat, Noveen Sachdeva, Inderjit Dhillon,..., **Hoang Nguyen**,...
Technical report. Retrieved from <https://arxiv.org/abs/2507.06261>

[O3] "Stochastic Constrained Decentralized Optimization for Machine Learning with Fewer Data Oracles: a Gradient Sliding Approach".

Hoang Huy Nguyen, Yan Li, Tuo Zhao

Technical report. Retrieved from <https://arxiv.org/abs/2404.02511>

* indicates the research was conducted during the internship at Google DeepMind in 2024 and 2025. -

Patents

[T1]* "Neuro-Symbolic For Solving Reasoning Tasks"

Trieu Trinh, Yuri Chervonyi, Xiaomeng Yang, Mirek Olsak, **Hoang Nguyen**, Junehyuk Jung, Thang Luong, Quoc Le
Filed.

* indicates the research was conducted during the internship at Google DeepMind in 2024. -

Research Experience

Georgia Institute of Technology

Graduate Research Assistant

Atlanta, GA
May. 2022 – Present

Advisor: Professor Siva Theja Maguluri

- Developing finite-time convergence bounds for Stochastic Approximation methods.
- Developing finite-time convergence to stationarity bounds for queuing systems.

Industry Experience

Google DeepMind

Student Researcher

Mountain View, CA
May. 2024 - Dec. 2024
Jun. 2025 - Aug. 2025

- Developed heuristics models and test-time algorithms for LLMs to solve Math Olympiad problems.
- Developed test-time heuristics algorithms and benchmarks for AlphaGeometry 2.0.
- Created an internal IMO benchmark for evaluating models.
- Our team won a Silver Medal at [IMO 2024](#) and a Gold Medal at [IMO 2025](#). Our work is highlighted in [M7], [M8] and [M9].

VinAI Research

AI Resident

Hanoi, Vietnam
Jul. 2020 – Jul. 2021

- Researched Domain Adaptation methods via Optimal Transport and computational methods for Optimal Transport.
- Took mandatory courses in advanced Computer Vision and Machine Learning theory.

TIKI Corporation

Data Scientist

Ho Chi Minh City, Vietnam
Mar. 2019 - Aug. 2020

- Researched and implemented adult content detection solutions with 98% accuracy.
- Researched and developed early buy box algorithms for TIKI. Employed multi-armed bandits models to bring personalized offers to customers.

Teaching Experience

Georgia Institute of Technology

Graduate Teaching Assistant

Atlanta, GA
Aug. 2021 – Dec. 2022

- Worked as Graduate Teaching Assistant for ISyE 3133 (Engineering Optimization) in Fall 2021, ISyE 2027 (Probability with Applications) in Spring 2022, ISyE 4803 (Online Learning) in Fall 2022, and ISyE 8803 (Modern Tools in Probability and Stochastic Processes) in Fall 2025.

Vietnam National Olympiad team

Math Olympiad trainer

- Trained the Vietnamese IMO 2021 team on Combinatorial Geometry.

Hanoi, Vietnam
May 2021 – June 2021

Minerva University

Teaching Assistant

- Hosted office hours and wrote solutions to weekly assignments for NS110L (Physics of Life) and B111 (Financial planning, budgeting & modeling) class.

San Francisco, CA
Sept. 2017 – Jan. 2019

Saudi Arabia National Olympiad team

Math Olympiad trainer, curriculum developer

- Taught 30 students from three different levels of math olympiad of the Saudi Arabia national team for the Balkan Mathematical Olympiad and International Mathematical Olympiad 2016.

Thuwal, Saudi Arabia
Apr. 2016 - May 2016

Awards and Fellowships

• IBM Ph.D. Fellowship Award		Jan. 2026
• ACM SIGMETRICS Student Research Contest 2025	Second Prize	Jun. 2025
• ARC-ACO Fellowship Award		Nov. 2023
• Stewart Topper Fellowship Award		Feb. 2021
• University Physics Modeling Contest	Silver Medal	Nov. 2017
• Interdisciplinary Contest in Modeling	Honorable Mention	Jan. 2017
• Le Van Thiem national award for young mathematicians		Mar. 2016
• Way to Olympia Peak academic game show broadcasted by VTV	Finalist	Aug. 2015
• International Mathematical Olympiad	Silver Medal	Jul. 2015
• Sharygin All-Russian Geometry Olympiad	Third-Prize	Aug. 2013
• Asia-Pacific Mathematical Olympiad for Primary Schools	Platinum Prize	May. 2010
• Vietnam's Brainiest Kid academic game show broadcasted by HTV	Champion	Aug. 2008

Invited Talks

- [5] "Discrete Markov Chain Mixing Analysis: a Bakry-Emery Approach"
- IOE Rising Star Workshop, University of Michigan, March 27th, 2026.
- [4] "Gold-medalist Performance in Solving Olympiad Geometry with AlphaGeometry2"
- Seminar at Virginia Tech, hosted by Prof. Sajad Khodadadian on April 25th 2025
 - INFORMS APS Conference 2025, Atlanta, Georgia.
 - INFORMS Annual Meeting 2025, Atlanta, Georgia.
 - Georgia Tech ACO Student Seminar Fall 2025, Atlanta, Georgia.
 - Seminar at Texas A&M University, hosted by Prof. Binh Minh Tran on September 8th 2025
 - INFORMS Annual Meeting 2025, Atlanta, Georgia.
 - ACC Invited Research Showcase at Purdue University on March 24th 2026.
- [3] "Finite-Time Behavior of M/M/n Queue: Mixing Time, Mean Queue Length and Tail Bounds"
- INFORMS Annual Meeting 2024, Seattle, Washington.
 - Georgia Tech ACO Student Seminar Spring 2025, Atlanta, Georgia.
 - Decision and Controls Laboratory (DCL) Student Symposium, 2025, Georgia Tech.
 - ACM SIGMETRICS 2025, Long Island, New York.
 - IISE Annual Conference 2025, Atlanta, Georgia.
 - INFORMS APS Conference 2025, Atlanta, Georgia.
 - Seminar at the University of Wisconsin-Madison on March 5th, 2026.
 - OM Rookiepaloosa, Kellogg School of Management, Northwestern University, April 22nd-23rd, 2026.
- [2] "Stochastic Approximation for Nonlinear Discrete Stochastic Control: Finite-Sample Bounds"
- Decision and Controls Laboratory (DCL) Student Symposium, 2024, Georgia Tech.
 - IEEE CDC 2023, Singapore.
 - ISyE Student Seminar, 2023, Georgia Tech.
- [1] "On Unbalanced Optimal Transport: Gradient Methods, Sparsity, and Approximation Error"
- Special Seminar: Decoding Computational Challenges, 2024, Advanced Institute of Interdisciplinary Science and Technology, Hochiminh City University of Technology
 - ISyE Student Seminar, 2022, Georgia Tech.

Services

a) Organizer and Program Committee

I served as the Audio and Visual Chair at APS 2025.

I served as a program committee member for

- AAAI Workshop MLmDS 2023: When Machine Learning meets Dynamical Systems: Theory and Applications.
- NeuRIPS MATH-AI Workshop on Mathematical Reasoning and AI 2024.
- ICLR Trustworthy AI Workshop 2026.

I served as an organizer of the *Vietnam Economics Olympiad* since its inaugural competition in 2021. Additionally, I also trained the Vietnamese national team in preparation for the International Economics Olympiad and co-authored [B2] to make the materials more accessible to Vietnamese high school students.

b) Reviewer

Conference:

- AISTATS (2022 - Present).
- ICLR (2024 - Present).
- ICML (2022 - Present).
- NeuRIPS (2022 - Present).
- IEEE CDC (2023 - Present).

Journal:

- IEEE Transactions on Neural Networks and Learning Systems (2022 - Present).
- IEEE Transactions on Networking (2024 - Present).
- IEEE Transactions on Automatic Control (2024 - Present).
- Journal of Machine Learning Research (2023 - Present).
- Journal of Optimization Theory and Applications (2023 - Present).
- Stochastic Processes and their Applications (2025 - Present).

c) Mentorship

Graduate mentee:

- Zedong Wang (Georgia Institute of Technology).

Undergraduate mentees:

- Huy Duc Pham (Hochiminh City University of Technology, first position: NCSU ISE Ph.D.).
- Dung Tuan Nguyen (Australian National University, first position: University of Pennsylvania CS Ph.D.).
 - Co-author on [P3], [P10].
- Duc Anh Nguyen (National University of Singapore).
 - Co-author on [P3].
 - *INFORMS 2024 Undergraduate Operations Research Prize recipient.*
- Bach Viet Vu (Hanoi University of Science and Technology).
 - Co-author on [P4].
- Son Hoang Pham (University of Massachusetts Amherst).
- Quang Dinh Thien Nguyen (Hochiminh City University of Information Technology).
- Co-author on [P10].
- Hien Gia Nguyen (Hanoi University of Education, first position: Texas A&M University Math Ph.D.).
- Khanh Minh Nguyen (University of Adelaide).
- Vinh Hien Pham (Georgia Institute of Technology).

High school mentees:

- Manh Nguyen Pham (HCMC-VNU High School for the Gifted → Minerva University)
 - Silver Medallist at IMO 2016.
- Son Hoang Pham (HCMC-VNU High School for the Gifted → University of Massachusetts Amherst).
 - Silver Medallist at IMO 2022.
- Danh Nguyen Thanh Tran (HCMC-VNU High School for the Gifted → National University of Singapore).
 - Bronze Medalist at IMO 2023.

Books

[B2] "Tuyển tập đề thi Olympic kinh tế Việt Nam và Quốc Tế" (Selected Vietnamese and International Economic Olympiad problems).

Vinh Anh Le, Tam Thanh Nguyen, **Hoang Huy Nguyen**, Hung Quoc Dang Ho, Hanh Phuong Hoang, Luan Van Vu, Diep Bich Nguyen, Trang Thi Ha Nguyen.

Nhà Xuất Bản Đại Học Quốc Gia Hà Nội (Vietnam National University Publishing House), 2024.

[B1] "Định hướng bồi dưỡng học sinh năng khiếu toán Hình học" (Advanced geometry problems for gifted students).

Vinh Anh Le, Hung Quang Tran, Linh Van Nguyen, **Hoang Huy Nguyen**, Lu Phuc Le, Quy Van Nguyen.

Nhà Xuất Bản Đại Học Quốc Gia Hà Nội (Vietnam National University Publishing House), 2016.

Media Recognition

[M9] [DeepMind AI crushes tough maths problems on par with top human solvers](#)

[M8] [AI achieves silver-medal standard solving International Mathematical Olympiad problems - Google DeepMind](#)

[M7] [New York Times: Move Over, Mathematicians, Here Comes AlphaProof](#)

[M6] [AI achieves silver-medal standard solving International Mathematical Olympiad problems](#)

[M5] [Chiến thắng nghệt thờ, nam sinh vào chung kết Olympia](#)

[M4] [Tinh thần quyết thắng của hơn 500 người trong 1 "nhà leo núi" | Báo Dân trí](#)

[M3] [Huy Hoàng: "Vào chung kết Đường lên đỉnh Olympia 2015 là một kỳ tích" | VTV.VN](#)

[M2] [\[CHUNG KẾT\] ĐƯỜNG LÊN ĐỈNH OLYMPIA 2015 | 16/08/2015](#)

[M1] [\[HTV7 / Chung kết "Tìm người thông minh - Vietnam Brainiest Kid" \(8/2008\)](#)

Skills and Hobbies

- Programming & scripting languages: Python, C++, R, SQL, HTML/CSS, LaTeX
- Language: Vietnamese (Native), English (Fluent).
- Hobbies: I love jogging and reading about History. I also enjoy traveling a lot and I have traveled to around 20 countries during my high school and undergraduate years.