Trang H. Tran

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(Updated September 17, 2022)

FIELDS OF INTEREST

Optimization, and Machine Learning/Deep Learning

EDUCATION

2020 – Present **School of Operations Research and Information Engineering, Cornell University**
Doctor of Philosophy, Major: Operations Research
PhD advisor: Prof. Katya Scheinberg
PhD co-advisor: Dr. Lam M. Nguyen

2019 – 2020 **Institute of Mathematics, Vietnam Academy of Science and Technology**
Graduate Study in Applied Mathematics (Dropped)

2015 – 2019 **Hanoi National University of Education**
Honor Class, Faculty of Mathematics
Degree of Bachelor, Classification: Excellent

RESEARCH EXPERIENCE

05/2023 – 08/2023 **AI Research Intern (upcoming)**
IBM Research, Thomas J. Watson Research Center, Yorktown Heights, NY
Supervisor: Dr. Lam M. Nguyen

05/2022 – 08/2022 **AI Research Intern**
IBM Research, Thomas J. Watson Research Center, Yorktown Heights, NY
Supervisor: Dr. Lam M. Nguyen

08/2021 – 05/2022 **Research Assistant**
Cornell University
Supervisor: Prof. Katya Scheinberg

PUBLICATIONS

2022 **Nesterov Accelerated Shuffling Gradient Method for Convex Optimization.**
Trang H. Tran, Katya Scheinberg, Lam M. Nguyen
International Conference on Machine Learning (**ICML 2022**) (21.9% acceptance rate)

2021 **SMG: A Shuffling Gradient-Based Method with Momentum**
Trang H. Tran, Lam M. Nguyen, Quoc Tran-Dinh
International Conference on Machine Learning (**ICML 2021**) (21.47% acceptance rate)

PREPRINTS

2022 **On the Convergence to a Global Solution of Shuffling-Type Gradient Algorithms**
Lam M. Nguyen*, **Trang H. Tran***
Technical report, arXiv preprint, 2022 *(Under Review)*

2022 **Finding Optimal Policy for Queueing Models: New Parameterization**
Trang H. Tran, Lam M. Nguyen, Katya Scheinberg
Technical report, arXiv preprint, 2022 *(Under Review)*

2022 **New Perspective on the Global Convergence of Finite-Sum Optimization**
Lam M. Nguyen*, **Trang H. Tran***, Marten van Dijk
Technical report, arXiv preprint, 2022 (*Under Review*)

PROFESSIONAL ACTIVITIES

02 – 2023 **Workshop Organizer**
When Machine Learning meets Dynamical Systems: Theory and Applications.
Lam M. Nguyen, **Trang H. Tran**, Wang Zhang, Subhro Das and Tsui-Wei Weng.
Workshop at the 37th Conference on Artificial Intelligence (AAAI 2023) (upcoming)

2020 – Present **Program Committee – Reviewer (peer-reviewed conferences)**
International Conference on Machine Learning (ICML 2020 - 2022)
Conference on Neural Information Processing Systems (NeurIPS 2021 - 2022)
International Conference on Learning Representations (ICLR 2021 - 2023)
Conference on Artificial Intelligence (AAAI 2022)
International Conference on Artificial Intelligence and Statistics (AISTATS 2021 - 2023)
Conference on Uncertainty in Artificial Intelligence (UAI 2022)

2021 – Present **Reviewer (peer-reviewed journal)**
Journal of Machine Learning Research (2022 – Present)
Journal of Optimization Theory and Applications (2022 – Present)
Machine Learning (2021 – Present)
Neural Networks (2022 – Present)
IEEE Transactions on Signal Processing (2021 – Present)
IEEE Transactions on Neural Networks and Learning Systems (2022 – Present)

2022 – Present **Member**
Editorial Board, Machine Learning Journal (upcoming)

2021 – Present **Session Chair / Organizer**
INFORMS Annual Meeting 2022 – "Optimization for Machine Learning" (upcoming)
INFORMS Annual Meeting 2021 – "Recent Advances in Stochastic Gradient Algorithms"

2021 **Program Committee – Reviewer (workshops)**
Optimization for Machine Learning: Beyond Worst-case Complexity (OPT 2021 – NeurIPS 2021 Workshop)
New Frontiers in Federated Learning: Privacy, Fairness, Robustness, Personalization and Data Ownership (NFFL 2021 – NeurIPS 2021 Workshop)

PATENTS APPLICATIONS

[1] **Training A Neural Network Using an Accelerated Gradient with Shuffling.**
Filed on July 14, 2022.
Lam M. Nguyen, **Trang H. Tran.**

HONORS & AWARDS

2022 **Top Reviewer**
Conference on Uncertainty in Artificial Intelligence (UAI 2022)

2021 **Outstanding Reviewer**
International Conference on Learning Representations (ICLR 2021)
Reviewer Award (Top 10%)

2020 **ORIE Field Fellowship**
Eleanor and Howard Morgan PhD'68 Graduate Fellowship, Fall 2020

2019 **Young Talent Scholarship Programme 2019**
From the Vingroup Innovation Foundation (VINIF) for outstanding students who are pursuing the domestic postgraduate study programmes

2016 – 2018 **Students Scholarship in National Program**
for the Development of Mathematics until 2020

2016 **First Prize on Algebra**
In Vietnam Mathematics Competition for University Students (nationwide award)

RESEARCH PROJECTS

2022 – Present **Adaptive Framework for Time Series: Forecasting with Missing Data**
Summer intern project at IBM - working under the supervision of Dr. Lam M. Nguyen
– Propose an adaptive multi-task framework for time series data, which simultaneously imputes the missing entries and makes a multiple-step ahead prediction.
– Perform experiments with our framework and show good performance of our method over existing approaches in both tasks.

2022 – Present **On the Convergence to a Global Solution of Shuffling-Type Gradient Algorithms**
Working under the supervision of Dr. Lam M. Nguyen
– Investigate a class of non-convex function called star-M-smooth-convex, which is more general than the class of star-convex smooth functions with respect to the minimizer (in the over-parameterized settings).
– Propose a new framework for the convergence of a shuffling-type gradient algorithm to a global solution, with a relaxed set of assumptions than the PL condition on the objective function.

2021 – Present **Nesterov Accelerated Shuffling Gradient Method for Convex Optimization**
Working under the supervision of Dr. Lam M. Nguyen and Prof. Katya Scheinberg
– Propose a new algorithm for the convex finite-sum problems, which integrates the traditional Nesterov's acceleration momentum with different shuffling sampling schemes.
– Prove an improved convergence rate in term of epochs, which is better than that of any other shuffling gradient methods in convex regime.
Published as a conference paper at ICML 2022

2020 – Present **Optimization for Queueing Models in Reinforcement Learning**
Working under the supervision of Prof. Katya Scheinberg and Dr. Lam M. Nguyen
– Investigate the optimization aspects of the queueing model as a Reinforcement Learning environment.
– Use the intrinsic properties of queueing network systems to optimize with probabilistic zeroth-order/first-order oracles

2020 – Present **New Perspective on the Global Convergence of Finite-Sum Optimization**
Working under the supervision of Dr. Lam M. Nguyen
– Present an alternative formulation for the finite-sum nonconvex optimization problems.
– Propose a novel framework that guarantees global convergence and exploits the structure of machine learning problems where the loss functions are convex.

2020 – 2021 **SMG: A Shuffling Gradient-Based Method with Momentum**
Working under the supervision of Dr. Lam M. Nguyen
– Develop a new shuffling gradient algorithm with momentum for solving the finite-sum minimization problems.
– Establish the state-of-the-art convergence rate for our method under standard assumptions using different learning rates and shuffling strategies.
Published as a conference paper at ICML 2021

TALKS

10/2022 **Nesterov Accelerated Shuffling Gradient Method.**
INFORMS Annual Meeting 2022, Indianapolis, IN (upcoming)

07/2022 **Nesterov Accelerated Shuffling Gradient Method for Convex Optimization.**
International Conference on Machine Learning (ICML 2022), Baltimore, MD

10/2021 Shuffling Gradient-Based Methods
INFORMS Annual Meeting 2021, Anaheim, CA

07/2021 SMG: A Shuffling Gradient-Based Method with Momentum
International Conference on Machine Learning (ICML 2021), virtual conference

OTHER EXPERIENCES

Teaching Assistant - Cornell University

Fall 2022 MATH 2940 Linear Algebra for Engineeers
Spring 2021 ORIE 3510 Introduction to Engineering Stochastic Processes
Holding discussion sections, grading and other duties.

Mentorship

06/2022 – 05/2023 Angelos Assos.
Undergraduate student, Computer Science and Mathematics, Massachusetts Institute of Technology. (co-advise with Dr. Lam Nguyen and Prof. Luca Daniel)

SKILLS

Technical Python, MATLAB, PyTorch, TensorFlow, Keras, Gurobi.
Language Vietnamese (native), English (proficient)

REFERENCES

Katya Scheinberg, Ph.D.

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School of Operations Research and Information Engineering, Cornell University
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Lam M. Nguyen, Ph.D.

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Marten van Dijk, Ph.D.

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Computer Security, Centrum Wiskunde & Informatica
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