Trang H. Tran

✉ htt27@cornell.edu · https://htt-trangtran.github.io

(Updated August 27, 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

05/2022 – 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

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 - 2022)
Conference on Artificial Intelligence (AAAI 2022)
International Conference on Artificial Intelligence and Statistics (AISTATS 2021 - 2022)
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 **Session Chair / Organizer**

INFORMS Annual Meeting 2022 – "Gradient Algorithms 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)

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

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)

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.

SKILLS

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

REFERENCES

Katya Scheinberg, Ph.D.

Professor,
School of Operations Research and Information Engineering, Cornell University
225 Frank H.T. Rhodes Hall, Ithaca, NY 14850, USA
✉ katyas@cornell.edu ☎ +1 (607) 255-1525
https://www.orie.cornell.edu/faculty-directory/katya-scheinberg

Lam M. Nguyen, Ph.D.

Research Staff Member,
IBM Research, Thomas J. Watson Research Center
1101 Kitchawan Rd, Yorktown Heights, NY 10598, USA
✉ lamnguyen.mltd@ibm.com ☎ +1 (469) 834-7021
https://researcher.watson.ibm.com/researcher/view.php?person=ibm-lamnguyen.mltd

Marten van Dijk, Ph.D.

Group Leader, Scientific Staff Member,
Computer Security, Centrum Wiskunde & Informatica
L312 Science Park 123, 1098 XG Amsterdam, NETHERLANDS
✉ marten.van.dijk@cwi.nl ☎ +31 20 592 4066
https://www.cwi.nl/people/marten-van-dijk

Quoc Tran-Dinh, Ph.D.

Associate Professor,
Department of Statistics and Operations Research, The University of North Carolina at Chapel Hill
333 Hanes Hall, Chapel Hill, NC 27599, USA
✉ quoctd@email.unc.edu ☎ +1 (919) 843-6023
https://quoctd.web.unc.edu