

# Trang H. Tran

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(Updated October 28, 2023)

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## FIELDS OF INTEREST

Optimization and Time Series Application in Machine Learning

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## EDUCATION

2020 – Present [School of Operations Research and Information Engineering, Cornell University](#)

PhD Candidate, Major: Operations Research

Advisor: Prof. Katya Scheinberg. Co-advisor: Dr. Lam M. Nguyen

**Degree of Master of Science.**

2015 – 2019 [Hanoi National University of Education](#)

Honor Class, Faculty of Mathematics

**Degree of Bachelor.** Classification: Excellent

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## RESEARCH EXPERIENCE

05/2023 – 08/2023 [AI Research Intern](#)

IBM Research, Thomas J. Watson Research Center, Yorktown Heights, NY

Supervisors: Dr. Lam M. Nguyen, Dr. Kyongmin Yeo, Dr. Nam H. Nguyen

05/2022 – 08/2022 [AI Research Intern](#)

IBM Research, Thomas J. Watson Research Center, Yorktown Heights, NY

Supervisor: Dr. Lam M. Nguyen

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## PUBLICATIONS

2023 [On the Convergence to a Global Solution of Shuffling-Type Gradient Algorithms](#)

Lam M. Nguyen\*, **Trang H. Tran**\*

Conference on Neural Information Processing Systems (**NeurIPS 2023**) (26.1% acceptance rate)

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)

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## PEER-REVIEWED WORKSHOP PAPERS

2023 [Stochastic FISTA Step Search Algorithm for Convex Optimization](#)

**Trang H. Tran**, Lam M. Nguyen, Katya Scheinberg

Conference on Neural Information Processing Systems (**NeurIPS 2023**),  
Workshop on Optimization for Machine Learning (**OPT 2023**)

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## PREPRINTS

2023 [Learning Robust and Consistent Time Series Representations: A Dilated Inception-Based Approach](#)

Anh Duy Nguyen, **Trang H. Tran**, Hieu H. Pham, Phi Le Nguyen, Lam M. Nguyen

Technical report, arXiv preprint, 2023 (*Under Review*)

- 2023 [An End-to-End Time Series Model for Simultaneous Imputation and Forecast](#)  
**Trang H. Tran**, Lam M. Nguyen, Kyongmin Yeo, Nam Nguyen, Dzung Phan, Roman Vaculin, Jayant Kalagnanam  
 Technical report, arXiv preprint, 2023 (*Under Review*)
- 2022 [Finding Optimal Policy for Queueing Models: New Parameterization](#)  
**Trang H. Tran**, Lam M. Nguyen, Katya Scheinberg  
 Technical report, arXiv preprint, 2022
- 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*)

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## WORKING PAPERS

- 2023 [Stochastic FISTA Step Search Algorithm for Convex Optimization](#)  
**Trang H. Tran**, Lam M. Nguyen, Katya Scheinberg  
 A workshop version of this paper is accepted at **OPT 2023** (Workshop on Optimization for Machine Learning, NeurIPS 2023)
- 2023 [A Univariate Pretrain-Finetune Approach for Time Series Using Supervised Contrastive Learning](#)  
**Trang H. Tran**, Lam M. Nguyen, Kyongmin Yeo, Nam Nguyen, Roman Vaculin

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## 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)
- 2020 – Present [Program Committee – Reviewer \(peer-reviewed conferences\)](#)  
 International Conference on Machine Learning (ICML 2020 - 2023)  
 Conference on Neural Information Processing Systems (NeurIPS 2021 - 2023)  
 International Conference on Learning Representations (ICLR 2021 - 2024)  
 Conference on Artificial Intelligence (AAAI 2022)  
 International Conference on Artificial Intelligence and Statistics (AISTATS 2021 - 2024)  
 Conference on Uncertainty in Artificial Intelligence (UAI 2022 - 2023)  
 Conference on Computer Vision and Pattern Recognition (CVPR 2023)
- 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
- 2021 – Present [Session Chair / Organizer](#)  
 INFORMS Annual Meeting 2023 – "First-Order Methods for Machine Learning"  
 INFORMS Annual Meeting 2022 – "Optimization for Machine Learning"  
 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)

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PATENTS APPLICATIONS

[3] [A Multivariate Time Series Model Which Simultaneously Learns The Spatial And Temporal Relation.](#)

To be filed.

Lam M. Nguyen, **Trang H. Tran.**

[2] [Time Series Forecasting Using Multivariate Time Series Data With Missing Values.](#)

Filed on February 1st, 2023.

Lam M. Nguyen, **Trang H. Tran**, Kyongmin Yeo, Nam Nguyen, Dzung Phan, Roman Vaculin, Jayant Kalagnanam.

[1] [Training A Neural Network Using an Accelerated Gradient with Shuffling.](#)

Filed on July 14th, 2022.

Lam M. Nguyen, **Trang H. Tran.**

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HONORS & AWARDS

2023 [NeurIPS 2023 Scholar Award](#)

Conference on Neural Information Processing Systems (NeurIPS 2023) (Travel Grant)

2022 [Top Reviewer](#)

Conference on Uncertainty in Artificial Intelligence (UAI 2022)

2022 [ICML 2022 Participation Grant](#)

International Conference on Machine Learning (ICML 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)

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RESEARCH PROJECTS

2023 – Present [Foundation Model for Time Series Study](#)

*Summer intern project at IBM - working under the supervision of Dr. Lam M. Nguyen, Dr. Kyongmin Yeo and Dr. Nam H. Nguyen*

– Propose a pre-training data processing procedure to build a diverse pool of time series representation learning.

– Propose a contrastive learning approach to pretrain and finetune the time series datasets.

- 2022 – Present [Stochastic FISTA Algorithm for Convex Optimization](#)  
*Working under the supervision of Dr. Lam M. Nguyen and Prof. Katya Scheinberg*  
 – Propose a new algorithm with fast iterative shrinkage-thresholding (FISTA) to solve the stochastic convex optimization problem, which integrates the acceleration of FISTA step with a framework that searches for descent directions.  
 – Our complexity matches with the iteration complexity of deterministic Nesterov’s accelerated momentum and FISTA algorithm, which is optimal in convex setting.
- 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 – 2023 [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 – 2022 [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 – 2022 [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 – 2022 [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*

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## TALKS

- 10/2023 [Stochastic Optimization Methods with Momentum.](#)  
 INFORMS Annual Meeting 2023, Phoenix, AZ
- 01/2023 [Shuffling Gradient Methods for Finite-sum Optimization.](#)  
 Institute of Mathematics, Vietnam Academy of Science and Technology, Hanoi, Vietnam

- 10/2022 [Nesterov Accelerated Shuffling Gradient Method](#).  
INFORMS Annual Meeting 2022, Indianapolis, IN
- 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

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## OTHER EXPERIENCES

### [Teaching Assistant - Cornell University](#)

- Fall 2022 MATH 2940 Linear Algebra for Engineers  
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)

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## GRADUATE COURSEWORK AT CORNELL UNIVERSITY

- [ORIE 6300](#) Mathematical Programming (Linear and Non-linear Optimization)  
[ORIE 6500](#) Statistical Principles  
[ORIE 6700](#) Applied Stochastic Processes  
[ORIE 6590](#) Approximate Dynamic Programming and Reinforcement Learning  
[ORIE 7190](#) Selected Topics in Applied Operation Researchs  
[CS 6820](#) Analysis of Algorithms  
[ORIE 7391](#) Selected Topics in Mathematical Programming (Integer Programming)  
[CS 6241](#) Data Science Numerics  
[ORIE 6580](#) Simulation

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## SKILLS

- [Programming](#) Python, MATLAB, PyTorch, TensorFlow, Keras, CPLEX, Gurobi.  
[Research](#) Optimization, Machine Learning, Time Series Analysis, Mathematical Modelling.  
[Language](#) Vietnamese (native), English (proficient)

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## REFERENCES

Katya Scheinberg, Ph.D.

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<https://www.orie.cornell.edu/faculty-directory/katya-scheinberg>

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<https://researcher.watson.ibm.com/researcher/view.php?person=ibm-lamnguyen.mltd>

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