# Lam M. Nguyen

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# (Updated on 06/11/2021)

EDI	A TI	ON
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2014 - 2018	<b>Ph.D.</b> , Department of Industrial and Systems Engineering, <i>Lehigh University</i> ,
	Bethlehem, PA
	Thesis advisors: Katya Scheinberg, Martin Takac, and Alexander L. Stolyar
	Thesis title: A Service System with On-Demand Agents, Stochastic Gradient
	Algorithms and the SARAH Algorithm
	Elizabeth V. Stout Dissertation Award
	Research areas: Optimization for Large Scale Problems, Machine Learning, Deep
	Learning, Stochastic Models, Optimal Control
2011 - 2013	M.B.A., College of Business, McNeese State University, Lake Charles, LA
	Beta Gamma Sigma (Academic Honor)
2004 - 2008	<b>B.S.</b> , Applied Mathematics and Computer Science, Faculty of Computational
	Mathematics and Cybernetics, Lomonosov Moscow State University, Moscow, Russia
	Thesis advisor: Vladimir I. Dmitriev
	Thesis title: Methods for Detecting Hidden Period in Some Economics Processes

## RESEARCH EXPERIENCE

04/2021 - Present	Research Staff Member, IBM Thomas J. Watson Research Center, Yorktown
	Heights, NY
	Research areas: Optimization, Machine Learning, Explainable AI
10/2018 - 03/2021	Research Scientist, IBM Thomas J. Watson Research Center, Yorktown Heights, NY
	Research areas: Optimization, Machine Learning, Deep Learning, Reinforcement
	Learning, AI Solutions, Explainable AI
05/2018 - 08/2018	Research Intern, IBM Thomas J. Watson Research Center, Yorktown Heights, NY
	Research areas: Optimization, Machine Learning, Deep Learning, Reinforcement
	Learning
08/2017 - 05/2018	Research Co-op, IBM Thomas J. Watson Research Center, Yorktown Heights, NY
	Research areas: Optimization, Machine Learning, Deep Learning
06/2017 - 08/2017	Research Intern, IBM Thomas J. Watson Research Center, Yorktown Heights, NY
	Research areas: Optimization, Machine Learning, Deep Learning
09/2014 - 05/2017	Research Assistant, Lehigh University, Bethlehem, PA
	Research areas: Optimization for Large Scale Problems, Machine Learning, Deep
	Learning, Stochastic Models, Optimal Control
01/2012 - 12/2013	Graduate (Research) Assistant, McNeese State University, Lake Charles, LA
	Research areas: Operations Management and Finance

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[21] SMG: A Shuffling Gradient-Based Method with Momentum. Trang H. Tran, Lam M. Nguyen, Quoc Tran-Dinh The 38th International Conference on Machine Learning (ICML 2021), 2021 (21.47% acceptance rate) [20] Regression Optimization for System-level Production Control. Dzung T. Phan, Lam M. Nguyen, Pavankumar Murali, Nhan H. Pham, Hongsheng Liu, Jayant R. Kalagnanam The 2021 American Control Conference (ACC 2021), 2021 [19] Hogwild! over Distributed Local Data Sets with Linearly Increasing Mini-Batch Sizes. Nhuong V. Nguyen, Toan N. Nguyen, Phuong Ha Nguyen, Quoc Tran-Dinh, Lam M. Nguyen, Marten van Dijk The 24th International Conference on Artificial Intelligence and Statistics (AISTATS **2021**), 2021 (29.8% acceptance rate) A Hybrid Stochastic Optimization Framework for Stochastic Composite Nonconvex [18] Optimization. Quoc Tran-Dinh, Nhan H. Pham, Dzung T. Phan, Lam M. Nguyen Mathematical Programming (MAPR), 2021 Hybrid Variance-Reduced SGD Algorithms for Nonconvex-Concave Minimax [17] Problems. Quoc Tran-Dinh, Deyi Liu, Lam M. Nguyen The 34th Conference on Neural Information Processing Systems (NeurIPS 2020), 2020 (20.1% acceptance rate) [16] A Scalable MIP-based Method for Learning Optimal Multivariate Decision Trees. Haoran Zhu, Pavankumar Murali, Dzung T. Phan, Lam M. Nguyen, Jayant R. Kalagnanam The 34th Conference on Neural Information Processing Systems (NeurIPS 2020), 2020 (20.1% acceptance rate) [15] Inexact SARAH Algorithm for Stochastic Optimization. Lam M. Nguyen, Katya Scheinberg, Martin Takac Optimization Methods and Software (GOMS), volume 36(1), 237-258, 2020 [14] Pruning Deep Neural Networks with L0-constrained Optimization. Dzung T. Phan, Lam M. Nguyen, Nam H. Nguyen, Jayant R. Kalagnanam The 20th IEEE International Conference on Data Mining (ICDM 2020), 2020 (19.7% acceptance rate) [13] Stochastic Gauss-Newton Algorithms for Nonconvex Compositional Optimization. Ouoc Tran-Dinh, Nhan H. Pham, Lam M. Nguven The 37th International Conference on Machine Learning (ICML 2020), PMLR 119, 2020 (21.8% acceptance rate)

[12]	ProxSARAH: An Efficient Algorithmic Framework for Stochastic Composite
	Nonconvex Optimization.
	Nhan H. Pham, Lam M. Nguyen, Dzung T. Phan, Quoc Tran-Dinh
F1.13	Journal of Machine Learning Research (JMLR), volume 21(110), 1-48, 2020
[11]	A Hybrid Stochastic Policy Gradient Algorithm for Reinforcement Learning.
	Nhan H. Pham, Lam M. Nguyen, Dzung T. Phan, Phuong Ha Nguyen, Marten van
	Dijk, Quoc Tran-Dinh
	The 23rd International Conference on Artificial Intelligence and Statistics (AISTATS
[10]	2020), PMLR 108, 2020
[10]	New Convergence Aspects of Stochastic Gradient Algorithms.  Lem M. Navyen, Physical Description of Stochastic Gradient Algorithms.
	Lam M. Nguyen, Phuong Ha Nguyen, Peter Richtarik, Katya Scheinberg, Martin
	Takac, Marten van Dijk
[0]	Journal of Machine Learning Research (JMLR), volume 20(176), 1-49, 2019
[9]	Tight Dimension Independent Lower Bound on the Expected Convergence Rate for
	Diminishing Step Sizes in SGD.
	Phuong Ha Nguyen, Lam M. Nguyen, Marten van Dijk
	The 33th Conference on Neural Information Processing Systems (NeurIPS 2019),
503	2019 (21.17% acceptance rate)
[8]	PROVEN: Verifying Robustness of Neural Networks with a Probabilistic Approach.
	Tsui-Wei Weng, Pin-Yu Chen*, Lam M. Nguyen*, Mark S. Squillante*, Akhilan
	Boopathy, Ivan Oseledets, Luca Daniel
	The 36th International Conference on Machine Learning (ICML 2019), PMLR 97,
	2019 (22.5% acceptance rate)
[7]	Characterization of Convex Objective Functions and Optimal Expected Convergence
	Rates for SGD.
	Marten van Dijk, <b>Lam M. Nguyen</b> , Phuong Ha Nguyen, Dzung T. Phan
	The 36th International Conference on Machine Learning (ICML 2019), PMLR 97,
	2019 (22.5% acceptance rate)
[6]	ChieF: A Change Pattern based Interpretable Failure Analyzer.
	Dhaval Patel, Lam M. Nguyen, Akshay Rangamani, Shrey Shrivastava, Jayant
	Kalagnanam
	2018 IEEE International Conference on Big Data (IEEE BigData 2018), 2018
[5]	SGD and Hogwild! Convergence Without the Bounded Gradients Assumption.
	Lam M. Nguyen, Phuong Ha Nguyen, Marten van Dijk, Peter Richtarik, Katya
	Scheinberg, Martin Takac
	The 35th International Conference on Machine Learning (ICML 2018), PMLR 80,
	2018 (25% acceptance rate)
	IBM Research AI – Selected Publications 2018
[4]	SARAH: A Novel Method for Machine Learning Problems Using Stochastic
	Recursive Gradient.

Lam M. Nguyen, Jie Liu, Katya Scheinberg, Martin Takac

The 34th International Conference on Machine Learning (ICML 2017), PMLR

70:2613-2621, 2017 (25% acceptance rate)

Van Hoesen Family Best Publication Award

[3] A Queueing System with On-demand Servers: Local Stability of Fluid Limits.

Lam M. Nguyen, Alexander L. Stolyar

Queueing Systems (QUESTA), 1-26, Springer, 2017

[2] A Service System with Randomly Behaving On-demand Agents.

Lam M. Nguyen, Alexander L. Stolyar

The 42nd International Conference on Measurement and Modeling of Computer Systems (SIGMETRICS 2016), ACM SIGMETRICS Performance Evaluation

Review, 44(1):365-366, 2016 (25% acceptance rate)

[1] <u>CEO Compensation: Does Financial Crisis Matter?</u>

Prasad Vemala, Lam Nguyen, Dung Nguyen, Alekhya Kommasani

International Business Research, 7(4):125-131, 2014

#### **PREPRINTS**

[12] <u>Federated Learning with Randomized Douglas-Rachford Splitting Methods.</u>

Nhan H. Pham, Lam M. Nguyen, Dzung T. Phan, Quoc Tran-Dinh

Technical report, arXiv preprint, 2021

[11] Differential Private Hogwild! over Distributed Local Data Sets.

Marten van Dijk, Nhuong V. Nguyen, Toan N. Nguyen, Lam M. Nguyen, Phuong Ha

Nguyen

Technical report, arXiv preprint, 2021

[10] An Optimal Hybrid Variance-Reduced Algorithm for Stochastic Composite

Nonconvex Optimization.

Deyi Liu, Lam M. Nguyen, Quoc Tran-Dinh

Technical report, arXiv preprint, 2020

[9] Asynchronous Federated Learning with Reduced Number of Rounds and with

Differential Privacy from Less Aggregated Gaussian Noise.

Marten van Dijk, Nhuong V. Nguyen, Toan N. Nguyen, Lam M. Nguyen, Quoc

Tran-Dinh, Phuong Ha Nguyen

Technical report, arXiv preprint, 2020

[8] Finite-Time Analysis of Stochastic Gradient Descent under Markov Randomness.

Thinh T. Doan, Lam M. Nguyen, Nhan H. Pham, Justin Romberg

Technical report, arXiv preprint, 2020

[7] A Unified Convergence Analysis for Shuffling-Type Gradient Methods.

Lam M. Nguyen, Quoc Tran-Dinh, Dzung T. Phan, Phuong Ha Nguyen, Marten van

Dijk

Technical report, arXiv preprint, 2020

[6] Convergence Rates of Accelerated Markov Gradient Descent with Applications in Reinforcement Learning. Thinh T. Doan, Lam M. Nguyen, Nhan H. Pham, Justin Romberg Technical report, arXiv preprint, 2020 Buffer Zone based Defense against Adversarial Examples in Image Classification. [5] Kaleel Mahmood\*, Phuong Ha Nguyen\*, Lam M. Nguyen, Thanh Nguyen, Marten van Dijk Technical report, arXiv preprint, 2019 Hybrid Stochastic Gradient Descent Algorithms for Stochastic Nonconvex [4] Optimization. Quoc Tran-Dinh, Nhan H. Pham, Dzung T. Phan, Lam M. Nguven Technical report, arXiv preprint, 2019 [3] Finite-Sum Smooth Optimization with SARAH. Lam M. Nguyen, Marten van Dijk, Dzung T. Phan, Phuong Ha Nguyen, Tsui-Wei Weng, Jayant R. Kalagnanam Technical report, arXiv preprint, 2019 [2] When Does Stochastic Gradient Algorithm Work Well? Lam M. Nguyen, Nam H. Nguyen, Dzung T. Phan, Jayant R. Kalagnanam, Katya Scheinberg Technical report, arXiv preprint, 2018 Stochastic Recursive Gradient Algorithm for Nonconvex Optimization. [1] Lam M. Nguyen, Jie Liu, Katya Scheinberg, Martin Takac Technical report, arXiv preprint, 2017 PATENT APPLICATIONS A Method and System for Kernel Multi-Polytope Machine for Classification. [16] (Pending). To be filed Dzung T. Phan, Lam M. Nguyen, Jayant R. Kalagnanam, Chandrasekhara K. Reddy, Srideepika Jayaraman [15] Method and System of Layer and Component Oriented Optimization Flexible and Pluggable Architecture for Asset Management Platform. (Pending). To be filed Nianjun Zhou, Pavankumar Murali, Dzung T. Phan, Lam M. Nguyen [14] System and Method for unsupervised Learning of Semantic Graph from textual data and language generation from Semantic grapH via Reinforcement learning. (Pending). To be filed Hoang Thanh Lam, Dzung T. Phan, Gabriele Picco, Lam Minh Nguyen, Marco Luca Sbodio, Vanessa Lopez Garcia [13] Method, Apparatus, and System of Dynamic Asset Management Optimization with Integration of Asset Failure and Asset Health Prediction Change. (Pending). To be filed

	Nianjun Zhou, Dzung T. Phan, Pavankumar Murali, Lam M. Nguyen
[12]	An End-to-End Model for Training Decision Trees with Dimension Reduction.
	(Pending). To be filed
	Dzung T. Phan, Michael Huang, Pavankumar Murali, Lam M. Nguyen
[11]	Method for Reasonable Matching Learning. (Pending). To be filed
	Hoang Thanh Lam, Dzung T. Phan, Gabriele Picco, Lam M. Nguyen, Vanessa Lopez
	Garcia
[10]	A Method and System for Performing Distributed Training of Large-Scale Deep
	Neural Networks and Machine Learning Models. (Pending). To be filed
	Lam M. Nguyen, Dung Tien Phan, Jayant R. Kalagnanam
[9]	Site-Wide Optimization for Mixed Regression Models and Mixed Control Variables.
	(Pending). Filed on May 25, 2021
	Dung Tien Phan, Nhan H. Pham, Lam M. Nguyen
[8]	A Shuffling-Type Gradient Method for Training Machine Learning models with Big
	Data. Filed on December 01, 2020
	Lam M. Nguyen, Dung Tien Phan
[7]	Site-wide Operations Management Optimization for Manufacturing and Processing
	Control. Filed on August 20, 2020
	Dung Tien Phan, Lam M. Nguyen, Pavankumar Murali, and Hongsheng Liu
[6]	System-level Control using Tree-based Regression with Outlier Removal. Filed on
	August 20, 2020
	Dung Tien Phan, Pavankumar Murali, Lam M. Nguyen
[5]	A Method for Tuning Hyper-Parameters for Classification. Filed on July 27, 2020
	Dung Tien Phan, Hongsheng Liu, Lam M. Nguyen
[4]	A Method and System for Automated Generation of Optimization Model for System-
	Wide Plant Optimization. Filed on July 24, 2020
	Dung Tien Phan, Lam M. Nguyen, Pavankumar Murali, Nianjun Zhou
[3]	System and Method for Quality Mode Prediction in Manufacturing and Process
	Industries. Filed on February 20, 2020
	Pavankumar Murali, Haoran Zhu, Dung Tien Phan, Lam M. Nguyen.
[2]	Prediction Optimization for System-level Production Control. Filed on July 23, 2019
	Dzung T. Phan, <b>Lam M. Nguyen</b> , Pavankumar Murali, Jayant R. Kalagnanam
[1]	Compression of Deep Neural Networks. Filed on March 13, 2019. US Patent
	Application 20200293876
	Dzung T. Phan, Lam M. Nguyen, Nam H. Nguyen, Jayant R. Kalagnanam
THESES	

## **THESES**

2018 A Service System with On-Demand Agents, Stochastic Gradient Algorithms and the SARAH Algorithm.

Lam M. Nguyen

PhD dissertation, Lehigh University, Bethlehem, PA

Elizabeth V. Stout Dissertation Award

2008 Methods for Detecting Hidden Period in Some Economics Processes.

Lam M. Nguyen

Undergraduate thesis, Lomonosov Moscow State University, Moscow, Russia

#### **INVITED TALKS**

INVITED TALKS	
11/2020	A Unified Convergence Analysis for Shuffling-Type Gradient Methods.
	INFORMS Annual Meeting, Virtual Conference
10/2019	Finite-Sum Smooth Optimization with SARAH.
	INFORMS Annual Meeting, Seattle, WA
11/2018	Inexact SARAH for Solving Stochastic Optimization Problems.
	INFORMS Annual Meeting, Phoenix, AZ
08/2018	Inexact SARAH for Solving Stochastic Optimization Problems.
	DIMACS/TRIPODS/MOPTA, Bethlehem, PA
03/2018	When does stochastic gradient algorithm work well?
	INFORMS Optimization Society Conference, Denver, CO
10/2017	SARAH: Stochastic recursive gradient algorithm.
	INFORMS Annual Meeting, Houston, TX
08/2017	SARAH algorithm.
	IBM Thomas J. Watson Research Center, Yorktown Heights, NY
11/2016	A queueing system with on-demand servers: local stability of fluid limits.
	INFORMS Annual Meeting, Nashville, TN
08/2016	A queueing system with on-demand servers: local stability of fluid limits.
	Modeling and Optimization: Theory and Applications, Bethlehem, PA
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#### **PROFESSIONAL ACTIVITIES**

2020 – 2021 2021 2021	Senior Program Committee – Area Chair (peer-reviewed conferences) International Conference on Machine Learning ( <i>ICML</i> ) International Conference on Learning Representations ( <i>ICLR</i> ) International Conference on Artificial Intelligence and Statistics ( <i>AISTATS</i> )
	Program Committee – Reviewer (peer-reviewed conferences)
2017 - 2019	International Conference on Machine Learning (ICML)
2017 - 2021	Conference on Neural Information Processing Systems (NIPS/NeurIPS)
2018 - 2020	International Conference on Learning Representations (ICLR)
2019 - 2020	International Conference on Artificial Intelligence and Statistics (AISTATS)
2021	Conference on Learning Theory (COLT)
2019 - 2021	AAAI Conference on Artificial Intelligence (AAAI)
2020	International Joint Conferences on Artificial Intelligence (IJCAI)

2019 – 2021	IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)
2019 - 2021	IEEE International Conference on Computer Vision (ICCV)
2020	European Conference on Computer Vision (ECCV)
2019 - 2021	Conference on Uncertainty in Artificial Intelligence (UAI)
	Reviewer (peer-reviewed journals)
2018 – 2021	
2018 – 2021 2020	Journal of Machine Learning Research  Mathematical Programming
2020 – 2021	Mathematical Programming
	SIAM Journal on Numerical Analysis
2021 2020 – 2021	SIAM Journal on Numerical Analysis
2020 - 2021 $2019 - 2020$	IEEE Transactions on Neural Networks and Learning Systems
	IEEE Transactions on Signal Processing
2019 2018	Artificial Intelligence Optimization Methods and Software
	Optimization Methods and Software SIAM Journal on Mathematics of Data Science
2020	SIAM Journal on Mathematics of Data Science
	Member
2020 - Present	Editorial Board, Journal of Machine Learning Research
2020	<b>Program Committee</b> , Optimization for Machine Learning (OPT 2020), NeurIPS
	2020 Workshop
2018	Program Committee, "Modern Trends in Nonconvex Optimization for Machine
	Learning", ICML 2018 Workshop
	Session Chair / Organizer (conferences)
2021	Oral Session, ICLR 2021
2021	Session "Theory and Practice of Machine Learning", AISTATS 2021
2020	Session "Recent Advances in Stochastic Gradient Algorithms for Machine Learning
	Applications", INFORMS Annual Meeting 2020
2019	Session "Fast and Provable Nonconvex Optimization Algorithms in Machine
	Learning", INFORMS Annual Meeting 2019
2018	Session "Recent Advances in Optimization Methods for Machine Learning",
	INFORMS Annual Meeting 2018
2018	Sessions "Sparse Optimization" and "Stochastic Gradient Descent",
	DIMACS/TRIPODS/MOPTA 2018
	Others
2020	Reviewer, IBM Ph.D. Fellowships
2020	Actional, abin 1 in.D. 1 chowships

## PROFESSIONAL MEMBERSHIPS

2016 – Present Society for Industrial and Applied Mathematics (SIAM)

2014 – Present	The Institute for Operations Research and the Management Sciences (INFORMS)
2014 – Present	Beta Gamma Sigma (The International Business Honor Society)

### **MENTORSHIP**

Engineering, Cornell University (IBM Research Intern)
Engineering, Cornett Oniversity (IDM Research Intern)
05/2021 – Present <b>Huozhi Zhou</b> , Ph.D. student, <i>Department of Electrical and Computer Engineering</i> ,
University of Illinois Urbana-Champaign (IBM Research Intern)
09/2020 – Present Vindula Jayawardana, Ph.D. student, Department of Electrical Engineering and
Computer Science, Massachusetts Institute of Technology (student of Prof. Cathy Wu)
06/2020 – 09/2020 <b>Michael Huang</b> , Ph.D. student, <i>Department of Data Science and Operations</i> ,
Marshall School of Business, University of Southern California (IBM Research
Intern)
10/2019 – Present <b>Trang H. Tran</b> , Ph.D. student, School of Operations Research and Information
Engineering, Cornell University (student of Prof. Katya Scheinberg)
05/2019 – 12/2019 <b>Hongsheng Liu</b> , Ph.D. student, <i>Department of Statistics and Operations Research</i> ,
University of North Carolina at Chapel Hill (IBM Research Intern).
Now at Huawei Technologies Co., Ltd., China
01/2019 – 08/2019 <b>Haoran Zhu</b> , Ph.D. student, Department of Industrial and Systems Engineering,
University of Wisconsin – Madison (IBM Research Intern)
01/2019 – 06/2020 <b>Toan N. Nguyen</b> , Ph.D. student, Department of Computer Science and Engineering,
University of Connecticut (student of Prof. Marten van Dijk)
01/2019 – 01/2021 <b>Nhuong V. Nguyen</b> , Ph.D. student, <i>Department of Computer Science and</i>
Engineering, University of Connecticut (student of Prof. Marten van Dijk)
08/2018 – Present Nhan H. Pham, Ph.D. student, Department of Statistics and Operations Research,
University of North Carolina at Chapel Hill (student of Prof. Quoc Tran-Dinh) (IBM
Research Intern)

## PH.D. COMMITTEE MEMBERSHIP

# OTHER WORK EXPERIENCE

09/2014 - 05/2015	<b>Teaching Assistant</b> , Lehigh University, Bethlehem, PA
	Courses: Engineering Probability (ISE 111), Applied Engineering Statistics (ISE 121)
05/2013 - 08/2013	Graduate Assistant (Web Developer), College of Business, McNeese State
	University, Lake Charles, LA
01/2012 - 12/2013	Graduate (Teaching) Assistant, McNeese State University, Lake Charles, LA
	Courses: Human Resource Management (MGMT 310), Staffing (MGMT 315),

Strategic Management (MGMT 481), Management Theory and Organizational
Behavior (MGMT 604), Issues in Global Business (BADM 218), Entrepreneurial
Finance for Small Business (FIN 308)
Software Engineer, FPT Software Company, Ho Chi Minh City, Vietnam
Teaching Assistant, Lomonosov Moscow State University, Moscow, Russia
Courses: Mathematical Analysis (Calculus), Linear Algebra and Analytic Geometry

#### **GRANT EXPERIENCE**

09/2020 - 09/2021

**IBM Co-PI,** "Hierarchical Disentangled Representations for Scalable Multi-agent Reinforcement Learning", MIT-IBM Watson AI Lab Exploratory Projects, \$100K, (MIT PI: Cathy Wu, IBM PI: Tsui-Wei (Lily) Weng)

#### **HONORS & AWARDS**

2019	IBM Outstanding Technical Achievement Award
2019	NeurIPS 2019 Top Reviewers
2019	Elizabeth V. Stout Dissertation Award, Lehigh University, Bethlehem, PA
2018	Van Hoesen Family Best Publication Award, Lehigh University, Bethlehem, PA
2016 - 2017	Dean's Doctoral Fellowship (RCEAS), Lehigh University, Bethlehem, PA
2014 - 2015	Dean's Doctoral Assistantship, Lehigh University, Bethlehem, PA
2014	Beta Gamma Sigma (Academic Honor Society)
2011 - 2013	Dore Graduate Stipends, McNeese State University, Lake Charles, LA