Lam M. Nguyen

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(Updated on 09/17/2019)

FIELDS OF INTEREST

Design and Analysis of Learning Algorithms, Large Scale Optimization, Machine Learning, Deep Learning, Reinforcement Learning, AI Solutions, Trusted AI

EDUCATION

2014 – 2018	**Ph.D.**, Department of Industrial and Systems Engineering, *Lehigh University*, Bethlehem, PA Thesis advisor: Prof. Katya Scheinberg 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.S.**, Applied Mathematics and Computer Science, Faculty of Computational Mathematics and Cybernetics, *Lomonosov Moscow State University*, Moscow, Russia Thesis advisor: Prof. Vladimir I. Dmitriev Thesis title: Methods for Detecting Hidden Period in Some Economics Processes

RESEARCH EXPERIENCE

10/2018 – Present	**Research Scientist**, *IBM T.J. Watson Research Center*, Yorktown Heights, NY Research areas: AI Solutions, Optimization, Machine Learning, Deep Learning, Reinforcement Learning o Doing optimization and AI research to build solutions for heavy industries o Developing algorithms and solutions for operations management across industries o Exploring and developing algorithms to address new problems in the area of convex and non-convex formulations for machine learning Technical: Python, TensorFlow, Keras
05/2018 – 08/2018	**Research Intern**, *IBM T.J. Watson Research Center*, Yorktown Heights, NY Research areas: Optimization, Machine Learning, Deep Learning, Reinforcement Learning o Provided a solution pattern that analyzes IoT sensor data and failure information from multiple assets and provides an interpretable insight for data-driven failure analysis Technical: Python
08/2017 – 05/2018	**Research Co-op**, *IBM T.J. Watson Research Center*, Yorktown Heights, NY Research areas: Optimization, Machine Learning, Deep Learning o Implemented a library for sparsification of deep neural networks o Explored and developed algorithms to address new problems in the area of convex

and non-convex formulations for machine learning
Technical: Python, TensorFlow, Keras

06/2017 – 08/2017 **Research Intern**, *IBM T.J. Watson Research Center*, Yorktown Heights, NY
Research areas: Optimization, Machine Learning, Deep Learning
- Developing sparsification methods for deep neural networks using optimization models

Technical: Python, TensorFlow

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
- Developed and improved machine learning algorithms in order to solve complex problems such as some structured prediction problems and neural network learning
- Proposed a new algorithm named SARAH, which can solve convex and non-convex large scale optimization finite-sum problems
- Developed stochastic models of service systems with on-demand agent invitations and designed real-time adaptive agent invitation schemes to minimize both waiting-times of customers and agents

Technical: MATLAB, Python, PyTorch, TensorFlow, C++

01/2012 – 12/2013 **Graduate (Research) Assistant,** *McNeese State University*, Lake Charles, LA
Research areas: Operations Management and Finance
- Published a paper related on investigating the effect of the financial crisis on CEO compensation using regression analysis to analyze the real data
- Developed a simulation model based on the given data from Calcasieu Parish School Board and provided suggestions to improve the performance of the system, which reduced 40% cost for employees

Technical: SAS, MATLAB, Arena Simulation

TEACHING EXPERIENCE

09/2014 – 05/2015 **Teaching Assistant**, *Lehigh University*, Bethlehem, PA
Courses: Engineering Probability (ISE 111), Applied Engineering Statistics (ISE 121)

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)

09/2007 – 05/2008 **Teaching Assistant,** *Lomonosov Moscow State University*, Moscow, Russia
Courses: Mathematical Analysis (Calculus), Linear Algebra and Analytic Geometry

OTHER WORK EXPERIENCE

05/2013 – 08/2013 **Graduate Assistant (Web Developer),** *McNeese State University*, Lake Charles, LA
- Developed and maintained a website for College of Business

Technical: PHP, JavaScript

09/2008 – 08/2009 **Software Engineer**, *FPT Software Company*, Ho Chi Minh City, Vietnam
- Analyzed functional requirements, developed and tested software applications

Technical: Java, C++, SQL, .NET (C#), JavaScript

PUBLICATIONS

[10] Phuong Ha Nguyen, **Lam M. Nguyen**, and Marten van Dijk. Tight Dimension Independent Lower Bound on the Expected Convergence Rate for Diminishing Step Sizes in SGD, *The 33th Annual Conference on Neural Information Processing Systems (**NeurIPS 2019**)*, 2019 *(21.17% acceptance rate)*

[9] **Lam M. Nguyen***, Phuong Ha Nguyen*, Peter Richtarik, Katya Scheinberg, Martin Takac, and Marten van Dijk. New Convergence Aspects of Stochastic Gradient Algorithms, *Accepted to Journal of Machine Learning Research (**JMLR**) after minor revision*

[8] Marten van Dijk, **Lam M. Nguyen**, Phuong Ha Nguyen, and Dzung T. Phan. Characterization of Convex Objective Functions and Optimal Expected Convergence Rates for SGD. *The 36th International Conference on Machine Learning (**ICML 2019**)*, PMLR 97, 2019 *(22.5% acceptance rate)*

[7] Tsui-Wei Weng, Pin-Yu Chen*, **Lam M. Nguyen***, Mark S. Squillante*, Akhilan Boopathy, Ivan Oseledets, and Luca Daniel. PROVEN: Verifying Robustness of Neural Networks with a Probabilistic Approach. *The 36th International Conference on Machine Learning (**ICML 2019**)*, PMLR 97, 2019 *(22.5% acceptance rate)*

[6] Dhaval Patel, **Lam M. Nguyen**, Akshay Rangamani, Shrey Shrivastava, and Jayant Kalagnanam. ChieF: A Change Pattern based Interpretable Failure Analyzer. *2018 IEEE International Conference on Big Data (**IEEE BigData 2018**)*, 2018

[5] **Lam M. Nguyen**, Phuong Ha Nguyen, Marten van Dijk, Peter Richtarik, Katya Scheinberg, and Martin Takac. SGD and Hogwild! Convergence Without the Bounded Gradients Assumption. *The 35th International Conference on Machine Learning (**ICML 2018**)*, PMLR 80, 2018 (*25% acceptance rate*)

IBM Research AI – Selected Publications 2018

[4] **Lam M. Nguyen**, Jie Liu, Katya Scheinberg, and Martin Takac. SARAH: A Novel Method for Machine Learning Problems Using Stochastic Recursive Gradient. *The 34th International Conference on Machine Learning (**ICML 2017**)*, PMLR 70:2613-2621, 2017 (*25% acceptance rate*)

Van Hoesen Family Best Publication Award

[3] **Lam M. Nguyen**, and Alexander L. Stolyar. A Queueing System with On-demand Servers: Local Stability of Fluid Limits. *Queueing Systems (**QUES**)*, 1-26, Springer, 2017

[2] **Lam M. Nguyen**, and Alexander L. Stolyar. A Service System with Randomly Behaving On-demand Agents. *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] Prasad Vemala, **Lam Nguyen**, Dung Nguyen, and Alekhya Kommasani. CEO Compensation: Does Financial Crisis Matter? *International Business Research*, 7(4):125-131, 2014

PREPRINTS

[7] Quoc Tran-Dinh, Nhan H. Pham, Dzung T. Phan, and **Lam M. Nguyen**. A Hybrid Stochastic Optimization Framework for Stochastic Composite Nonconvex Optimization, *arXiv preprint, 2019*

[6] Quoc Tran-Dinh, Nhan H. Pham, Dzung T. Phan, and **Lam M. Nguyen**. Hybrid

Stochastic Gradient Descent Algorithms for Stochastic Nonconvex Optimization, *arXiv preprint, 2019*

[5] Nhan H. Pham, **Lam M. Nguyen**, Dzung T. Phan, and Quoc Tran-Dinh. ProxSARAH: An Efficient Algorithmic Framework for Stochastic Composite Nonconvex Optimization, *arXiv preprint, 2019*

[4] **Lam M. Nguyen**, Marten van Dijk, Dzung T. Phan, Phuong Ha Nguyen, Tsui-Wei Weng, and Jayant R. Kalagnanam. Finite-Sum Smooth Optimization with SARAH, *arXiv preprint, 2019*

[3] **Lam M. Nguyen**, Katya Scheinberg, and Martin Takac. Inexact SARAH Algorithm for Stochastic Optimization, *arXiv preprint, 2018*

[2] **Lam M. Nguyen**, Nam H. Nguyen, Dzung T. Phan, Jayant R. Kalagnanam, and Katya Scheinberg. When Does Stochastic Gradient Algorithm Work Well? *arXiv preprint, 2018*

[1] **Lam M. Nguyen**, Jie Liu, Katya Scheinberg, and Martin Takac. Stochastic Recursive Gradient Algorithm for Nonconvex Optimization, *arXiv preprint, 2017*

PATENTS

2019 Dzung T. Phan, **Lam M. Nguyen**, Pavankumar Murali, and Jayant R. Kalagnanam. Prediction Optimization for System-level Production Control. (Pending) *Filed on July 23, 2019*

2019 Dzung T. Phan, **Lam M. Nguyen**, Nam H. Nguyen, and Jayant R. Kalagnanam. Compression of Deep Neural Networks. (Pending) *Filed on March 13, 2019*

THESES

2018 **Lam M. Nguyen**. A Service System with On-Demand Agents, Stochastic Gradient Algorithms and the SARAH Algorithm. *PhD dissertation, Lehigh University,* Bethlehem, PA

Elizabeth V. Stout Dissertation Award

2008 **Lam M. Nguyen**. Methods for Detecting Hidden Period in Some Economics Processes. *Undergraduate thesis, Lomonosov Moscow State University*, Moscow, Russia

INVITED TALKS

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 T.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

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)

PROFESSIONAL ACTIVITIES

2019	**Program Committee (Reviewer)**, 2020 IEEE/CVF Conference on Computer Vision and Pattern Recognition (*CVPR 2020*)
2019	**Program Committee (Reviewer)**, The 23rd International Conference on Artificial Intelligence and Statistics (*AISTATS 2020*)
2019	**Program Committee (Reviewer)**, The 34th AAAI Conference on Artificial Intelligence (*AAAI 2020*)
2019	**Program Committee (Reviewer)**, The 8th International Conference on Learning Representations (*ICLR 2020*)
2019	**Program Committee (Reviewer)**, The 35th Conference on Uncertainty in Artificial Intelligence (*UAI 2019*)
2019	**Program Committee (Reviewer)**, The 33th Annual Conference on Neural Information Processing Systems (*NeurIPS 2019*)
2019	**Program Committee (Reviewer)**, The 2019 IEEE/CVF International Conference on Computer Vision (*ICCV 2019*)
2019	**Reviewer**, Journal of Machine Learning Research, 2019
2019	**Session Chair**, "Fast and Provable Nonconvex Optimization Algorithms in Machine Learning" session, INFORMS Annual Meeting 2019
2019	**Program Committee (Reviewer)**, The 36th International Conference on Machine Learning (*ICML 2019*)
2018	**Program Committee (Reviewer)**, 2019 IEEE/CVF Conference on Computer Vision and Pattern Recognition (*CVPR 2019*)
2018	**Program Committee (Reviewer)**, The 22nd International Conference on Artificial Intelligence and Statistics (*AISTATS 2019*)
2018	**Program Committee (Reviewer)**, The 7th International Conference on Learning Representations (*ICLR 2019*)
2018	**Program Committee (Reviewer)**, The 33rd AAAI Conference on Artificial Intelligence (*AAAI 2019*)
2018	**Reviewer**, Optimization Methods and Software, 2018
2018	**Reviewer**, Journal of Machine Learning Research, 2018
2018	**Session Chair**, "Recent Advances in Optimization Methods for Machine Learning" session, INFORMS Annual Meeting 2018
2018	**Organizer**, "Sparse Optimization" and "Stochastic Gradient Descent" sessions, DIMACS/TRIPODS/MOPTA 2018
2018	**Program Committee (Reviewer)**, The 32nd Annual Conference on Neural Information Processing Systems (*NIPS/NeurIPS 2018*)
2018	**Program Committee (Reviewer)**, "Modern Trends in Nonconvex Optimization for Machine Learning", *ICML 2018 Workshop*
2018	**Program Committee (Reviewer)**, The 35th International Conference on Machine Learning (*ICML 2018*)
2017	**Program Committee (Reviewer)**, The 6th International Conference on Learning

	Representations (*ICLR 2018*)
2017	**Program Committee (Reviewer)**, The 31st Annual Conference on Neural Information Processing Systems (*NIPS 2017*)
2017	**Program Committee (Reviewer)**, The 34th International Conference on Machine Learning (*ICML 2017*)

MENTORSHIP

2019 – Present	**Toan N. Nguyen**, Ph.D. student, *University of Connecticut*, (student of Prof. Marten van Dijk)
2019 – Present	**Nhuong V. Nguyen**, Ph.D. student, *University of Connecticut*, (student of Prof. Marten van Dijk)
2018 – Present	**Nhan H. Pham**, Ph.D. student, *University of North Carolina at Chapel Hill* (student of Prof. Quoc Tran-Dinh)

HONORS & AWARDS

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

SKILLS & QUALIFICATIONS

Technical	Python, TensorFlow, Keras, PyTorch, MATLAB
	C++, Java, SAS, AMPL, SQL, C#, JavaScript, PHP, Linux
Language	Vietnamese (Native), English (Proficient), Russian (Proficient), French (Basic)
Leadership	Chief Administrator, Olympia Vietnam Forum and Community (2005 – 2015)