

Masoud Badiei Khuzani

CONTACT INFORMATION 440 Lotus Lane Mountain View, CA, USA **E-mail:** mbadieik@stanford.edu
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CORE SKILLS ♦ Mathematical Modeling and Optimization (8 years), Algorithm Developer (8 years), Python (Numpy, pandas, matplotlib, tensorflow, pytorch, keras) (4 years), MATLAB (Simulink) (10 years).

ACADEMIC EXPERIENCE **Stanford University**, Stanford, CA, US.
Postdoctoral Scholar (Dept. of Management Science) **July 2018**
♦ Mentors: Prof. Xing Lie and Prof. Yinyu Ye

Harvard University, Cambridge, MA, US.
Doctor of Philosophy in Applied Mathematics (SEAS) **September 2014-June 2018**
♦ PhD dissertation committees: Prof. David Parkes, Prof. Boaz Barack, Prof. Yilling Chen.
♦ Thesis Title: Primal-Dual Methods for Stochastic Optimization on Riemannian Manifolds and Connected Graphs

University of Waterloo, Waterloo, ON, Canada.
Master of Science (Dept. of Electrical and Computer Eng.) **September 2011 –December 2013**
♦ Adviser: Prof. Patrick Mitran, GPA: 92/100
♦ Thesis Title: Adaptive Power Control for Energy Harvesting Communication Systems (Available online on UW library website)

HONOURS AND AWARDS ♦ Stanford SCIT PhD fellowship, 2019.
♦ Travel Grant, IEEE Global Conference on Signal and Information Processing, 2016.
♦ IBM PhD fellowship for the academic year 2016-2017.
♦ Harry E. Clifford Scholarship for the academic year 2014-2015, Harvard University.
♦ University of Waterloo Graduate Scholarship Award for Outstanding Academic Achievement, Spring 2012.
♦ Faculty of Engineering (FoE) Graduate Scholarship Award for Outstanding Academic Achievement, Spring 2012.
♦ International Masters Student Award, 2011-2012.
♦ **Finalist** of 16th Nationwide Scientific Olympiad in Electrical and Computer Engineering, Iran, Summer 2011.

Ruijiang Li, Yan Wu, Michael Gensheimer, **M. Badiei Khuzani**, and Lei Xing, "Radiomics and Radiogenomics: Technical Basis and Clinical Applications", Chapman and Hall/CRC, Taylor & Francis Publication Group, 2019.

PUBLISHED/ACCEPTED/UNDER REVIEW PAPERS (▶: JOURNAL, ▷: CONFERENCE) :

- ▶ **M. Badiei Khuzani**, Hongyi Ren, Tauhidul MD Islam, Lei Xing, "A Distributionally Robust Optimization Method for Adversarial Multiple Kernel Learning", submitted to the Springer journal of machine learning, 2021, (*arXiv*:1902.10365).
- ▶ **M. Badiei Khuzani**, Yinyu Ye, Sandy Napel, Lei Xing, "A Mean-Field Theory for Learning the Schönberg Measure of Radial Basis Functions", submitted to the International Conference on Machine Learning, 2021, (*arXiv*:2006.13330).
- ▶ Md Tauhidul Islam, Xiaomeng Li, **M. Badiei Khuzani**, Jen-Yeu Wang, Lequan Yu, Liyue Shen, Hongyi Ren, Wei Zhao, and Lei Xing, "Data-driven self consistency as a general method for high-fidelity gene expression recovery", submitted to nature biotechnology, 2021.
- ▶ Hyunseok Seo, **M. Badiei Khuzani**, Varun Vasudevan, Charles Huang, Hongyi Ren, Ruoxiu Xiao, Xiao Jia, "Machine Learning Techniques for Biomedical Image Segmentation: An Overview of Technical Aspects and Introduction to State-of-the-Art Applications", published in medical physics, Volume 47, Issue 5, pp. 148-167, 2020, (*arXiv*:1911.02521)
- ▶ Charles Huang, **M. Badiei Khuzani**, Hyunseok Seo, Ming Ma, Xiaokun Liang, Dante Capaldi, Michael Gensheimer, Lei Xing, "Atlas Based Segmentations via Semi-Supervised Diffeomorphic Registrations", under review in medical physics, (*arXiv*:1911.10417)
- ▶ **M. Badiei Khuzani**, Liyue Shen, Shahin Shahrampour, Lei Xing, "A Mean-Field Theory for Kernel Alignment with Random Features in Generative and Discriminative Models", submitted to the journal of machine learning research (JMLR) 2019, (*arXiv*: 1909.11820).
- ▶ **M. Badiei Khuzani**, Hongyi Ren, Varun Vasudevan, Lei Xing, "On the sample complexity of projection free primal-dual method for learning mixture policies in Markov decision processes", 2019 IEEE 58th Conference on Decision and Control (CDC), 1293-1300, (*arXiv*: 1903.06727).
- ▷ **M. Badiei Khuzani**, "Distributed Primal-Dual Proximal Method for Regularized Empirical Risk Minimization", 2018 17th IEEE International Conference on Machine Learning and Applications (ICMLA).
- ▷ **M. Badiei Khuzani**, Na Li, "Stochastic Primal-Dual on Riemannian Manifolds of Bounded Sectional Curvature", in the Proceeding of ICMLA, Cancun, Mexico, 2017.
- ▶ **M. Badiei Khuzani**, H. Ebrahimzadeh Saffar, P. Mitran, "On Adaptive Power Control for Energy Harvesting Communication over Markov Fading Channels", IEEE Transactions on Communications, DOI:10.1109/TCOMM.2016.2628059, 2016.
- ▷ Reza Azimi, **M. Badiei Khuzani**, Xin Zhan, Sherief Reda, Na Li, "Fast decentralized power capping for server clusters", in Proceeding of HPCA, Austin, Texas, USA, 2016.
- ▷ **M. Badiei Khuzani**, Na Li, "Distributed Regularized Primal-Dual Method", in Proceeding of GlobalSIP, Washington DC, 2016.
- ▷ **M. Badiei Khuzani**, Xin Zhan, Reza Azimi, Reda Sherif, Na Li, "DiBA: Distributed Power Budget Allocation for Data Centers", in Proceeding of CCGrid, Cartagena, Colombia, 2016.
- ▶ H. Ebrahimzadeh Saffar, **M. Badiei Khuzani**, P. Mitran, "Time Asynchronous Multi-user Gaussian networks with Correlated Sources ", IEEE Transactions on Information Theory, 2015, (*arXiv*:1408.1750), volume 62 , issue 1, pp. 309 - 321.

- ▶ Meysam Sharbaf Motlagh, **M. Badiei Khuzani**, P. Mitran, “On Lossy Joint Source-Channel Coding In Energy Harvesting Communication Systems”, *IEEE Transactions on Communications*, 2015, (*arXiv*:1508.04526), volume 63, issue 11, pp. 4433 - 4447.
- ▷ **M. Badiei Khuzani**, Na Li, Adam Wierman, “Online Convex Optimization with Ramp Constraints”, in *Proceeding of 54th Conference on Decision and Control (CDC)*, Osaka, Japan, 2015.
- ▷ Meysam Sharbaf Motlagh, **M. Badiei Khuzani**, P. Mitran, “On Lossy Source Transmission in Energy Harvesting Communication Systems”, in *Proceeding of International Symposium on Information Theory (ISIT)*, Hawaii, 2014.
- ▷ **M. Badiei Khuzani**, H. Ebrahimzadeh Saffar, E. Haj Mirza Alian, P. Mitran, “On Optimal Online Power Policies for Energy Harvesting with Finite-State Markov Channels”, in *Proceeding of International Symposium on Information Theory (ISIT)*, Istanbul, 2013.
- ▷ H. Ebrahimzadeh Saffar, **M. Badiei Khuzani**, P. Mitran, “Two-way Lossy Communication of Correlated Gaussian Sources with Amplify-and-Forward Relaying”, in *Proceeding of Canadian Workshop on Information Theory (CWIT)*, Toronto, 2013.
- ▶ **M. Badiei Khuzani**, P. Mitran, “On Online Energy Harvesting in Multiple-Access Communication Systems”, *IEEE Transactions on Information Theory*, volume 60, issue 3, pp.1883-1898, (*arXiv*:1301.1027).
- ▷ **M. Badiei Khuzani**, H. Ebrahimzadeh Saffar, J. Haber-Kucharsky, P. Mitran, “On Bi-directional Lossy Communication of Correlated Gaussian Sources”, in *Proceeding of International Conference on Communication (ICC)*, Budapest, 2012.
- ▷ H. Ebrahimzadeh Saffar, **M. Badiei Khuzani**, P. Mitran, “Lossy Source-Channel Communication over a Phase-Incoherent Interference Relay Channel”, in *Proceeding of International Symposium on Information Theory (ISIT)*, Boston, 2012.

WORKING PAPER:

- ▶ **M. Badiei Khuzani**, Mohsen Bayati, Yinyu Ye, Lei Xing, “On metastability and spectral gap of Columb and Reisz Plasma in p -spin spherical spin glass models”, 2021.
- ▶ **M. Badiei Khuzani**, Yizheng Chen, Varun Vasudevan, Charles Huang, Sandy Napel, and Lei Xing, “A Locally Sensitive Hashing Method for CT Image Retrieval in the Cancer Treatment Planning”, 2021.

SELECTED
GRADUATE
COURSEWORK

- ◇ *Pure and Applied Mathematics*: Algebraic Topology (Audit), Morse Theory, Differential geometry, Topology, Perturbation theory, Abstract Algebra (Group Theory), Analysis I and II.
- ◇ *Probability and statistics*: Stochastic processes, Queueing systems.
- ◇ *Optimization and Control*: Convex optimization (Audit), Fundamental of optimization (Linear Programming), Linear control theory.
- ◇ *Information Theory and Communication*: Inference and Information, Information theory, Advanced topics on communication and information theory, Advanced digital communication, Statistical signal processing, Digital Signal Processing (DSP).
- ◇ *Physics*: Statistical mechanics, Quantum Mechanics I, Statistical Physics for Information Processing.
- ◇ *Computer Science*: Information Theory in Computer Science, Topics on Computation.

PROFESSIONAL
MEMBERSHIP

- ◇ Institute for Electrical and Electronics Engineers (IEEE), Membership ID: 92302363, since 2011.

INVITED TALKS AND PRESENTATIONS
 ITA conference, San Diego, 2020.
 SCIT Seminar, Medical School, Stanford University, 2021.
 Sunnyvale Baidu reserach lab, 2019 (invited by Prof. Ping Li)
 Harvard University, Medical School, May 2018 (invited by Dr. Mariani, Prof. Redline, and Prof. Purcell)
 Princeton University, Department of Electrical Engineering, May 2018 (invited by Prof. Mung Chiang, and Prof. Yuxin Chen)
 Stanford University, Department of Radiation Oncology and Department of Management Science, May 2018 (invited by Prof. Lei Xing, and Prof. Yinyu Ye)
 Sunnyvale Baidu reserach lab, April 2018 (invited by Prof. Ping Li)
 Boston University, Department of Electrical and Computer Engineering (invited by Prof. Olshevsky and Prof. Saligrama), April 2018
 IBM J. Watson Research Center, Yorktown Height, New York, 2017 (host: Dr. Chai Wu)
 IEEE Conference on Signal Processing (GLobal SIP), Washington DC, 2016
 Institute for Mathematics and its Applications (IMA), Minnesota, 2016.
 North American School of Information Theory, Toronto, Canada, 2014.
 IEEE International Conference on Communications (ICC), Budapest, Hungary, 2013.
 IEEE International Symposium of Information Theory (ISIT), Istanbul, Turkey, 2013.
 Student Conference Presentations (Grad-talk), University of Waterloo, October 2013.
 IEEE International Symposium of Information Theory (ISIT), Cambridge, USA, 2012.

WORKSHOPS
 Training workshop for teacher assistants, Fall 2013 (Certificate will be presented upon request).

PROFESSIONAL SERVICE
 ♦ *Journal Reviews*: IEEE Transactions on Communications, IEEE Communication Letters, IEEE Wireless Communications Letters, IEEE Journal on Selected Area on Communications, IEEE Transactions on Control of Network Systems.
 ♦ *Conference Reviews*: Globecomm 2014, CDC 2017, CDC 2018, CDC 2020

TEACHING EXPERIENCE
 ♦ ES 158 Teaching Fellow, Harvard University, Fall 2015.
 ♦ ECE 318 lab instructor, University of Waterloo, Fall 2013.

SAMPLE PAST PROJECTS:
 ♦ Decryption of an encrypted text (scrambled text with permutation), using the Metropolis-Hasting algorithm on top of n -grams based model for the language (Available upon request).
 ♦ Simulation of the LMS adaptive filter for a linear prediction, Kalman and Wiener's filters for estimating signals from noisy measurements, and ARMA and GARCH models for time series forecasting and volatility analysis via Python Language, (Available upon request).

LANGUAGE
 English (fluent), Farsi (native).
 GRE scores: Verbal (160/170)- Quantitative (169/170)(Exam date: Nov/14/2013)

REFEREES
 ♦ *Prof. Patrick Mitran*: Professor, EE department, University of Waterloo
 ♦ *Prof. David Parkes*: Professor, School of Engineering and Applied Sciences, Harvard University
 ♦ *Prof. Lei Xing*: Professor. Department of Radiation Oncology, Stanford University
 ♦ *Prof. YinYu Ye*: Professor, Department of Management Science, Stanford University
 ♦ *Prof. Sandy Napel*: Professor. Department of Radiation Oncology, Stanford University.