

Mohammadreza Nazari
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PROFILE OVERVIEW	I am interested in the design and application of efficient <i>Machine Learning</i> algorithms in real-world problems. I am looking for a career to further develop my skills and improve our everyday life by applying various components of <i>Artificial Intelligence</i> , and specifically <i>Reinforcement Learning</i> .	
FIELDS OF INTEREST	Reinforcement Learning, Deep Neural Networks, Optimization Methods in Machine Learning, Supply Chain Management, Healthcare, and Finance	
EDUCATION	<p>Ph.D. (expected) Industrial Engineering (GPA: 3.80) August 2014 - May 2019 Lehigh University, Bethlehem, PA, USA <i>Advisors:</i> Lawrence Snyder, Martin Takáč <i>Research Focus:</i> Designing Optimal Decision-Making Frameworks for Real-World Problems using Stochastic Control and Deep Reinforcement Learning</p> <p>M.S. Socio-Economic Systems Engineering August 2010 - January 2013 Sharif University of Technology, Tehran, Iran <i>Thesis:</i> Portfolio Optimization of Banking Corporations versus Others, Using a Shortfall Risk Method Accompanied with Robust Optimization</p> <p>B.S. Industrial Engineering August 2006 - August 2010 Sharif University of Technology, Tehran, Iran <i>Thesis:</i> Designing and Implementation of the Performance Evaluation and Incentive Systems in a Heavy Machines Production Company</p>	
TECHNOLOGY SKILLS	<p><i>Programming Languages:</i> Python, C, C++ (BLAS, MPI, OpenMP, CUDA(GPU)), C#, MATLAB, HTML, ABAP <i>Deep Learning:</i> TensorFlow, PyTorch <i>Optimization Softwares:</i> CPLEX, GuRoBi, AMPL, GAMS, LINGO, LINDO <i>Statistical Software:</i> Stata, Eviews, SAS <i>Project Management:</i> Microsoft Project, Primavera <i>Simulation:</i> Arena, GPSS <i>Others:</i> Microsoft Office, git, Linux, Server Administration</p>	
AWARDS AND HONORS	<p>Rossin Doctoral Fellowship Award, Lehigh University ISE Ph.D. Student of Year, Lehigh University Graduate Student Leadership and Service Award, Lehigh University Gotshall Fellowship, Lehigh University Ranked 1st among more than 8,000 Industrial Engineering Participants in the Iranian National Graduate Qualification Exam Ranked 10th among more than 8,000 Management of Socio-Economic Systems Participants in the Iranian National Graduate Qualification Exam Ranked 663th among more than 400,000 Participants in Iranian Iranian National Undergraduate Qualification Exam</p>	<p>Spring 2017 Spring 2017 Spring 2017 Spring 2017 2010 2010 2006</p>

WORKING EXPERIENCE

Deep Reinforcement Learning Intern, SAS Institute Summer 2017 - Current

- Conducted feasibility study and designed general-purpose RL framework for real-life problems. Studied customer journey optimization as proof of concept with DQN and FQI algorithms
- Designed Deep Concurrent TD algorithm for online customer journey optimization
- Incorporated ATEN tensor library in SAS code for efficient implementation of general-purpose components and algorithms
- Implemented HTTP Rest API for connecting the OpenAI Gym testbeds to SAS code repository
- Implemented DQN algorithm in SAS C code
- Studied controlling HVAC systems with DDPG algorithm

Teaching Assistant, Lehigh University

- *Service Systems Engineering:* Fall 2016
Lectured about recent advances in AI and its applications in service systems.
- *Simulation:* Spring 2015
Collaborated with instructor in defining course projects.
- *Production and Inventory Control* Fall 2014
Collaborated with instructor and Factory Physics Inc. in defining final project of course, which was a case-study on designing inventory strategy for West Pipeline Corporate.

SAP HR Consultant, SEA (IT Banking) May 2012 - June 2014

- Extracted business processes and suggested possible improvements.
- Implemented time management module for a company with > 5000 personnel, and SEA itself with > 250 personnel.
- Integrated time clock systems with time management module so that data was transferred online to SAP system.
- Developed automatic time evaluation system for different shifts.
- Integrated time management with payroll module for automatic payroll calculations.
- Designed Web Portal for personnel so that they can create online leave requests, overtime requests, and observe personal time reports.
- Deployed workflows for confirmation of requests by higher managers.
- Leveraged time calculation process from several days to a few minutes.

SAP FI Consultant, SEA (IT Banking) April 2013 - June 2014

- Implemented SAP financial module in SEA.
- Integrated FI with the procurement system and sales.
- Prepared blueprint for implementation of SAP FICO in banking company.
- Designed roadmap on how to integrate SAP FICO with core banking system.

PUBLICATIONS

Reinforcement Learning for Vehicle Routing Problem, with Afshin Oroojlooy, Martin Takáč, and Lawrence Snyder, accepted to NIPS 2018

Reward Maximization in General Dynamic Matching Systems, with Alexander Stolyar, accepted for publication in *Queueing Systems* 2018

Online Reinforcement Learning with Applications in Customer Journey Optimization, with Afshin Oroojlooy, and Mustafa Kabul, NIPS Deep RL Symposium 2017

A Deep Q-Network for the Beer Game: An Approach to Solve Inventory Optimization Problems, with Afshin Oroojlooy, Martin Takáč and Lawrence Snyder, NIPS Deep RL Symposium 2017

WORK IN PROGRESS

Corrective Reinforcement Learning: An Optimal Student-Teacher Framework, with Majid Jahani, Martin Takáč, and Lawrence Snyder

Addressing Measurement Error in Health Economics using Semi-Supervised Learning, with Bitu Fayaz Farkhad and Martin Takáč

Multi-Agent Image Recognition with Partially Observable Image Views, with Hossein Mousavi, Nader Motee, and Martin Takáč

SCHOLARLY PRESENTATIONS

Reinforcement Learning for Solving the Vehicle Routing Problem

- COR@L Seminar, Lehigh University, Bethlehem, PA September 2018
- MOPTA Conference, Lehigh University, Bethlehem, PA August 2018
- IBM Zurich, presented by Martin Takáč July 2018
- INFORMS, Houston, TX October 2017

A Deep Q-Network for the Beer Game with Partial Information

- MOPTA Conference, presented by Afshin Oroojlooy, Lehigh University, Bethlehem, PA August 2018
- INFORMS, presented by Afshin Oroojlooy, Houston, TX October 2017

Reward Maximization in General Dynamic Matching Systems

- COR@L Seminar, Lehigh University, Bethlehem, PA September 2017
- INFORMS Applied Probability Conference, presented by Alexander Stolyar, Evanston, IL July 2017
- INFORMS, Nashville, TN November 2016
- MOPTA Conference, Lehigh University, Bethlehem, PA August 2016

OTHER PRESENTATIONS

Machine Learning for Economists ($\times 2$)

- Rauch Business School, Lehigh University, Bethlehem, PA November 2018

Introduction to Reinforcement Learning Algorithms

- RL Weekly Seminars ($\times 4$), Lehigh University, Bethlehem, PA September 2018
- SAS Institute, Cary, NC August 2018

MATLAB Tutorial

- Invited, Lehigh University, Bethlehem, PA September 2018

Tutorial on Policy Gradient Optimization Method in Reinforcement Learning

- SAS Institute, Cary, NC July 2018
- OptML Series ($\times 2$), Lehigh University, Bethlehem, PA December 2017

COMMUNITY SERVICE

Referee for NIPS, ICML, ICLR and AISTATS

Initiator/Organizer of Weekly Deep RL Seminars Fall 2018

Vice President of INFORMS Student Chapter April 2016 - April 2017

INFORMS Conference Student Organizer 2015 & 2016

SELECTED COURSES

- Computational Methods in Optimization
- Optimization Methods in Machine Learning
- Nonlinear Optimization
- Convex Analysis
- Real Analysis
- Advanced Probability
- Design and Analysis of Algorithms
- Dynamic Programming

SELECTED COURSE PROJECTS

Computational Methods in Optimization using C++: Fall 2016

- *Distributed Parallel LBFGS Algorithm:* Implemented in C++ using MPI parallel setting (winning algorithm of the class competition)
- Cache-friendly implementation of decomposition methods for solving system of linear equations
- Cache-friendly implementation of different sorting algorithms.

Optimization Methods in Machine Learning: Spring 2016

- *Random Matrices:* Quantifying the approximation error of quadratic interpolation models
- *Various Algorithms in MATLAB:* SVM with interior point methods, gradient descent for regularized logistic regression, gradient descent for sparse logistic regression, stochastic gradient descent method

Nonlinear Optimization: Fall 2015

- Implementing line search and trust region methods for solving unconstrained optimization problems (MATLAB)

Dynamic Programming: Spring 2015

- Optimal production planning with emission trading (MATLAB)
- Valuation of a peaker combustion turbine (MATLAB)

LANGUAGE PROFICIENCY

Fluent: English, Azeri, Farsi
intermediate proficiency: Turkish

REFERENCES

Lawrence Snyder

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