





Parshan Pakiman

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OVERVIEW

I am a Ph.D. candidate in Information and Decision Sciences at the University of Illinois at Chicago. I work towards developing off-the-shelf Reinforcement Learning (RL) algorithms to tackle real-world business problems. Adapting conventional RL methods to a given decision-making problem often requires challenging hyperparameter tuning and heuristic approximations. To sidestep these practical bottlenecks and broaden the use of RL methods, I develop algorithms that self-adapt to different stochastic input models and other instance characteristics without requiring significant hand engineering and domain-knowledge. My research advances RL by leveraging optimization, machine learning, and high-dimensional sampling and statistics. I employ state-of-the-art platforms such as Gurobi, Pyomo, CVXPY, and OpenAI-Gym to test RL methods on marketing, e-commerce, inventory control, and sustainable warehousing applications.

EDUCATION

University of Illinois at Chicago (UIC), Chicago, IL

Ph.D. in: Information and Decision Sciences
Thesis title: Self-adapting Reinforcement Learning
Co-advisors: Professors Selva Nadarajah and Negar Soheili

Spring 2017 -
(Expected) Fall 2021

University of Illinois at Chicago, Chicago, IL

M.Sc. in: Business Analytics

Spring 2017 -
(Expected) Fall 2021

University of Tehran, Tehran, Iran

B.Sc. in: Applied Mathematics

Fall 2012 - Fall 2016

WORK EXPERIENCES

- Collaborated with a major e-commerce company to design an AI system that minimizes packaging waste by jointly learning packaging workers' preferences and optimizing cardboard boxes' dimensions. Spring 2021
- Worked with Foresight ROI to design a framework for mining past marketing data and for optimizing future marketing campaigns ([Link](#) to the resulting paper). Fall 2017 - Summer 2019
- Teaching and implementation experience in graduate classes with data mining, statistical learning, machine learning, and operations management. Since Fall 2014
- Collaborator on a multi-university and industry initiative to develop an open-source reinforcement learning and approximate dynamic programming platform to solve business applications. Fall 2019

RESEARCH INTERESTS

- Working towards off-the-shelf RL algorithms that sidestep hyperparameter tunings and heuristic hand-engineerings, making RL accessible to users without domain-knowledge.
- Learning stochastic models from data trajectories that manage risks associated with model misspecification and poorly tuned hyperparameters.
- Tackling real-world problems in dynamic pricing, marketing, e-commerce, and sustainable warehousing by implementing methods based on novel machine learning and optimization platforms, i.e., TensorFlow and Gurobi.

AWARDS AND HONORS

BGS¹ membership: College of Business, University of Illinois at Chicago Since Spring 2021
Doctoral fellowship: Department of Information and Decision Sciences, University of Illinois at Chicago Since Spring 2017
Top student award: Department of Mathematics, Statistics and Computer Science, University of Tehran Fall 2016
Technical qualification: RoboCup Iran open, soccer 2D simulation league Fall 2016
Technical qualification: Khwarizmi international award, soccer 2D simulation league Fall 2010

TECHNICAL SKILLS

Programming language: Python, C++, C, R, Java, HTML, JavaScript
Python package: NumPy, SciPy, Pandas, Matplotlib, TensorFlow, Scikit-learn
Optimization solver: GUROBI, AMPL, Pyomo, Nevergrad, CVXPY
Operating systems: Linux, MacOS, Windows

¹Beta Gamma Sigma (BGS) is an International Business Honor Society ([Link](#)).

PUBLICATIONS

Journal Papers

- B. Chen, S. Nadarajah, P. Pakiman, S. Jasin. *Self-adapting Robustness in Demand Learning* ([Link](#)). Under first round review at **Operations Research**.
- P. Pakiman, S. Nadarajah, N. Soheili, Q. Lin. *Self-guided Approximate Linear Programs* ([Link](#)). Under second round review at **Management Science**.

Conference Papers

- P. Pakiman, S. Nadarajah, Y. F. Lim. *Guiding Agents via Menus when Optimization and/or Learning Costs are High*. Under review at **Thirty-eighth International Conference on Machine Learning**, 2021.
- A. Chenreddy, P. Pakiman, S. Nadarajah, R. Chandrasekaran, R. Abens. *SMOILE: A Shopper Marketing Optimization and Inverse Learning Engine* ([Link](#)). **Proceedings of the 25th ACM SIGKDD International Conference on Knowledge Discovery & Data Mining**, 2019. Acceptance rate 6.4%.

Workshop Papers

- P. Pakiman, S. Nadarajah, N. Soheili, Q. Lin. *Self-guided Approximate Linear Programs* ([Link](#)). **NeurIPS workshop on Self-Supervised Learning – Theory and Practice**, 2020.

Work in Progress

- P. Pakiman, S. Nadarajah, Y. F. Lim. *Putting Social Responsibility on the Menu: AI-Guided Tool Selection that Aligns Worker and Social Objectives*. In preparation to submit to **Manufacturing & Service Operations Management**.
- D. R. Jiang, S. Nadarajah, P. Pakiman, Y. Wang. *Comparing Approximate Dynamic Programming Algorithms on Operations Management Applications*. Working paper.

INVITED TALKS

Putting Social Responsibility on the Menu: AI-Guided Tool Selection that Aligns Worker and Social Objectives

- POMS 31st Annual Conference, Virtual Spring 2021

Self-adapting Robustness in Demand Learning

- INFORMS Annual Meeting, Virtual Fall 2020
- INFORMS Revenue Management and Pricing Student Live Paper Series, [Link](#), Virtual Fall 2020

Self-guided Approximate Linear Programs

- POMS 30th Annual Conference, Washington D.C. Spring 2019
- INFORMS Annual Meeting, Phoenix, AZ Fall 2018
- POMS 29th Annual Conference, Houston, TX Spring 2018

SMOILE: A Shopper Marketing Optimization and Inverse Learning Engine

- ACM SIGKDD, International Conference on Knowledge Discovery & Data Mining, [Link](#), Anchorage, AK Summer 2019

POSTER PRESENTATIONS

Self-guided Approximate Linear Programs

- NeurIPS 2020, Workshop on Self-Supervised Learning – Theory and Practice, [Link](#), Virtual Fall 2020

SMOILE: A Shopper Marketing Optimization and Inverse Learning Engine

- ACM SIGKDD, International Conference on Knowledge Discovery & Data Mining, [Link](#), Anchorage, AK Summer 2019

TEACHING EXPERIENCES

Lecturer, University of Illinois at Chicago

Since Spring 2019

- Business data mining (IDS 472), *introduction to R*.
- Statistical models and methods for business analytics (IDS 575), *refresher on linear algebra, calculus, and probability theory*.
- Statistical models and methods for business analytics (IDS 575), *applications of regression, classification and likelihood maximization*, [Link](#).

Teaching Assistant, University of Illinois at Chicago

Since Spring 2017

- Advanced text analytics for Business (IDS 566)
- Business data mining (IDS 472)
- Business forecasting (IDS 476)
- Data science for online customer analytics (IDS 594)
- Introduction to operations management (IDS 532)
- Statistical models and methods for business analytics (IDS 575)

Teaching Assistant, University of Tehran

Spring 2014 - 2016

- Introduction to numerical analysis and scientific computing
- Numerical linear algebra

SERVICE

Reviewer

- Annals of Operations Research
- Computers & Operations Research
- Electronic Commerce Research
- Information Systems and Operational Research

Since Fall 2020

Since Spring 2019

Since Spring 2018

Since Fall 2018

Conference Organization

- Session chair, *Recent Advances in Reinforcement Learning*, INFORMS Annual Meeting
- Session co-chair, *Social Responsibility and Risk in Supply Chains*, INFORMS Annual Meeting

Fall 2021

Fall 2021

Membership

- IDS committee for organizing curriculum of *programming in R*
- Beta Gamma Sigma (BGS) society
- Institute for Operations Research and the Management Sciences (INFORMS)
- Production and Operations Management Society (POMS)

Spring 2021

Since Spring 2021

Since Fall 2018

Since Fall 2018