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. My research advances solution techniques for solving high-dimensional decision-making problems. I develop self-adapting Reinforcement Learning (RL) algorithms for settings where a decision maker faces a dataset generated from an unknown decision making process. Such an RL method self-adapts to data by learning a model of the data generation process and uses this model to optimize a control policy. My research contributes to RL, high-dimensional sampling, inverse RL, machine learning, and online learning literatures. I employ state-of-the-art platforms such as Gurobi, Pyomo, CVXPY, Nevergrad, and TensorFlow to test RL algorithms on real-world applications.

EDUCATION

University of Illinois at Chicago (UIC), Chicago, IL — *Spring 2017 - (Expected) Fall 2021*

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

University of Illinois at Chicago, Chicago, IL — *Spring 2017 - (Expected) Fall 2021*

M.Sc. in:	Business Analytics

University of Tehran, Tehran, Iran — *Fall 2012 - Fall 2016*

B.Sc. in:	Applied Mathematics

WORK EXPERIENCES

— Collaborated with a major e-commerce company to design an AI system (AIS) that (i) learns a model of workers' probability to select cardboard boxes for packing orders and (ii) uses this model to optimize box dimensions; that is, AIS aligns the company's social goals and workers' objectives. *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 problems. *Fall 2019*

— Reviewing research articles for multiple journals in the areas of Operations Research and E-commerce. *Since Fall 2019*

RESEARCH INTERESTS

— Working towards off-the-shelf RL algorithms requiring less hyperparameter tuning and can be used by practitioners without domain-specific knowledge.

— Optimizing policy for a decision maker (DM) who faces a dataset that itself is generated from a decision making process (e.g., a math program) unknown to DM.

— Developing RL algorithms that "self-adapt" to the data generation process aiming to deliver robust decisions and streamline the implementation.

— Tackling real-world applications arising in dynamic pricing, marketing, and e-commerce by implementing methods based on novel machine learning and optimization platforms such as Gurobi, TensorFlow, and OpenAI Gym.

AWARDS AND HONORS

BGS[1] 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, PyTorch, Gurobi, Pyomo, Nevergrad, CVXPY
Operating systems:	Linux, MacOS, Windows

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[1]Beta Gamma Sigma is The 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
Since Spring 2019

- Business data mining (IDS 472). Topic: *introduction to R.*
- Statistical models and methods for business analytics (IDS 575). Topic: *refresher on linear algebra, calculus, and probability theory.*
- Statistical models and methods for business analytics (IDS 575). Topic: *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 Since Fall 2020
- — Computers & Operations Research Since Spring 2019
- — Electronic Commerce Research Since Spring 2018
- — Information Systems and Operational Research Since Fall 2018

Conference Organization

- — Charing a session, *Recent Advances in Reinforcement Learning*, INFORMS Annual Meeting Fall 2021
- — Co-charing a session, *Social Responsibility and Risk in Supply Chains*, INFORMS Annual Meeting Fall 2021

Membership

- — IDS committee for organizing curriculum of *programming in R* Spring 2021
- — Beta Gamma Sigma (BGS) society Since Spring 2021
- — Institute for Operations Research and the Management Sciences (INFORMS) Since Fall 2018
- — Production and Operations Management Society (POMS) Since Fall 2018