Parshan Pakiman

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Academic Employment

Booth School of Business, The University of Chicago, USA 2023 - Present

Position Postdoctoral Principal Researcher

Mentor Dan Adelman

Education

College of Business Administration, University of Illinois Chicago, USA 2017 - 2023

Ph.D. Information and Decision Sciences

Thesis title Self-guided Approximate Linear Programs: Randomized Multi-shot Approximation of Markov Decision Processes

Advisor Selva Nadarajah

College of Business Administration, University of Illinois Chicago, USA 2017 - 2023

M.Sc. Business Analytics

College of Science, University of Tehran, Iran 2012 - 2016

B.Sc. Applied Mathematics

Research Interests

- Developing decision support for operating room management by accounting for the temporal impact of decisions on costs, multiple sources of uncertainty, and competing objectives.
- Developing general-purpose reinforcement learning algorithms that deliver computationally tractable control policies with near-optimal performance guarantees across application domains.
- Modeling the data generation process underlying real-world business problems using reinforcement learning and machine learning techniques to design risk-sensitive operating policies.

Research Papers

Accepted Journal Paper

- P. Pakiman, S. Nadarajah, N. Soheili, Q. Lin. *Self-Guided Approximate Linear Programs: Randomized Multi-Shot Approximation of Discounted Cost Markov Decision Processes.* Accepted in **Management Science** (**Link**).

In-preparation Journal Papers

- D. Adelman, A. J. Mersereau, P. Pakiman. *Dynamic Matching with Learning.* In preparation for submission to **Operations Research**.
- P. Pakiman, S. Nadarajah. *Randomized Multi-Shot Approximation of Average Cost Markov Decision Processes.* In preparation for submission to **Operations Research**.
- P. Pakiman, B. Chen, S. Nadarajah, S. Jasin. *Self-adapting Risk Management in Dynamic Pricing with Demand Learning.* In preparation for submission to **Manufacturing & Service Operations Management** (**Link**).

Working Journal Papers

- D. Adelman, C. Keceli, P. Pakiman. *Equitable and Data-driven Dynamic Matching.*
- D. Adelman, P. Pakiman. *Retrospective Approximate Dynamic Programming.*
- P. Pakiman, S. Nadarajah. *Randomized Multi-Shot Least Squares Monte Carlo for Option Exercise.*

Accepted Conference Paper

- A. Chenreddy, P. Pakiman, S. Nadarajah, R. Chandrasekaran, R. Abens. *SMOILE: A Shopper Marketing Optimization and Inverse Learning Engine.* **Proceedings of the 25th ACM SIGKDD International Conference on Knowledge Discovery & Data Mining**, 2019 (**Link**). Acceptance rate 6.4%.

Industry Research Collaborations

- Interned with the Advanced Solutions team at *Guidehouse:* Developed a reinforcement learning algorithm to address a workflow scheduling problem. 2021
- Collaborated with *Foresight ROI*: Developed an inverse reinforcement learning framework to mine past marketing data and optimize future marketing campaigns across retailers (**Link** to the resulting research paper). 2017 - 2019

Honors and Awards

Doctoral fellowship:	College of Business Administration, University of Illinois Chicago, USA	2017 - 2023
BGS[1] membership:	College of Business Administration, University of Illinois Chicago, USA	2021
Direct master's recipient:	College of Science, University of Tehran, Iran	2016
Technical qualification:	Soccer Simulation League, RoboCup Iran open (**Link**), Iran	2016
Technical qualification:	Soccer Simulation League, Khwarizmi International Award, Iran	2010

Computational Skills

Programming languages:	Python, R, C++, C, Java, Matlab, HTML, JavaScript
Data science libraries:	Scikit-learn, Gymnasium, Numba, NumPy, Matplotlib, SciPy, Pandas
Optimization libraries:	Gurobi, CVXPY, Nevergrad, Autograd, PyTorch, Pyomo, OR-Tools
Operating systems:	Linux, MacOS, Windows

Teaching Experiences

Note: All teaching materials are available at **parshanpakiman.github.io/teaching**.

Course Co-Designer, University of Illinois Chicago 2021 - 2023

- Optimization for Analytics (IDS 435). Engaged in developing a new data science course, IDS 435, by designing curriculum, developing assignments, providing Python templates, and designing final project.

Guest Instructor, University of Illinois Chicago 2019 - 2023

- Supply Chain Management (IDS 552). Taught two sessions on warehouse management.
- Business Data Mining (IDS 472). Taught multiple refresher sessions on introduction to programming in R.
- Statistical Models and Methods for Business Analytics (IDS 575). Taught refresher classes on linear algebra, calculus, and probability.
- Statistical Models and Methods for Business Analytics (IDS 575).Taught sessions on regression, classification and likelihood maximization.

Teaching Assistant, University of Illinois Chicago 2019 - 2023

- Data Science for Online Customer Analytics (IDS 594)
- Statistical Models and Methods for Business Analytics (IDS 575)
- Advanced Text Analytics for Business (IDS 566)
- Introduction to Operations Management (IDS 532)
- Business Forecasting (IDS 476)
- Business Data Mining (IDS 472)
- Optimization for Analytics (IDS 435)

Teaching Assistant, University of Tehran 2014 - 2016

- Introduction to Numerical Analysis and Scientific Computing
- Numerical Linear Algebra

Invited Talks

Self-Adapting Risk Management in Demand Learning

- INFORMS Annual Meeting, Phoenix, AZ 2023
- INFORMS Annual Meeting, Virtual 2020
- INFORMS Revenue Management and Pricing Student Live Paper Series, **Link**, Virtual 2020

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

Randomized Multi-Shot Least Squares Monte Carlo for Option Exercise
- INFORMS Annual Meeting, Phoenix, AZ 2023
- POMS 32nd Annual Conference, Virtual 2022

Self-Guided Approximate Linear Programs: Randomized Multi-Shot Approximation of Discounted Cost Markov Decision Processes
- Tuck School of Business, Dartmouth College, Hanover, NH 2022
- International Conference on Continuous Optimization (ICCOPT), Bethlehem, PA 2022
- INFORMS Optimization Society (IOS) Conference, Greenville, SC 2022
- INFORMS Annual Meeting, Anaheim, CA 2021
- POMS 30th Annual Conference, Washington D.C. 2019
- INFORMS Annual Meeting, Phoenix, AZ 2018
- POMS 29th Annual Conference, Houston, TX 2018

Decision Learning with Menu Optimization
- INFORMS Annual Meeting, Indianapolis, IN 2022
- POMS 32nd Annual Conference, Virtual 2022
- POMS 31st Annual Conference, Virtual 2021

SMOILE: A Shopper Marketing Optimization and Inverse Learning Engine
- ACM SIGKDD, International Conference on Knowledge Discovery & Data Mining, **Link**, Anchorage, AK 2019

Poster Presentations

Note: All posters are available at **parshanpakiman.github.io/presentation**.

- **Self-Guided Approximate Linear Programs**, NeurIPS 2020, Workshop on Self-Supervised Learning, Virtual 2020
- **SMOILE: A Shopper Marketing Optimization and Inverse Learning Engine**, ACM SIGKDD, International Conference on Knowledge Discovery & Data Mining, Anchorage, AK 2019

Service

Conference Organization
- Session co-chair, *Risk Management in Reinforcement Learning*, INFORMS Annual Meeting 2023
- Session co-chair, *Learning and Sequential Decision Making*, INFORMS Annual Meeting 2022
- Session co-chair, *Large-scale Linear Programs and Applications*, INFORMS Optimization Society Conference 2022
- Session chair, *Recent Advances in Reinforcement Learning*, INFORMS Annual Meeting 2021
- Session co-chair, *Social Responsibility and Risk in Supply Chains*, INFORMS Annual Meeting 2021

Reviewer
- INFORMS Journal on Computing 2022
- Information Systems Research 2022
- International Conference on Learning Representations 2021
- Annals of Operations Research 2019 - 2021
- Computers & Operations Research 2019 - 2021
- Electronic Commerce Research 2018 - 2021
- Information Systems and Operational Research 2018

Membership
- Beta Gamma Sigma (BGS) Society 2021 - Present
- Production and Operations Management Society (POMS) 2018 - Present
- Institute for Operations Research and the Management Sciences (INFORMS) 2017 - Present
- INFORMS Chicago Chapter Ambassador 2022

References

- **Dan Adelman**, Charles I. Clough, Jr. Professor of Operations Management, Booth School of Business, The University of Chicago. Email: Dan.Adelman@ChicagoBooth.edu.
- **Selva Nadarajah**, Associate Professor of Operations Management, College of Business Administration, University of Illinois Chicago. Email: SelvaN@UIC.edu.