Yaron Shaposhnik

Assistant professor of Operations Management and Information Systems
Simon Business School, University of Rochester
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Research Interests

Machine learning methodologies and their application for solving business problems, sequential decision-making with uncertainty reduction mechanisms, business analytics

Education

Massachusetts Institute of Technology, Cambridge, MA
PhD in Operations Research; September 2016
Advisors: Professor Retsef Levi and Professor Thomas Magnanti
Dissertation title: "Exploration vs. Exploitation: Reducing Uncertainty in Operational Problems"

Technion – Israel Institute of Technology, Haifa, Israel
M.S. in Industrial Engineering with Honors, February 2010
Advisors: Professor Yale Herer and Dr. Hussein Naseraldin

Technion – Israel Institute of Technology, Haifa, Israel
B.S. in Information Systems Engineering with Honors, March 2005

Professional Experience

2016-present	*Assistant professor*, **University of Rochester**, Rochester, NY
2014-2015	*Teaching assistant*, **Massachusetts Institute of Technology**, Cambridge, MA
2014	*Research intern*, **Brigham and Women's Hospital**, Boston, MA
2011-2016	*Research assistant*, **Massachusetts Institute of Technology**, Cambridge, MA
2010-2011	*Logistics planner*, **Manfrotto Bags**, Jerusalem, Israel
2008-2010	*Teaching assistant*, **Technion – Israel Institute of Technology**, Haifa, Israel
2006-2007	*Software engineer*, **Mind CTI**, Yokneam, Israel

Journal Publications

[10] "Interpretable Prediction Rules for Congestion Risk in ICUs", F. Bravo, C. Rudin, Y. Shaposhnik, and Y. Yuan, accepted to a joint special issue of ***Stochastic Systems*** and ***Service Science***, May 2023.
(editorial boards: https://pubsonline.informs.org/page/stsy/editorial-board, https://pubsonline.informs.org/page/serv/editorial-board)

[9] "Visualizing the implicit model selection tradeoff", Zezhen (Dawn) He and Y. Shaposhnik, ***Journal of Artificial Intelligence Research*** (JAIR, top AI journal), 2023.

[8] "Globally-Consistent Rule-Based Summary-Explanations for Machine Learning Models: Application to Credit-Risk Evaluation", Cynthia Rudin and Y. Shaposhnik, ***Journal of Machine Learning Research*** (JMLR, top ML journal), 2023.

[7] “Scheduling with Testing of Heterogeneous Jobs”, R. Levi, T. Magnanti, and Y. Shaposhnik, accepted to ***Management Science***, October 2022.

[6] “A Polynomial-Time Approximation Scheme for Sequential Batch-Testing of Series Systems”, Danny Segev and Y. Shaposhnik, ***Operations Research***, 2022.

[5] “A Holistic Approach to Interpretability in Financial Lending: Models, Visualizations, and Summary-Explanations”, C. Chen, K. Lin, C. Rudin, Y. Shaposhnik, S. Wang, Sijia and T. Wang, ***Decision Support Systems***, 2022.

- Winner of the 2018 FICO recognition award for the explainable machine learning challenge hosted by FICO, Google, Imperial College London, MIT, University of Oxford, UC Irvine and UC Berkeley.

[4] “Understanding How Dimension Reduction Tools Work: An Empirical Approach to Deciphering t-SNE, UMAP, TriMAP, and PaCMAP for Data Visualization”, joint work with Haiyang Huang, Cynthia Rudin, and Yingfan Wang, ***Journal of Machine Learning Research*** (JMLR, top ML journal), 2021.

- Winner of the 2023 John M. Chambers Statistical Software award (link).

[3] “Mining Optimal Policies: A Pattern Recognition Approach to Model Analysis”, Fernanda Bravo and Y. Shaposhnik, ***INFORMS Journal on Optimization***, 2020 (new INFORMS journal; editorial board: https://pubsonline.informs.org/page/ijoo/editorial-board)

[2] ”Scheduling with Testing”, R. Levi, T. Magnanti, and Y. Shaposhnik, ***Management Science***, 2019.

- The 2015 INFORMS Service Science Section Best Student Paper Award Competition, Finalist
- The 2014 INFORMS Manufacturing and Service Operations Management Society Student Paper Competition, Finalist.

[1] ”Optimal Ordering for a Probabilistic One-time Discount”, Y. Shaposhnik, Y. Herer, and H. Naseraldin, ***European Journal of Operational Research***, 2015.

Working Papers

[a] ”Stochastic Selection Problems with Testing”, C. Attias, R. Krauthgamer, R. Levi, and Y. Shaposhnik,

- Status: reject and resubmit at ***Management Science***.

[b] “Pandora's Box Problem with Sequential Inspections”, with Jingwei Ji and Ali Aouad.

- Status: reject and resubmit at ***Management Science.***

[c] “Waiting-Time Prediction with Invisible Customers”, with Yoav Kerner, Ricky Roet-green, Arik Senderovich, and Yuting Yuan

- Status: major revision at ***Manufacturing & Service Operations Management.***

Work in Progress

- Zezhen (Dawn) He (with Fernanda Bravo and Leon Valdes) – A Behavioral Study of Self-other Adoption Discrepancies in XAI
- Zezhen (Dawn) He (with Fernanda Bravo) – The impact of XAI inconsistencies on user behavior
- Yashi Huang (with Arik Senderovich) – A decision support tool for physician rostering
- Yashi Huang (with Arik Senderovich) – Quantifying the performance gap of ML models for waiting time prediction
- Yashi Huang (with Arik Senderovich) – Explaining delays in service systems

Research Presentations

“A decision support tool for physician rostering” (INFORMS Healthcare Conference 2023*, INFORMS 2023*)

“A Behavioral Study of Self-other Adoption Discrepancies in XAI” (INFORMS 2022*, POMS 2023*)

“Visualizing the implicit model selection tradeoff”, joint work with Zezhen (Dawn) He (INFORMS 2021*, AI in Management 2023*, POMS 2023)

“Understanding How Dimension Reduction Tools Work: An Empirical Approach to Deciphering t-SNE, UMAP, TriMAP, and PaCMAP for Data Visualization”, joint work with Haiyang Huang, Cynthia Rudin, and Yingfan Wang (INFORMS 2020*, presented to the Security, Testing Assessment & Risk department at Morgan Stanley*, seminar at Paris Saclay 2023*)

“Waiting-Time Prediction with Invisible Customers”, joint work with Yoav Kerner, Ricky Roet-green, and Arik Senderovich (INFORMS 2020, U. of Toronto 2021*, POMS 2021*, CORS 2021*, Informs Healthcare 2021* EURO 2021*, INFORMS 2022*)

“Pandora's Box Problem with Sequential Inspections”, with Jingwei Ji and Ali Aouad, (INFORMS 2020*, INFORMS 2022, U. of Luxembourg departmental seminar 2022, Boston college departmental seminar 2023).

“An Interpretable Model with Globally Consistent Explanations for Credit Risk”, C. Chen, K. Lin, C. Rudin, Y. Shaposhnik, S. Wang, Sijia and T. Wang (NIPS 2018*)

“Simple Prediction Rules for Admission Control in Queueing Systems”, Fernanda Bravo, C. Rudin, Y. Shaposhnik, and Yuting Yuan (University of Toronto 2019, POMS 2019*, Informs Healthcare 2019*, INFORMS 2019*)

“Model-Agnostic and Globally-Consistent Rule-Based Explanations with Application to Credit-Risk Evaluation”, Cynthia Rudin and Y. Shaposhnik (Technion Quant seminar 2018, INFORMS 2019, CIST 2019, Tel Aviv University 2020, Ben-Gurion University 2020, INFORMS 2020, Yale SOM 2020, U. of Maine guest speaker in the course *Interpretability and Explainability in Machine Learning* 2021, Duke Fuqua 2021, Boston University IS PhD Seminar 2021, London Business School 2021)

“Discovering Optimal Policies: A Machine Learning Approach to Model Analysis”, F. Bravo and Y. Shaposhnik (University of Pittsburgh 2017, Rochester Institute of Technology 2017, MSOM 2018*, INFORMS 2018*, European Conference on Operational Research 2018*, POMS 2019, Duke Fuqua 2019*)

“A Polynomial-Time Approximation Scheme for Sequential Batch-Testing of Series Systems”, Danny Segev and Y. Shaposhnik (MSOM 2017, POMS Israel 2017, INFORMS 2017, Conference on Optimization and Discrete Geometry: Theory and Practice*, TAU, April 2018, New Challenges in Scheduling Theory*, Aussois, France, April 2018)

“Exploration vs. Exploitation: Reducing Uncertainty in Operational Problems”, C. Attias, R. Krauthgamer, R. Levi, T. Magnanti, and Y. Shaposhnik (Cornell ORIE workshop 2015, Sloan School of Management 2015, Technion 2015, TAU IE seminar 2015, BGU 2015, Duke's Fuqua School of Business 2016, Yale SOM 2016, Eindhoven University of Technology 2016, Columbia DRO 2016, Cornell ORIE 2016, University of Rochester’s Simon Business School 2016, INFORMS 2016)

”When and How to Test in Scheduling Nonhomogeneous Job Classes”, R. Levi, T. Magnanti, and Y. Shaposhnik (MSOM 2015)

”Scheduling with Testing”, R. Levi, T. Magnanti, and Y. Shaposhnik (INFORMS 2013, Technion 2014, Ben Gurion University 2014, IBM Haifa 2014, MSOM 2014, INFORMS 2014)

”Optimal ordering for a probabilistic one-time discount”, Y. Shaposhnik, Y. Herer, and H. Naseraldin (Technion 2009, IE&M 2010, ORT Braude 2010)

* The work was presented by a coauthor

Teaching Experience

2023 (Spring) **University of Rochester**, Rochester, NY
Instructor for **Predictive Analytics using Python.** (149 students, teaching evaluation: 4.62).

2023 (Spring) **University of Rochester**, Rochester, NY
Instructor for a **PhD course on Optimization.**

2023 (Spring) **University of Rochester**, Rochester, NY
Instructor for a **PhD research seminar.**

2022 (Spring) **University of Rochester**, Rochester, NY
Instructor for **Predictive Analytics using Python.** (184 students, teaching evaluation: 4.45).

2022 (Spring) **University of Rochester**, Rochester, NY
Instructor for a **PhD course on Optimization.**

2021 (Summer) **University of Rochester**, Rochester, NY
Instructor for **Predictive Analytics using Python.**

2021 (Spring) **University of Rochester**, Rochester, NY
Instructor for **A PhD seminar on Data Analytics in Operations Management.**

2021 (Spring) **University of Rochester**, Rochester, NY
Instructor for **Predictive Analytics using Python.**
Taught MSBA, MSMA, and MBA students (106 students in total).

2019 (Fall) **University of Rochester**, Rochester, NY
Instructor for **Predictive Analytics using Python.**
Taught 3 sections of MSBA, MSMA, and MBA students (200 students in total).

2019 (Spring) **University of Rochester**, Rochester, NY
Instructor for **Advanced Topics in CIS and OM.**
Co-taught a seminar for students in the Information Systems and Operations Management PhD programs. Designed a module on interpretable/explainable machine learning with applications to predictive and prescriptive analytics models (13 students).

2019 (Winter) **University of Rochester**, Rochester, NY
Instructor for **Predictive Analytics using Python.**
Taught 3 sections of MBA (20 students), MS (93 students), and undergraduate students (44 students).

2018 (Winter) **University of Rochester**, Rochester, NY
Instructor for **Predictive Analytics using Python.**
Taught 3 sections of MBA (14 students), MS (69 students), and undergraduate students (18 students).

2017 (Spring) **University of Rochester**, Rochester, NY
Instructor for **PhD Seminar on Statistical Learning, CIS510.**
A new PhD level introductory course on fundamental machine learning concepts and algorithms. The course was taught in part by myself and in part by the students, with whom I met regularly before class to discuss the teaching plan, and after class to provide feedback on the teaching. Class of 9 students.

2017 (Winter) **University of Rochester**, Rochester, NY
Instructor for **Advanced Business Analytics, CIS442D.**
A new MS level course covering machine learning algorithms and programming tools for data analysis in Python. Designed and constructed the course material, including lecture notes, code for class and homework exercises, and exam. Class of 66 students.

2015 (Summer) **Massachusetts Institute of Technology**, Cambridge, MA
Teaching Assistant for **Introduction to Operations Management, 15.734.**
Executive MBA course on the interplay between strategy and operations, and the tools used to analyze and design core operational capabilities. Responsibilities included teaching recitations, grading cases and assignments, running simulation games, and administrative duties.

2015 (Spring) **Massachusetts Institute of Technology**, Cambridge, MA
Teaching Assistant for **Introduction to Operations Management, 15.761**
Similar to 15.734, intended for students of the MBA program.

2014 (Fall) **Massachusetts Institute of Technology**, Cambridge, MA
Teaching Assistant for **Data, Models, and Decisions, 15.060**.
Core MBA class covering fundamentals of Probability, Modeling, and Optimization. Responsibilities included administrative duties, teaching weekly recitations, grading problem sets and exams, and reviewing students' case studies.

2014 (Spring) **Massachusetts Institute of Technology**, Cambridge, MA
Teaching Assistant for **Optimization Methods in Management Science, 15.053/8**.
Undergraduate/graduate introductory course to the theory, algorithms, and applications of optimization. Responsibilities included administrative duties, teaching weekly recitations, preparing problem sets and exams, grading, and guiding students with their projects.

2009-2010 **Technion – Israel Institute of Technology**, Haifa, Israel
Teaching Assistant for **Supply Chains Management, 94139**.
Undergraduate class introducing students to mathematical models to manage supply chain and solve logistical problems. Responsibilities included teaching weekly recitations, grading, and developing questions for exams.

2009 (Spring) **Technion – Israel Institute of Technology**, Haifa, Israel
Teaching Assistant for **Production Systems Engineering, 97120**.
Graduate level course on the theory and methods for designing and managing serial and assembly lines. I served as a grader for this class.

2008 (Fall) **Technion – Israel Institute of Technology**, Haifa, Israel
Teaching Assistant for **Product Design, 94141**.
Undergraduate course on the different stages and aspects of product design. I taught recitations in class and in computer labs.

Honors and Awards

2023 Winner of the 2023 John M. Chambers Statistical Software award (link).
2018 Explainable machine learning challenge hosted by FICO, Google, Imperial College London, MIT, University of Oxford, UC Irvine and UC Berkeley. Won the FICO recognition award.
2015 The INFORMS Service Science Section Best Student Paper Award Competition, Finalist.
2014 The INFORMS Manufacturing and Service Operations Management Society Student Paper Competition, Finalist.

Service Ad hoc reviewer for Management Science, Operations Research, Manufacturing & Service Operations Management (MSOM), Production and Operations Management, Information Systems, Research, Service Science, Naval Research Logistics (NRL), INFORMS Journal on Computing, Mathematical Methods of Operations Research, European Journal of Operational Research, Journal of Global Optimization, ICIS, INFORMS DM best paper student competition, Business Process Optimization workshop.

Skills *Programming:* Python, Java, C++; *Mathematical Tools:* Matlab, R, Gurobi; *Web:* HTML/CSS, ASP, PHP, Django; *Simulation*: Arena, SimPy; *Planning/Operations*: ToolsGroup DPM (Inventory Mng.), Cognos (BI), Movex (ERP).

Languages Hebrew (native), English (fluent)

Citizenship Citizen of Israel

References

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