

# Shai VARDI

ASSISTANT PROFESSOR

*Management*

**Purdue University**

610 Purdue Mall, West Lafayette IN 47907

## PERSONAL

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## RESEARCH INTERESTS

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**Game theory; market design; resource allocation; online platforms; analytical creativity**

## ACADEMIC EMPLOYMENT

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2018 – present **Purdue University**, West Lafayette, IN

*Management*

ASSISTANT PROFESSOR

2016 – 2018 **California Institute of Technology**, Pasadena, CA

*Social and Information Sciences Laboratory (SISL)*

POSTDOCTORAL SCHOLAR

Mentor: Prof. Adam Wierman

2015 – 2016 **Weizmann Institute of Science**, Israel

*Faculty of Applied Mathematics and Computer Science*

POSTDOCTORAL SCHOLAR

Mentor: Prof. Uriel Feige

## EDUCATION

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2011 – 2015 **Tel Aviv University**, Israel

PHD, *Computer Science*

Thesis: DESIGNING LOCAL COMPUTATION ALGORITHMS AND MECHANISMS.

Advisor: Prof. Yishay Mansour

2009 – 2011 **Tel Aviv University**, Israel

MSC, *Computer Science*, **with honors**

Thesis: LOCAL COMPUTATION ALGORITHMS.

Advisor: Prof. Ronitt Rubinfeld

2002 – 2005 **Rimon School Of Jazz and Contemporary Music**, Israel

JAZZ PERFORMANCE, *Bass*

1998 – 2002 **Tel Aviv University**, Israel

BSC, *Computer Science*, **with honors**

*On excellence scholarship.*

## DISTINCTIONS

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2020	MASTERS OUTSTANDING TEACHER – <i>Purdue University</i>
2020	UNDERGRADUATE OUTSTANDING TEACHER – <i>Purdue University</i>
2016 – 2018	LINDE POSTDOCTORAL FELLOWSHIP IN ECONOMICS AND COMPUTATION
2016	INVITED FELLOW – <i>Simons Institute for the Theory of Computation</i>
2015 – 2016	I-CORE IN ALGORITHMS POSTDOCTORAL FELLOWSHIP
2015	OUTSTANDING TEACHING ASSISTANT IN COMPUTER SCIENCE – <i>Tel Aviv University</i>
2015	DEUTSCH PRIZE IN COMPUTER SCIENCE – <i>Tel Aviv University</i>
2012 – 2015	GOOGLE EUROPE FELLOWSHIP IN GAME THEORY
2011	EXCELLENCE AWARD FOR MSc STUDY AND RESEARCH – <i>Tel Aviv University</i>
2002	DEAN HONORS AWARD – <i>Tel Aviv University</i>
2002	BEST SOFTWARE PROJECT AWARD – <i>Tel Aviv University</i>

## JOURNAL PUBLICATIONS

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Link to [Google Scholar](#)

\* indicates corresponding author

1. Shai Vardi\* and William B. Haskell  
THE PRICE OF FAIRNESS OF SCHEDULING A SCARCE RESOURCE  
*Operations Research, to appear*
2. Thomas Kesselheim, Christos-Alexandros Psomas and Shai Vardi\*  
[ON HIRING SECRETARIES WITH STOCHASTIC DEPARTURES](#)  
*Operations Research, to appear*
3. Palma London\*, Shai Vardi, Reza Eghbali and Adam Wierman  
[BLACK-BOX ACCELERATION OF CONVEX PROGRAM SOLVERS](#)  
*Operations Research, 2024*
4. Junjie Qin, Shai Vardi\* and Adam Wierman  
[MINIMIZATION FRACTIONAL PROPHET INEQUALITIES FOR SEQUENTIAL PROCUREMENT](#)  
*Mathematics of Operations Research, 2024*
5. Yu Su, Shai Vardi\*, Xiaoqi Ren and Adam Wierman  
[COMMUNICATION-AWARE SCHEDULING OF PRECEDENCE-CONSTRAINED TASKS ON RELATED MACHINES](#)  
*Operations Research Letters, 2023*
6. Shai Vardi\*, Alexandros Psomas and Eric Friedman  
[DYNAMIC FAIR RESOURCE DIVISION](#)  
*Mathematics of Operations Research, 2022*
7. Ben Moseley and Shai Vardi\*  
[THE FAIRNESS-EFFICIENCY BALANCE OF ROUND ROBIN SCHEDULING](#)  
*Operations Research Letters, 2022*
8. Palma London\*, Shai Vardi and Adam Wierman  
LOGARITHMIC COMMUNICATION FOR DISTRIBUTED OPTIMIZATION IN MULTI-AGENT SYSTEMS  
*Proceedings of the ACM on Measurement and Analysis of Computing Systems, 2019*
9. Yishay Mansour, Boaz Patt-Shamir and Shai Vardi\*  
CONSTANT-TIME LOCAL COMPUTATION ALGORITHMS  
*Theory of Computing Systems, 2018, invited*

10. Avinatan Hassidim, Yishay Mansour and Shai Vardi\*  
LOCAL COMPUTATION MECHANISM DESIGN  
*ACM Transactions on Economics and Computation*, 2016, **invited**
11. Omer Reingold and Shai Vardi\*  
NEW TECHNIQUES AND TIGHTER BOUNDS FOR LOCAL COMPUTATION ALGORITHMS  
*Journal of Computer and System Sciences*, 2016

## PAPERS UNDER SUBMISSION

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1. Shai Vardi\* and Vidyanand Choudhary  
A RANDOM WALK MODELING FRAMEWORK FOR BOOSTING THE CREATIVITY OF HUMANS AND AI  
*Major revision at Information Systems Research*.
  - SSRN's Top Ten download list for: *PsychRN: Thinking, Reasoning & Decision Making* (June 2024)
  - Presented at Wharton's *2nd Annual Business & Generative AI Workshop* (September 2024)
  - To be presented at *CIST 2024* and *WITS 2024*
2. Chris Parker and Shai Vardi\*  
PURE NASH EQUILIBRIUM MARKET RECOMMENDATIONS  
*Submitted*.
  - Presented at *Twenty-Fifth ACM Conference on Economics and Computation (EC)*, 2024
  - To be presented at *INFORMS 2024*

## OPEDS AND FEATURED

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1. [A bipartisan solution to fix the electoral college](#) (OpEd)  
*The Hill*, 04/02/2019
2. [Expanding the Battleground: A competitive approach to presidential election reform](#)  
*Krannert Journal Spring 2019*

## REFEREED CONFERENCE PUBLICATIONS

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Link to [Google Scholar](#)

1. Thành Nguyen, Alexander Teytelboym and Shai Vardi  
EFFICIENT COMBINATORIAL ASSIGNMENT  
*7th International Workshop on Matching Under Preferences (Match-up)*, 2024
2. Chris Parker and Shai Vardi  
EX-POST EQUILIBRIUM MARKET RECOMMENDATIONS  
*Twenty-Fifth ACM Conference on Economics and Computation (EC)*, 2024
3. Palma London, Shai Vardi and Adam Wierman  
LOGARITHMIC COMMUNICATION FOR DISTRIBUTED OPTIMIZATION IN MULTI-AGENT SYSTEMS  
*SIGMETRICS 2020*
4. Thomas Kesselheim, Christos-Alexandros Psomas and Shai Vardi  
HOW TO HIRE SECRETARIES WITH STOCHASTIC DEPARTURES  
*Conference on Web and Internet Economics (WINE)*, 2019

5. Aleksandr M. Kazachkov and Shai Vardi  
ON TANKING AND COMPETITIVE BALANCE  
*Conference on Algorithmic Decision Theory (ADT), 2019*
6. Shai Vardi  
RANDOMLY COLORING GRAPHS OF LOGARITHMICALLY BOUNDED PATHWIDTH  
*International Conference on Randomization and Computation (RANDOM), 2018*
7. Artur Czumaj, Yishay Mansour and Shai Vardi  
SUBLINEAR GRAPH AUGMENTATION FOR FAST QUERY IMPLEMENTATION  
*Workshop on Approximation and Online Algorithms (WAOA), 2018*
8. Uriel Feige, Boaz Patt-Shamir and Shai Vardi  
ON THE PROBE COMPLEXITY OF LOCAL COMPUTATION ALGORITHMS  
*International Colloquium on Automata, Languages, and Programming (ICALP), 2018*
9. Palma London, Shai Vardi, Adam Wierman and Hanling Yi  
A PARALLELIZABLE ACCELERATION FRAMEWORK FOR PACKING LINEAR PROGRAMS  
*AAAI Conference on Artificial Intelligence, 2018*
10. Omer Tamuz, Shai Vardi and Juba Ziani  
NON-EXPLOITABLE PROTOCOLS FOR REPEATED CAKE CUTTING  
*AAAI Conference on Artificial Intelligence, 2018*
11. Eric Friedman, Christos-Alexandros Psomas and Shai Vardi  
CONTROLLED DYNAMIC FAIR DIVISION  
*ACM Conference on Economics and Computation (EC), 2017*
12. Aviad Rubinfeld and Shai Vardi  
SORTING FROM NOISIER SAMPLES  
*ACM-SIAM Symposium on Discrete Algorithms (SODA), 2017*
13. Yishay Mansour, Boaz Patt-Shamir and Shai Vardi  
CONSTANT-TIME LOCAL COMPUTATION ALGORITHMS  
*Workshop on Approximation and Online Algorithms (WAOA), 2015*
14. Eric Friedman, Christos-Alexandros Psomas and Shai Vardi  
DYNAMIC FAIR DIVISION WITH MINIMAL DISRUPTIONS  
*ACM Conference on Economics and Computation (EC), 2015*
15. Shai Vardi  
THE RETURNING SECRETARY  
*Symposium on Theoretical Aspects of Computer Science (STACS), 2015*
16. Avinatan Hassidim, Yishay Mansour and Shai Vardi  
LOCAL COMPUTATION MECHANISM DESIGN  
*ACM Conference on Economics and Computation (EC), 2014*
17. Yishay Mansour and Shai Vardi  
A LOCAL COMPUTATION APPROXIMATION SCHEME TO MAXIMUM MATCHING  
*Workshop on Approximation Algorithms for Combinatorial Optimization Problems (APPROX), 2013*
18. Yishay Mansour, Aviad Rubinfeld, Shai Vardi and Ning Xie  
CONVERTING ONLINE ALGORITHMS TO LOCAL COMPUTATION ALGORITHMS  
*International Colloquium on Automata, Languages, and Programming (ICALP), 2012*

19. Noga Alon, Ronitt Rubinfeld, Shai Vardi and Ning Xie  
SPACE-EFFICIENT LOCAL COMPUTATION ALGORITHMS  
*ACM-SIAM Symposium on Discrete Algorithms (SODA), 2012*
20. Ronitt Rubinfeld, Gil Tamir, Shai Vardi and Ning Xie  
FAST LOCAL COMPUTATION ALGORITHMS  
*Innovations in Theoretical Computer Science (ITCS), 2011*

## WORKING PAPERS

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1. Thành Nguyen, Alexander Teytelboym and Shai Vardi  
EFFICIENT COMBINATORIAL ASSIGNMENT  
*In preparation.*
2. Thành Nguyen, Alexander Teytelboym and Shai Vardi  
DYNAMIC COMBINATORIAL ASSIGNMENT  
*In preparation.*
3. Shai Vardi and Vidyanand Choudhary  
IS DETECTING FAKE REVIEWS WORTH THE EFFORT?  
*In Preparation.*
4. Shai Vardi and Weilong Wang  
ON THE DESIGN OF WEIGHTED LOTTERIES  
*In Preparation.*
5. Parinaz Naghizadeh, Thành Nguyen and Shai Vardi  
THE IMPACTS OF PREDICTION TECHNOLOGIES ON RELATIONAL CONTRACTS  
*In Preparation.*

## SELECTED INVITED TALKS

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*A Random Walk Modeling Framework for Boosting the Creativity of Humans and AI*

Dec 2024		<b>Workshop on Information Technologies and Systems (WITS)</b>
Oct 2024		<b>Conference on Information Systems and Technology (CIST)</b>
Sept 2024		<b>ISR Analytical Creativity Special Edition Workshop</b>
Sept 2024		<b>Wharton Annual Business &amp; Generative AI Workshop</b>

*Pure Nash Equilibrium Market Recommendations*

Oct 2024		<b>INFORMS Annual Meeting</b>
July 2024		<b>ACM Conference on Economics and Computation (EC)</b>
July 2022		<b>Israel Association for Information Systems (ILAIS) Conference</b>
Dec 2020		<b>Workshop on Information Systems and Economics (WISE)</b>

*Random Combinatorial Assignment*

Aug 2023		<b>YishayFest</b>
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*Is detecting fake reviews worth the effort?*

Apr 2023		<b>Theory in Economics of Information Systems (TEIS)</b>
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*The Impact of Intermediaries on Online Sequential Sales*

Oct 2022		<b>Conference on Information Systems and Technology (CIST)</b>
June 2022		Tel Aviv University

*The Impacts of Prediction Technologies on Relational Contracts*

July 2020 | Indiana University  
Dec 2019 | **Workshop on Information Systems and Economics (WISE)**

*How to Hire Secretaries with Stochastic Departures*

Dec 2019 | **Conference on Web and Internet Economics (WINE)**  
Oct 2019 | **INFORMS Annual Meeting**  
Sep 2019 | Purdue CS Theory seminar

*Non-Exploitable Protocols for Repeated Cake Cutting*

Oct 2018 | **INFORMS Annual Meeting**  
Apr 2018 | **Bellairs Workshop on Algorithmic Game Theory**

*Meeting the Challenges of Massive Networks and Systems (Job talk)*

Dec 2017 | Tel Aviv University  
Dec 2017 | Ben Gurion University  
Dec 2017 | Bar Ilan University  
Dec 2017 | Haifa University  
Dec 2017 | IDC Herzelia  
Nov 2017 | Purdue University

*Dynamic Fair Resource Division*

Apr 2019 | SCOM seminar, Purdue University

*Stepwise Presidential Election Reform*

May 2018 | Caltech SISL seminar

*A Parallelizable Acceleration Framework for Packing Linear Programs*

Feb 2018 | **Information Theory and Applications Workshop**  
Dec 2017 | **Simons Institute Algorithms and Uncertainty Reunion**

*Local Computation Mechanism Design*

Oct 2017 | **INFORMS Annual Meeting**  
Jun 2014 | ACM Conference on Economics and Computation (EC)  
Jun 2014 | **6th Israeli Game Theory conference**  
Feb 2014 | UC Berkeley EconCS seminar  
Feb 2014 | Microsoft Research, Silicon Valley  
Jan 2014 | TAU EconTheory seminar  
Nov 2013 | **Dagstuhl seminar on Electronic Markets and Auctions**

*Local Computation Algorithms on High Degree Graphs*

Oct 2018 | Purdue CS Theory seminar  
Oct 2017 | UCSD Theory seminar  
May 2017 | UW Theory seminar  
Jan 2017 | USC Theory lunch  
Dec 2016 | Caltech Theory seminar  
Oct 2016 | **Workshop on Local Algorithms (WoLA)**

*Controlled Dynamic Fair Division*

Jul 2017 | **Conf. of the Int. Fed. of Operational Research Societies (IFORS)**  
Jun 2017 | ACM Conference on Economics and Computation (EC)  
Apr 2017 | Caltech SISL seminar

Nov 2016 | **SoCal. Symp. on Network Economics and Game Theory (NEGT)**

*Sublinear Graph Augmentation for Fast Query Implementation*

Mar 2018 | **Workshop on Data Summarization**

Oct 2017 | Caltech Theory seminar

*New Techniques and Tighter Bounds for Local Computation Algorithms*

Feb 2016 | University of Wisconsin–Madison Theory seminar

Feb 2016 | CMU Theory seminar

Jan 2016 | **Sublinear Algorithms Workshop**

Oct 2016 | TAU Theory seminar

May 2015 | Weizmann Institute of Science Theory seminar

May 2015 | Ben Gurion University Theory seminar

*The Returning Secretary*

Mar 2015 | STACS

Jan 2015 | TAU Algorithms seminar

Sep 2014 | **China Theory Week**

*Introduction to Local Computation Algorithms*

May 2014 | **French-Israeli Workshop on Foundations of Computer Science (FILOFOCS)**

Feb 2014 | UC Berkeley Theory lunch

May 2013 | Technion Operations Research and Statistics seminar

## PATENTS

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Shai Vardi and Rachel Cummings

NEEDLESTACK—A METHOD FOR PROTECTING BROWSING PRIVACY

*provisional patent, filed 2017*

## SERVICE

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**Program Committee** Conference on Information Systems and Technology (CIST) 2022, 2023, 2024;

ACM Conference on Economics and Computation (EC) 2017, 2018, 2020, 2021;

**Discussant** Decision Sciences Institute (DSI) Conference, 2020;

Theory in Economics of Information Systems (TEIS), 2024.

**Reviewer (J)** Management Science, Information Systems Research (ISR), Mathematics of Operations Research, Operations Research, Journal of Economic Theory, INFORMS Journal on Computing, Transactions on Network Science and Engineering (TNSE), Algorithmica, Journal of Computer and System Sciences (JCSS), Distributed Computing (DIST), Theory of Computing Systems (TOCS), SIAM Journal on Computing (SICOMP) Innovations in Theoretical Computer Science (ITCS).

**Reviewer (C)** ICIS, CIST, WINE, STOC, FOCS, SODA, ICALP, ITCS, SPAA, ESA, DISC, PODC, STACS, SAGT.

## TEACHING

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- 2020 – **Computing for Analytics**, *Purdue University*  
MASTERS OUTSTANDING TEACHER, 2020
- 2018 – **Introduction to Management Information Systems**, *Purdue University*  
UNDERGRADUATE OUTSTANDING TEACHER, 2020
- 2018 **Advanced Topics in MIS** - PhD Doctoral Seminar, *Purdue University*
- 2011 – 2015 Teaching assistant, **Algorithms**, *Tel Aviv University*  
OUTSTANDING TEACHING ASSISTANT IN COMPUTER SCIENCE, 2015
- 2014 Teaching assistant, **Algorithmic Game Theory**, *Tel Aviv University*
- 2010 Teaching assistant, **Data Structures and Algorithms**, *Tel Aviv University*
- 2008 – 2010 Bass and Music Theory, *Ramat Efal Conservatory of Music*
- 2005 – 2007 Music Theory and Jazz, *Arison School of The Arts, Tel Aviv*

## OTHER

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- 2005 – 2010 Composer, performer and educator of Jazz music.