

Shai VARDI

POSTDOCTORAL SCHOLAR

Social and Information Sciences Laboratory

California Institute of Technology

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PERSONAL

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RESEARCH INTERESTS

Large-scale optimization; dynamic systems; fair division.

I am interested in solving problems arising from the rapid growth in the size of networks, and in resource allocation in dynamic systems. In particular, my research interests include local computation algorithms, distributed optimization, dynamic fair division, algorithmic game theory, online algorithms, secretary algorithms and prophet inequalities, and Markov chain Monte Carlo (MCMC) methods.

ACADEMIC EMPLOYMENT

2016 – present **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

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

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

JOURNAL PUBLICATIONS

Link to [Google Scholar](#)

1. Yishay Mansour, Boaz Patt-Shamir and Shai Vardi
CONSTANT-TIME LOCAL COMPUTATION ALGORITHMS
Theory of Computing Systems, 2017, **invited**
2. Avinatan Hassidim, Yishay Mansour and Shai Vardi
[LOCAL COMPUTATION MECHANISM DESIGN](#)
ACM Transactions on Economics and Computation, 2016, **invited**
3. Omer Reingold and Shai Vardi
NEW TECHNIQUES AND TIGHTER BOUNDS FOR LOCAL COMPUTATION ALGORITHMS
Journal of Computer and System Sciences, 2016

REFEREED CONFERENCE PUBLICATIONS

Link to [Google Scholar](#)

1. Uriel Feige, Boaz Patt-Shamir and Shai Vardi
[ON THE PROBE COMPLEXITY OF LOCAL COMPUTATION ALGORITHMS](#)
submitted, 2017
2. Palma London, Niangjun Chen, Shai Vardi and Adam Wierman
DISTRIBUTED OPTIMIZATION VIA LOCAL COMPUTATION ALGORITHMS
submitted, 2017
3. Thomas Kesselheim, Christos-Alexandros Psomas and Shai Vardi
HOW TO HIRE SECRETARIES WITH STOCHASTIC DEPARTURES
submitted, 2017
4. Artur Czumaj, Yishay Mansour and Shai Vardi
SUBLINEAR GRAPH AUGMENTATION FOR FAST QUERY IMPLEMENTATION
submitted, 2017
5. Junjie Qin, Ram Rajagopal, Shai Vardi and Adam Wierman
CONVEX PROPHET INEQUALITIES
submitted, 2017
6. Shai Vardi
RANDOMLY COLORING GRAPHS OF LOGARITHMICALLY BOUNDED PATHWIDTH
submitted, 2017
7. Palma London, Shai Vardi, Adam Wierman and Hanling Yi
A PARALLELIZABLE ACCELERATION FRAMEWORK FOR PACKING LINEAR PROGRAMS
AAAI Conference on Artificial Intelligence, 2018, to appear

8. Omer Tamuz, Shai Vardi and Juba Ziani
NON-EXPLOITABLE PROTOCOLS FOR REPEATED CAKE CUTTING
AAAI Conference on Artificial Intelligence, 2018, to appear
9. Eric Friedman, Christos-Alexandros Psomas and Shai Vardi
[CONTROLLED DYNAMIC FAIR DIVISION](#)
ACM Conference on Economics and Computation (EC), 2017
10. Aviad Rubinstein and Shai Vardi
SORTING FROM NOISIER SAMPLES
ACM-SIAM Symposium on Discrete Algorithms (SODA), 2017
11. Yishay Mansour, Boaz Patt-Shamir and Shai Vardi
CONSTANT-TIME LOCAL COMPUTATION ALGORITHMS
Workshop on Approximation and Online Algorithms (WAOA), 2015
12. Eric Friedman, Christos-Alexandros Psomas and Shai Vardi
DYNAMIC FAIR DIVISION WITH MINIMAL DISRUPTIONS
ACM Conference on Economics and Computation (EC), 2015
13. Shai Vardi
THE RETURNING SECRETARY
Symposium on Theoretical Aspects of Computer Science (STACS), 2015
14. Avinatan Hassidim, Yishay Mansour and Shai Vardi
LOCAL COMPUTATION MECHANISM DESIGN
ACM Conference on Economics and Computation (EC), 2014
15. Yishay Mansour and Shai Vardi
A LOCAL COMPUTATION APPROXIMATION SCHEME TO MAXIMUM MATCHING
Workshop on Approximation Algorithms for Combinatorial Optimization Problems (APPROX), 2013
16. Yishay Mansour, Aviad Rubinstein, Shai Vardi and Ning Xie
CONVERTING ONLINE ALGORITHMS TO LOCAL COMPUTATION ALGORITHMS
International Colloquium on Automata, Languages, and Programming (ICALP), 2012
17. Noga Alon, Ronitt Rubinfeld, Shai Vardi and Ning Xie
SPACE-EFFICIENT LOCAL COMPUTATION ALGORITHMS
ACM-SIAM Symposium on Discrete Algorithms (SODA), 2012
18. Ronitt Rubinfeld, Gil Tamir, Shai Vardi and Ning Xie
FAST LOCAL COMPUTATION ALGORITHMS
Innovations in Theoretical Computer Science (ITCS), 2011

PATENTS

Shai Vardi and Rachel Cummings
NEEDLESTACK—A METHOD FOR PROTECTING BROWSING PRIVACY
provisional patent, filed 2017

SELECTED INVITED TALKS

Meeting the challenges of massive networks and systems

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

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
June 2014	ACM Conference on Economics and Computation (EC)
June 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 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

July 2017	Conf. of the Int. Fed. of Operational Research Societies (IFORS)
June 2017	ACM Conference on Economics and Computation (EC)
April 2017	Caltech SISL seminar
Nov 2016	SoCal. Symp. on Network Economics and Game Theory (NEGT)

Sublinear Graph Augmentation for Fast Query Implementation

March 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

SERVICE

PC Reviewer	ACM Conference on Economics and Computation (EC) 2017, 2018 Algorithmica, Transactions on Network Science and Engineering (TNSE), Journal of Computer and System Sciences (JCSS), Distributed Computing (DIST), Theory of Computing Systems (TOCS), Theoretical Computer Science (TCS).
Subreviewer	SODA, ICALP, SPAA, ESA, DISC, PODC, STACS, SAGT.

TEACHING

2011 – 2015	Teaching assistant, Algorithms , <i>Tel Aviv University</i> OUTSTANDING TEACHING ASSISTANT IN COMPUTER SCIENCE, 2015 TEACHING EVALUATIONS: <i>typically top 10% in overall assessment</i>
2014	Teaching assistant, Algorithmic Game Theory , <i>Tel Aviv University</i>
2010	Teaching assistant, Data Structures and Algorithms , <i>Tel Aviv University</i>
2008 – 2010	Bass and Music Theory, <i>Ramat Efal Conservatory of Music</i>
2005 – 2007	Music Theory and Jazz, <i>Arison School of The Arts, Tel Aviv</i>

STUDENTS

I have worked with the following students at Caltech:

Graduate students

Palma London	LCAs, distributed optimization and large LPs
Juba Ziani	Dynamic fair division

Undergraduate students

Gavy Aggrawal	Browser privacy project in CS141
Jake Harmon	
Jaden Geller	
Mizing Paloian	
Kyle Sepp	

OTHER

2005 – 2010	Composer, performer and educator of Jazz music. I played on several records and at many venues, including international jazz festivals, and with world-renowned jazz musicians. I formed and led my own band, Dreaming Elephants, and also gained critical success with another band I co-led, Jazz 'n Roll.
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