

Yaniv Altshuler

MIT Media Lab, E15-388
77 Massachusetts Avenue
Cambridge, MA, 02139
yanival@mit.edu

Research Interests

Social Physics, Big Data, Network Analysis, Collective Intelligence, Urban Computing, Collaborative Security

Academic

Since 2014:	Research Affiliate	Media Lab, MIT
2011 – 2013:	Post-Doc	Media Lab, MIT City Science Center, Affiliate
	Research Topic:	Information Flow in Networks and Communities
	Supervisor:	Prof. Alex (Sandy) Pentland
2010:	Post-Doc	Deutsche Telekom Research Laboratories, BGU
	Research Topic:	Collaborative and Swarm Algorithms for Security and Privacy
	Supervisor:	Assoc. Prof. Yuval Elovici
2004 – 2010:	Ph.D.	Computer Science Department, Technion – Israel Institute of Technology
	Thesis:	Multi-Agent Robotics in Dynamic Environments
	Advisor:	Prof. Alfred M. Bruckstein Dr. Israel A. Wagner (IBM Research)
2001 - 2003:	B.A.	(<i>Suma Cum Laude</i>), Computer Science Department, Technion – Israel Institute of Technology, Israel
	Alumnus	<i>Stanley Chais Excellence Program</i>

Publications

Published Journal Papers

1. *Campaign Optimization through Behavioral Modeling and Mobile Network Analysis*
Y. Altshuler, E. Shmueli, G. Zyskind, O. Lederman, N. Oliver, A. Pentland, *IEEE Trans. Computational Social Systems*, 2014
2. *Prospect Theory for Online Financial Trading*
YY Liu, JC Nacher, T Ochiai, M Martino and **Y Altshuler**, *PLOS ONE*, 2014
3. *The Social Amplifier – Reaction of Human Communities to Emergencies*
Y. Altshuler, M. Fire, E. Shmueli, Y. Elovici, A. Bruckstein, A. Pentland and D. Lazer, *Journal of Statistical Physics*, 2013
4. *Augmented Betweenness Centrality for Environmentally-Aware Traffic Monitoring in Transportation Networks*
R. Puzis, **Y. Altshuler**, Y. Elovici, S. Bekhor, Y. Shifan and A. Pentland, *Journal of Intelligent Transportation Systems*, 2013
5. *Stealing Reality: When Criminals Become Data Scientists (or Vice Versa)*
Y. Altshuler, N. Aharony, Y. Elovici, A. Pentland and M. Cebrian, *IEEE Intelligent Systems*, 2011
6. *Static and Expanding Grid Coverage with Ant Robots : Complexity Results*
Y. Altshuler and A. Bruckstein, *Theoretical Computer Science (TCS)*, 2011
7. *Multi-agent Cooperative Cleaning of Expanding Domains*
Y. Altshuler, V. Yanovski, I. Wagner, and A. Bruckstein, *International Journal of Robotic Research*, 2010
8. *Cooperative Cleaners: A Study in Ant Robotics*
I. Wagner, **Y. Altshuler**, V. Yanovski and A. Bruckstein, *International Journal of Robotic Research*, 2008
9. *Efficient Cooperative Search of Smart Targets Using UAV Swarms*
Y. Altshuler, V. Yanovski, I. Wagner and A. Bruckstein, *ROBOTICA*, 2008
10. *Workforce Optimization: Identification and Assignment of Professional Workers Using Constraint Programming*
Y. Naveh, Y. Richter, **Y. Altshuler**, D. Gresh and D. Connors, *IBM Journal of R&D*, 2007
11. *Multi-agent Physical A* with Large Pheromones*
A. Felner, Y. Shoshani, **Y. Altshuler** and A. Bruckstein, *Journal of Autonomous Agents and Multi Agents Systems*, 2006

12. *A Novel Linear Coder Nomenclature for Complex Carbohydrates*
E.Banin, Y.Neuberger, **Y.Altshuler**, A.Halevi, O.Inbar, N.Dotan, A. Dukler, Trends in Glycoscience and Glycotechnology, 2002

Books

1. *Swarms and Network Intelligence in Search*, Springer Publishing, 2018
Y. Altshuler, A. Pentland and A. Bruckstein
2. *Security and Privacy in Social Networks*, Springer Publishing, 2012
Y. Altshuler, Y. Elovici, A. Cremers, N. Aharony and A. Pentland (Editors)

Book Chapters

1. *Campaign Optimization through Mobility Network Analysis*
Y. Altshuler, E. Shmueli, G. Zyskind, O. Lederman, N. Oliver and A. Pentland, Geo-Intelligence and Visualization through Big Data Trends, Advances in Geospatial Technologies (AGT) Book Series, 2015
2. *On the Rationality and Optimality of Transportation Networks Defense—a Network Centrality Approach*
Y. Altshuler, R. Puzis, Y. Elovici, S. Bekhor and A. Pentland, Securing Transportation Systems, Protecting Critical Infrastructures Series, Willey, 2014
3. *TTLed RandomWalks for Collaborative Monitoring in Mobile and Social Networks*
Y. Altshuler, S. Dolev and Y. Elovici, Handbook of Optimization in Complex Networks, Springer, 2012
4. *Swarm Intelligence – Searchers, Cleaners and Hunters*
Y. Altshuler, I. Wagner, V. Yanovski and A. Bruckstein, Studies in Computational Intelligence, Springer, 2006

Refereed Conference Papers

1. *Social Behavior Bias and Knowledge Management Optimization*
Y. Altshuler, A. Pentland and G. Gordon, SBP 2015
2. *Ride Sharing: A Network Perspective*
E. Shmueli, I. Mazei, L. Radaelli, A. Pentland and **Y. Altshuler**, SBP 2015
3. *Temporal Dynamics of Scale-Free Networks*
E. Shmueli, **Y. Altshuler** and A. Pentland, SBP 2014
1. *Detecting Anomalous Behaviors Using Structural Properties of Social Networks*
Y. Altshuler, M. Fire, E. Shmueli, Y. Elovici, A. Bruckstein, A. Pentland and D. Lazer, SBP 2013
2. *Trade-offs in Social and Behavioral Modeling in Mobile Networks*
Y. Altshuler, M. Fire, N. Aharony, Z. Volkovich, Y. Elovici and Alex Pentland, SBP, 2013
3. *Decoding Social Influence and the Wisdom of the Crowd in Financial Trading Network*
W. Pan, **Y. Altshuler** and A. Pentland, IEEE Social Computing, 2012
4. *Trends Prediction Using Social Diffusion Models*
Y. Altshuler, W. Pan and A. Pentland, SBP, 2012
5. *How Many Makes a Crowd? On the Correlation between Groups' Size and the Accuracy of Modeling*
Y. Altshuler, M. Fire, N. Aharony, Y. Elovici and A. Pentland, SBP, 2012
6. *The Complexity of Grid Coverage by Swarm Robotics*
Y. Altshuler and A.M. Bruckstein, ANTS (International Conference on Swarm Intelligence), 2010
7. *Collaborative Exploration in Grid Domains*
Y. Altshuler, I. Wagner, and A. Bruckstein, ICINCO, 2009
8. *Swarm Ant Robotics for a Dynamic Cleaning Problem - Upper Bounds*
Y. Altshuler, V. Yanovski, I. Wagner, and A. Bruckstein, ICARA, 2009
9. *Swarm Ant Robotics for a Dynamic Cleaning Problem - Analytic Lower Bounds and Impossibility Results*
Y. Altshuler, V. Yanovski, I. Wagner, and A. Bruckstein, ICARA, 2009
10. *On Minimal Perimeter Polyminoes*
Y. Altshuler, V. Yanovski, D. Vainsencher, I. Wagner and A. Bruckstein, Discrete Geometry for Computational Imagery, 2006
11. *On the Complexity of Physical Problems and a Swarm Algorithm for k-Clique Search in Physical Graph*
Y. Altshuler, A. Matsliah and A. Felner, ECCS, 2005
12. *Swarm Robotics for a Dynamic Cleaning Problem*
Y. Altshuler, I. Wagner and A. Bruckstein, IEEE Swarm Intelligence Symposium, 2005

Refereed Workshop Papers

1. *Using Social Physics to Predict Consumer Behavior*
Y. Altshuler and A. Boehme, NetSci, 2017
2. *From Individual Knowledge Management to Social Information Flow*
Yaniv Altshuler, Alex Pentland and Goren Gordon, ICCSS, 2015
3. *The Network Dimension of Ride Sharing*
Tal Altshuler, Yoram Shiftan, Rachel Katoshevski, Nuria Oliver, Alex Pentland, Erez Shmueli, **Yaniv Altshuler**, ICCSS, 2015
4. *Campaign Optimization through Mobility Network Analysis*
Y. Altshuler, E. Shmueli, G. Zyskind, O. Lederman, N. Oliver, A. Pentland, NetMob, 2015
5. *Network Tuning*
Y. Altshuler and A. Pentland, NetSci, 2015
6. *From Individual Knowledge Management to Social Information Flow*
Y. Altshuler, A. Pentland and G. Gordon, NetSci, 2015
7. *Ride Sharing: A Network Perspective*
E. Shmueli, I. Maze, A. Pentland, T. Altshuler and **Y. Altshuler**, NetSci, 2015
8. *Mobile Phones for On-Demand Public Transportation*
T. Altshuler, Y. Shiftan, R. Katoshevski, N. Oliver, A. Pentland and **Y. Altshuler**, NetSci, 2014
9. *A Generative Model for Evolving Scale-Free Networks*
E. Shmueli, **Y. Altshuler** and A. Pentland, NetSci, 2014
10. *Wisdom of the Network*
E. Shmueli, D. Margolin, **Y. Altshuler**, A. Pentland and D. Lazer, NetSci, 2014
11. *Dynamics of Scale-Free Networks*
E. Shmueli, **Y. Altshuler** and A. Pentland, Workshop on Information in Networks (WIN), 2013
12. *Accurate Decision Making in Social Networks*
Y. Altshuler and A. Pentland, NetSci, 2013
13. *Temporal Percolation in Scale-Free Networks*
E. Shmueli, **Y. Altshuler** and A. Pentland, NetSci, 2013
14. *The Social Amplifier – Reaction of Human Communities to Emergencies*
Y. Altshuler, M. Fire, E. Shmueli, Y. Elovici, A. Bruckstein, A. Pentland and D. Lazer, NetMob, 2013
15. *Trends Prediction in Social Networks Using Influence Diffusion Models*
Y. Altshuler, W. Pan and A. Pentland, Interdisciplinary Workshop on Decisions in Networks (WIDS), 2012
16. *Incremental Learning with Accuracy Prediction of Social and Individual Properties from Mobile-Phone Data*
Y. Altshuler, N. Aharony, M. Fire, Y. Elovici and A. Pentland, WS3P, IEEE Social Computing, 2012
17. *Trends Prediction Using Social Diffusion Models*
Y. Altshuler, W. Pan and A. Pentland, NetSci, 2012
18. *Real World Anomalous Events Detection Based on Social Signals in Mobile Networks Traffic*
Y. Altshuler, A. Pentland, A. Bruckstein, M. Fire, Y. Elovici and D. Lazer, NetSci, 2012
19. *What's the Problem? Using the Internet to Explain Transport Network Anomalies*
F. Pereira, **Y. Altshuler**, NetSci, 2012
20. *Decoding Social Influence in Speculation from Social Trading*
W. Pan, **Y. Altshuler**, A. Pentland, NetSci, 2012
21. *Traffic Assignment Model Based on Betweenness*
R. Puzis, **Y. Altshuler**, Y. Elovici, S. Bekhor, Y. Shiftan and A. Pentland, NetSci, 2012
22. *Information Flow in Networks : Trendsetters, Bellwethers and Shepherd Dogs*
Y. Altshuler and A. Pentland, Workshop on Information in Networks (WIN), 2011
23. *Stealing Reality: When Criminals Become Data Scientists*
Y. Altshuler, N. Aharony, Y. Elovici, A. Pentland and M. Cebrian, Workshop on Information in Networks (WIN), 2011
24. *Augmented Betweenness Centrality for Mobility Prediction in Transportation Networks*
Y. Altshuler, R. Puzis, Y. Elovici, S. Bekhor and A. Pentland, Finding Patterns of Human Behaviors in Network and Mobility Data (NEMO), 2011
25. *Information Flow in Networks : Trendsetters, Bellwethers and Shepherd Dogs*
Y. Altshuler and A. Pentland, Interdisciplinary Workshop on Decisions in Networks (WIDS), 2011
26. *Stealing Reality*
Y. Altshuler, N. Aharony, M. Cebrian, Y. Elovici, A. Pentland, Workshop on Information in Networks (WIN), 2010
27. *Efficient Collaborative Application Monitoring Scheme for Mobile Networks*
Y. Altshuler, S. Dolev, Y. Elovici and N. Aharony, Analysis of Mobile Phone Networks, NetMob (in NetSci), 2010
28. *TTLed Random Walks for Collaborative Monitoring*
Y. Altshuler, S. Dolev, Y. Elovici and N. Aharony, NetSciCom (in IEEE INFOCOM), 2010
29. *To Add With Caution - Decreasing a Swarm Robotics' Efficiency by Imprudently Enhancing the Robots' Capabilities*

- Y. Altshuler**, I. Wagner, and A. Bruckstein, ICINCO (MARS Workshop), 2007
30. *Ant - Swarm Robotics for a Dynamic Cleaning Problem*
Y. Altshuler, I. Wagner, V. Yanovski and A. Bruckstein, ROBOMAT, 2007
31. *Shape Factor's Effect on a Dynamic Cleaners Swarm*
Y. Altshuler, I. Wagner and A. Bruckstein, ICINCO (MARS Workshop), 2006
32. *On Swarm Optimality in Dynamic and Symmetric Environments*
Y. Altshuler, I. Wagner and A. Bruckstein, ICINCO (MARS Workshop), 2005
33. *The Cooperative Hunters - Efficient Cooperative Search for Smart Targets Using UAV Swarms*
Y. Altshuler, I. Wagner, V. Yanovski and A. Bruckstein, ICINCO (MARS Workshop), 2005

Reviewer for Scientific Journals

1. IEEE Intelligent Systems (IIS)
2. Journal of Information Systems Research (ISR)
3. Journal of Intelligent Transportation Systems (JITS)
4. Journal of Transport Policy (JTRP)
5. Theory of Computing Systems (TOCS)
6. Information Sciences
7. Robotics (MDPI Open Access Journal)
8. Theoretical Computer Science (TCS)
9. IEEE Virtual Reality
10. International Journal of Robotics Research (IJRR)
11. Journal of Autonomous Agents and Multi Agents Systems (JAAMAS)
12. Journal of Intelligent and Robotic Systems (JINT)
13. Computational Geometry – Theory and Applications (CGTA)

Scientific Program Committees

1. The 2013 International Conference on Social Computing, Behavioral-Cultural Modeling, & Prediction (SBP 2013)
2. *3rd Workshop on Security and Privacy in Social Networks* (in IEEE SocialCom 2012)
 Workshop Organizer, with Y. Elovici (BGU), A. Cremers (University of Bonn) and A. Pentland (MIT)
3. *9th International Conference on Mobile Web Information Systems*, 2012, PC
4. *2nd Workshop on Security and Privacy in Social Networks* (in IEEE SocialCom 2011)
 Workshop Organizer, with Y. Elovici (BGU) and N. Aharony (MIT)
5. *Social Connections in the Urban Space* (Workshop in SocialCom 2011), PC
6. *Machine Learning and Data Mining in and around Games workshop* (Workshop in ECML 2011), PC
7. *Workshop on Collaborative Methods for Security and Privacy* (in USENIX Security 2010)
 Workshop Organizer, with Y. Elovici (BGU) and N. Aharony (MIT)
8. *Machine Learning and Games* (Workshop in International Conference on Machine Learning (ICML) 2010), PC
9. *1st Workshop on Leveraging Social Patterns for Security, Privacy and Network Architectures* (in IEEE SocialCom 2009)
 Workshop Organizer, with D.P. Reed (MIT), N. Aharony (MIT), K.H. Lee (MIT) and Y. Elovici (BGU)

Patent Applications

1. *System and Method for Dynamically Optimizing TCP Windows Size* (US 12/369,756)
2. *Method and System for Optimizing Quality of Service over a Data Network* (IL 190057)
3. *Method and System for Optimizing Performance through Stochastic Change* (PCT/IL2009/000254)
4. *Method and Computer Program Product for Job Selection and Resource Allocation of a Massively Parallel Processor* (US 2008/0178,187)
5. *System and Method for a Gaming Community* (U.S 12/538,898)
6. *Technological Platform for Interactive Gaming* (PCT/IL2009/000260 and U.S 12/922,175)
7. *Selection System for Gaming* (PCT No. PCT/IL2009/000258 and U.S 12/922,176)
8. *Method and System for Representing Game Data in a Generic Form* (IL 190111)
9. *Reliable, efficient and low cost method for game audio rendering* (US 12/365,298)
10. *Prediction and Inducement of Dynamic Users Behaviors in Computer Games* (U.S 61/229,264)

11. *Apparatus and Method for Targeted Advertisement* (PCT/IL2008/001335)
12. *System and method for efficient collaborative identification of malicious applications in a communication network* (IL 202085)
13. *A system for fault tolerant collaborative identification of malicious applications in a communication network* (IL 202086)
14. *System and Method for Optimizing Social-Influence Based Campaigns in Networks* (U.S Provisional Application 61537539)
15. *Methods and apparatus for prediction and modification of behavior in networks* (U.S 13482925)

Teaching Experience

- Lecturer (2010) :
 - Computability Theory
 - Introduction to Digital Systems
 - Algorithms in Graph Theory and Data Structures
- Co-Advisor of graduation projects (over 20 projects) (2005 – 2009):
 - Project in Image Processing and Analysis.
 - Project in Artificial Intelligence.
 - Project in Intelligent Systems.
- Teaching Assistance (2003 – 2008):
 - Computer Organization and Programming (2003\4\8).
 - Introduction to Robotics (2007\8).

Industry

- **2014 –** : **Endor**
- **2007 – 2010** : **Memoraze**
- **2004 – 2007** : **IBM Haifa Research Labs**
- **2001 – 2004** : **Rafael Advanced Defense Systems**
- **2000 – 2001** : **Glycominds**

Other Media Coverage of Research Results

Research Title	Date	Publication
Social Physics based Endor was awarded “Technological Pioneer” by the World Economic Forum	June, 2017	<i>World Economic Forum</i>
Social Physics based Endor was awarded “Cool Vendor” by Gartner	May, 2017	<i>Gartner</i>
Endor emerges from MIT research with unique predictive analytics tech	March, 2017	<i>TechCrunch</i>
Beyond the Echo Chamber	October, 2013	<i>Harvard Business Review</i>
Detecting emergencies through cell phone usage	July 29, 2013	<i>Jerusalem Post</i>
Can an Algorithm Prevent Terrorist Attacks?	July 28, 2013	<i>Globes</i>
Emergency Alert Study Reveals Metadata’s Better Side	July 25, 2013	<i>IEEE Spectrum</i>
Crowdsourcing Your Investments: The Twitter Effect	May 10, 2013	<i>MainStreet.com</i>
Hacked and hoaxed: Twitter feed roils market	April 24, 2013	<i>The Globe</i>
Markets Insight: Wake up to the Twitter effect on markets	April 18, 2013	<i>Financial Times</i>
Can Trading be Sustainable?	March 28, 2013	<i>Yahoo! Finance, regarding Interview with eToro</i>
MIT’s \$1 million test to see if social media can make investors money	February 14, 2013	<i>Yahoo! Finance QUARTZ</i>
Athena Asia : Wisdom of the Crowd	January 4, 2013	<i>Hong Kong Economic Journal</i>
Elevating the Wisdom of the Crowd	November 13, 2012	<i>Press Conference at the Hong Kong Chambers of Commerce</i>
Next Generation of Financial Trading	November 12, 2012	<i>Cover page of the technology section of the largest daily newspaper in Hong Kong</i>
‘Tuning’ Social Networks Improves Financial Performance on eToro Social Investment	May 9, 2012	<i>Over 20 financial and technological news site and blogs</i>
Is social networking while investing bad for your wallet?	November 16 2011	<i>Reuters, Yahoo Finance, G7-Finance.com, and various others</i>
Influence of Social Networks on Financial Trading	October 2011	<i>Over 60 Media References, including Fox28, NBC12, and more.</i>
Stealing Reality	October 2010	<i>AOL News Communications of the ACM Science 2.0 PC World MSNBC Technology and Science Digg Technology Review TechWorld Kurzweil Accelerating Intelligence Homeland Security Newswire Molecular Station MMC News Ecommerce Journal Science Daily Network Worlds MYCE Space City Science News FDRadio Computerworld blogs</i>

		<i>Wilder Security Forums</i>
		<i>The Santos Republic</i>
		<i>eCRM Guide</i>
		<i>L`Atelier</i>
		<i>Ncoutlander</i>
		<i>Smart Planet</i>
		<i>Help Net Security</i>
		<i>Dark Government</i>
		<i>Dark Reading</i>
		<i>News From The Shack</i>
		<i>Before It's News</i>
		<i>BNET</i>
		<i>DailyKos</i>
		<i>ActivistPost</i>
		<i>ChattahBox</i>
		<i>RXPG News</i>
		<i>Innovation Toronto</i>
Innovative Epidemics Simulator	August 2004	<i>Ynet</i>
	August 2004	" <i>Science News</i> ", Israeli T.V Science Channel
	July 2004	<i>NRG</i>
	June 2004	<i>Hayadan</i>