Rami Puzis **May, 2016**

CURRICULUM VITAE

- **Personal Details**

Name:	Rami Puzis
Date and place of birth:	05 January 1980, Odessa
Date of immigration:	September 1990
Regular military service:	18 Feb. 1999 – 10 Feb. 2002
Address at work:	P.O.B. 653 Beer-Sheva 84105 Israel
Phone at work:	+972-544-764010
Address at home:	haMeleh Yerovam 7/7, Ashdod, 77487, Israel

- **Education**

B.Sc. - 2002-2007, Ben-Gurion University, Software Engineering
(Summa Cum Laude)

M.Sc. - 2006-2007, Ben-Gurion University, Information Systems Engineering
Advisors: Prof. Yuval Elovici, Prof. Shlomi Dolev
Title: Optimization of DNIDS Deployment Strategy in Large Scale Communication Networks
(Magna Cum Laude)

Ph.D. - 2007-2010, Ben-Gurion University, Information Systems Engineering
Advisors: Prof. Yuval Elovici, Prof. Shlomi Dolev
Title: Optimization of DNIDS Deployment Strategy in Large-Scale Communication Networks
(Summa Cum Laude)

P.D - 2011-2012, University of Maryland Institute for Advanced Computer Studies (UMIACS)
Post doctorate research associate
Advisor: Prof. V.S. Subrahmanian

- **Employment History**

Jun 2015-now Senior Lecturer
Ben-Gurion University of the Negev

2012-2015 Lecturer
Ben-Gurion University of the Negev

2007-2011 Research project manager
Deutsche Telecom Laboratories at Ben-Gurion University

2006-2007 Development team leader
Deutsche Telecom Laboratories at Ben-Gurion University

2005-2006 Research assistant
Deutsche Telecom Laboratories at Ben-Gurion University

2003-2005 Freelance developer
Intersol Ltd., Micronet Ltd., Ahva Academic College, Wu-Shu Federation of Israel

2002-2006 Instructor
Wu-Shu Federation of Israel

• **Professional Activities**

(a) Positions in academic administration

2014, Analysis and design curriculum committee member,
Ben-Gurion University, Information Systems Engineering.

2014-2016, Head of teaching committee for graduate studies,
Ben-Gurion University, Information Systems Engineering.

2016, Information security committee member,
Ben-Gurion University.

(d) Editor or member of editorial board of scientific or professional journal

Program Committee Member: IJCAI 2016, New York City, US, 9-15 July, 2016.

Program Committee Member: SwSTE 2016, Beer-Sheva, Israel, 16-17 June, 2016.

Program Committee Member: AAAI 2014, Québec City, Canada, 27-31 July, 2014.

Program Committee Member: Security and Privacy in Social Networks (SPSN 2011), MIT, Boston, MS, USA, 3-6 September, 2012.

Program Committee Member: ACE/IEEE International Conference on Social Computing (SocialCom 2012), Amsterdam, The Netherlands, 3-6 September, 2012.

Program Committee Member: The 2012 International Symposium on Privacy and Security in Cloud and Social Networks (PriSecCSN2012), Xiangtan, Hunan, China, 1-3 November 2012.

Program Committee Member: Security and Privacy in Social Networks (SPSN 2011), MIT, Boston, MS, USA, 9-11 October, 2011.

Program Committee Member: Swarm, Amorphous, Spatial, and Complex Systems Track of the 12th International Symposium on Stabilization, Safety, and Security of Distributed Systems (SSS 2010), New York City, USA, 20-22 September 2010.

(e) Ad-hoc reviewer for journals

Science Magazine
Journal of Graph Algorithms and Applications
BMC Bioinformatics
Emerald Internet Research
Springer Distributed and Parallel Databases
Cambridge Journals Network Science
IEEE Transactions on Knowledge and Data Engineering
IEEE Transactions on Cloud Computing
IEEE Transaction on Computers
Elsevier European Journal of Operational Research
Elsevier Discrete Applied Mathematics
Elsevier Discrete Applied Mathematics
Elsevier Computer Networks

Elsevier Information Systems
ACM Transactions on Intelligent Systems and Technology
ACM Transactions on Internet Technology

• Educational activities

(a) Courses taught

Final Engineering Project Seminar	Undergraduate	Ben-Gurion University
Introduction to Complex Networks	Undergraduate	Ben-Gurion University
Systems Security Engineering	Graduate	Ben-Gurion University
Analysis and Design of Software Systems	Undergraduate	Ben-Gurion University
Complex Networks Analysis	Graduate	Ben-Gurion University
Complex Networks Analysis	Undergraduate	Ben-Gurion University

(b) Research students (past)

	Name	Degree	Topic	Graduated	With
1	Liron Samama	M.Sc.	*Targeted Crawling in Social Networks*	2014	Ariel Felner Roni Stern.
2	Lina Shlangman	M.Sc.	*Incentives in Collaborative Systems*.	2015	
3	Luiza Nahshon	M.Sc.	*Optimizing resources spent on traffic monitoring in Software Defined Networks*.	2015	
4	Shaked Zimmermann	M.Sc.	*Detecting Cyber-Attack on Routers using Honeypots and Configuration Validation*	2015	Asaf Shabtai
5	Sergey Rubinshtein	M.Sc.	*Modeling of multi-stage cyber-attacks*.	2015	
7	Yasmin Bokobza	MSc	*Efficient social network crawling for leakage detection*	2015	Bracha Shapira, Lior Rokach

(c) Research students (current)

	Name	Degree / Expected graduation	Topic	With	Status
2	Abigail Paradise	PhD 2017	*Generating artificial profiles in social networks for detecting reconnaissance phase of APTs*	Asaf Shabtai, Bracha Shapira	The Negev Stipend award, Dean award.
3	Ron Biton	PhD 2018	*Passive Identification of human vulnerabilities*	*Asaf Shabtai*	Proposal submitted Expected graduation: 2018
5	Bronislav Sidik	M.Sc. 2016	*Behavioral analysis of mobile applications*	Lior Rokach	Thesis submitted Expected graduation: 2016
6	Andrey Finkelshtein	MSc 2016	*Extraction of traffic features indicative for attack success*		
8	Jorge Augusto Bendahan	MSc 2017	*Detection of Bad Actors in Social networks*		

8	Hadar Polad	MSc 2017	*Attack Graph Obfuscation*	Bracha Shapira	
9	Tom Gonda	MSc 2017	*Efficient Online Attack Planning*	Bracha Shapira	

(d) Post-doctorate associates

	Name	Topic	Years as PD	With
1	David Toubiana	*Metabolic pathway inference from metabolite correlation networks*	1.5	Yuval Elovici

• **Awards, Citations, Honors, Fellowships**

(a) Honors, Citation Awards

2003, 2004, 2005 – Zlotowski Award for Outstanding Students – Ben-Gurion University

2007 – Best Paper Award – IEEE International Conference on Intelligence and Security Informatics

2008 – Summa Cum Laude, BSc, Software Engineering, Ben-Gurion University,

2008 – Magna Cum Laude, MSc, Information Systems Engineering, Ben-Gurion University,

2010 – Summa Cum Laude, PhD, Information Systems Engineering, Ben-Gurion University

2013 – A manuscript was selected for publication in the ASE Human Journal along with 3% of manuscripts accepted to SocialCom-2013.

2014 – Best Paper Award – The Fourth International Conference on Advanced Collaborative Networks, Systems and Applications (COLLA 2014)

2014 – Best Paper Award – The Seventh Annual Symposium on Combinatorial Search (SoCS 2014)

• **Scientific Publications**

h-index: (ISI– 6; GS – 12)

total citations:

ISI with self-citations	98
ISI without self-citations	77
GS with self-citations	509

Principal Investigator [PI], student [S], post-doctoral fellow [PD], co-researcher [C], technician/laboratory assistant [T].

(c) Refereed chapters in collective volumes, Conference proceedings, Festschrifts, etc.

[1] Meytal Tubi[S], **Rami Puzis**[S], Yuval Elovici[PI], "Deployment of DNIDS in Social Networks", IEEE Intelligence and Security Informatics (ISI), 59-65, (2007), (**best paper award,** Acceptance rate: 30%,)

[2] **Rami Puzis**[S], Marius David Klippel[S], Yuval Elovici[PI], Shlomi Dolev[PI], "Optimization of NIDS placement for protection of intercommunicating critical infrastructures", Springer European Conference on Intelligence and Security Informatics (EuroISI), 191 – 203, (2008)

[3] Erez Shmueli[S], Alexander Kruglov[T], **Rami Puzis**[S], Yuval Elovici[PI], Roman Englert[C], Chanan Glezer[C], "An Attentive Digital Signage System", Digital Signage MIT Interaktiven Displays workshop, Mensch Und Computer (MC), (2009)

[4] Roni Stern[S], **Rami Puzis**[S], Ariel Felner[PI], "Potential Search: A New Greedy Anytime Heuristic Search", AAAI Third Annual Symposium on Combinatorial Search (SOCS), 119-120, (2010)

[5] Emily Rozenshine-Kemelmakher[PD], **Rami Puzis**[S], Ariel Felner[PI], and Yuval Elovici[PI], "Cost benefit deployment of DNIPS" IEEE International Conference on Communications (ICC), 23-27, (2010), (Acceptance rate: 39%)

[6] Michael Fire[S], Lena Tenenboim[S], Ofrit Lesser[S], **Rami Puzis**[C], Lior Rokach[C] and Yuval Elovici[PI], "Link Prediction in Social Networks using Computationally Efficient Topological Features", IEEE Third International Conference on Privacy, Security, Risk and Trust (PASSAT) and IEEE Third International Confernece on Social Computing (SocialCom), (2011).

[7] Yaniv Altshuler[PD], **Rami Puzis**[C], Yuval Elovici[PI], Shlomo Bekhor[PI], and Alex (Sandy) Pentlands[PI], "Augmented Betweenness Centrality for Mobility Prediction in Transportation Networks", Finding Patterns of Human Behaviors in NEtwork and MObility Data (NEMO), (2011)

[8] Ori Ossmy[S], Ofir Tam[S], **Rami Puzis**[PI], Ohad Inbar[PD], Lior Rokach[PI], Yuval Elovici[PI], "MindDesktop: General Human Computer Interface for Severely Handicapped", International Conference on Enterprise Information Systems (ICEIS), (2011).

[9] Roni Stern[S], **Rami Puzis**[PI] and Ariel Felner[PI], "Potential search: a bounded-cost search algorithm", AAAI 21st International Conference on Automated Planning and Scheduling (ICAPS), (2011), (Acceptance rate: 34%)

[10] Talya Porat[PD], Inbal Rief[T], **Rami Puzis**[PI], and Yuval Elovici[PI], "LoOkie - It Feels Like Being There", ACM Human-Computer Interaction Conference (CHI), (2011), (Acceptance rate: 25%)

[11] **Rami Puzis**[PI], Polina Zilberman[S], Yuval Elovici[C], Shlomi Dolev[C], Ulrik Brandes[C], " Heuristics for Speeding up Betweenness Centrality Computation", ASE/IEEE International Conference on Social Computing (SocialCom), Amsterdam, The Netherlands, (Sept. 2012), (Acceptance rate 23%)

[12] Eitan Menahem[S], **Rami Puzis**[PI], Yuval Elovici[PI], "Detecting Spammers via Aggregated Historical Data Set", The 6th International Conference on Network and System Security (NSS), Fujian, China, (Nov 2012)

[13] Shlomi Dolev[PI], Jonathan Goldfeld[S] and **Rami Puzis**[C]. "On-Line detection and prediction of temporal patterns." Hardware and Software: Verification and Testing. Springer Berlin Heidelberg, LNCS Volume 7261, 2012, pp 254-256

[14] * Michael Fire[S], Dima Kagan[T], **Rami Puzis**[PI], Lior Rokach[PI] and Yuval Elovici[PI], "Data Mining Opportunities in Geosocial Networks for Improving Road Safety", In IEEE 27-th Convention of Electrical and Electronics Engineers in Israel (IEEEI), (Nov 2012).

[15] * Zahy Bnaya[S], **Rami Puzis**[PI], Roni Stern[PI], Ariel Felner[PI], Bandit Algorithms for Social Network Queries, ASE/IEEE SocialCom, (2013) (acceptance rate 10%)

[16] * Roni Stern[PI], Liron Smama[S], **Rami Puzis**[PI], Tal Beja[S], Zahy Bnaya[S], and Ariel Felner[PI], "TONIC: Target Oriented Network Intelligence Collection for the Social Web", In AAAI-13, Bellevue, Washington, USA, and in BISFAI 2013 (2013)

[17] * Zahy Bnaya[S], **Rami Puzis**[PI], Roni Stern[PI], and Ariel Felner[PI], "Volatile Multi-Armed Bandits for Guaranteed Targeted Social Crawling", In AAAI-13, Bellevue, Washington, USA, (2013)

[18] *** Rami Puzis**[PI], Yuri Bakulin[S], Yuval Elovici[PI], Chanan Glezer[C], "Targeted marketing in social networks," In Proc. 6th Israeli IE&M Research Conference, Ma'ale-Hahamisha, March 17-18, 2013.

[19] * Yury Puzis[S], Yevgen Borodin[PI], **Rami Puzis**[C], I.V. Ramakrishnan[PI], "Model-Based Browsing Assistant for People with Vision Impairments", In International World-Wide Web Conference (WWW 2013), Rio de Janeiro, Brazil, (2013), (Acceptance rate: 15%)

[20] * Elina Yaakobovich[S], **Rami Puzis**[PI], Lookie - A Case Study of a Location Based Collaborative Application, COLLA 2014 (**best paper award,** Acceptance rate: 30%)

[21] * Liron Samama[S], **Rami Puzis**[PI], Roni Stern[PI] and Ariel Felner[PI], Extended Framework for Target Oriented Network Intelligence Collection, SoCS 2014

[22] * Roni Stern[PI], Scott Kiesel[S], **Rami Puzis**[C], Ariel Felner[C] and Wheeler Ruml[C], Max is More than Min: Solving Maximization Problems with Heuristic Search, SoCS 2014. (**best paper award**), IJCAI 2015.

[23] * Zahy Bnaya[PD], Alon Palombo[S], **Rami Puzis**[C] and Ariel Felner[PI], Confidence Backup Updates for Aggregating MDP State values in Monte-Carlo Tree Search, SoCS 2015

[24] * Abigail Paradise[S], Asaf Shabtai[PI], **Rami Puzis[PI]**, Detecting Organization-Targeted Socialbots through Efficient and Cost-Effective Monitoring of Social Network Profiles, ASONAM, Paris, France, 2015 (acceptance rate: 18%)

[25] * Yasmin Bokobza[S], Abigail Paradise[S], Guy Rapaport[S], **Rami Puzis[PI]**, Bracha Shapira[PI], Asaf Shabtai[PI], Leak Sinks: The Threat of Targeted Social Eavesdropping, ASONAM, Paris, France, 2015 (acceptance rate: 18%)

[26] * Shlomi Dolev[PI], Ariel Hanemann[S], **Rami Puzis[C]**, Brain inspired automatic directory, International Symposium on Stochastic Models in Reliability Engineering, Life Science and Operations Management (SMRLO'16), Beer-Sheva, Israel, 2016

[27] * Sukrit Gupta[S], Konstantin Kilimnik[S], **Rami Puzis[PI]**, Comparative Network Analysis Using Kroneker Graphs, CompleNet, Dijon, France, 2016

[28] * Andrey Finkelshtein[S], **Rami Puzis[PI]**, Asaf Shabtai[PI], Bronislav Sidik[S], Spot the Hotspot: Wi-Fi Hotspot Classification from Internet Traffic, SBP-BRiMS 2016

[29] * Rubinshtein, S., and **Puzis, R.**, Modeling and reconstruction of multi-stage attacks, SwSTE 2016.

(d) Refereed articles and refereed letters in scientific journals, running numbers

[1] **Rami Puzis**[S], Yuval Elovici[PI], Shlomi Dolev[PI], "Fast algorithm for successive computation of group betweenness centrality" Physical Review E, 76 (5): 056709, (2007)
(Citations: 43, IF: 2.288, 5/54, Q1)

[2] **Rami Puzis**[S], Yuval Elovici[PI], Shlomi Dolev[PI], "Finding the most prominent group in complex networks", AI Communications, 20 (4): 287-296, (2007)
(Citations: 45, IF: 0.547, 111/123, Q4)

[3] Shlomi Dolev[PI], Yuval Elovici[PI], **Rami Puzis**[S], Polina Zilberman[S], "Incremental deployment of network monitors based on Group Betweenness Centrality", Information Processing Letters, 109 (20): 1172-1176, (2009)
(Citations: 19, IF: 0.546, 120/139, Q4, alphabetic order)

[4] **Rami Puzis**[S], Dana Yagil[S], Yuval Elovici[PI], Dan Braha[PI], "Collaborative attack on Internet users' anonymity", Internet Research, 19 (1): 60-77, (2009)
(Citations: 17, IF: 1.661, 35/139, Q2)

[5] Shlomi Dolev[PI], Yuval Elovici[PI], **Rami Puzis**[S], "Routing Betweenness Centrality" **Journal of the ACM**, 57 (4): Art. 25, 1-27, (2010)
(Citations: 60, IF: 1.394, 28/102, Q2, alphabetic order)

[6] **Rami Puzis**[S], Meytal Tubi[S], Yuval Elovici[PI], Chanan Glezer[C], and Shlomi Dolev[PI]. 2011. "A Decision Support System for Placement of Intrusion Detection and Prevention Devices in Large-Scale Networks". ACM Trans. Model. Comput. Simul. 22(1), Art. 5 (December 2011), 26 pages.
(Citations: 6, IF: 0.78, 144/257, Q3)

[7] Eyal Cohen[S], Michael Rosenblit[C], **Rami Puzis**[S], Sergey Frenkel[C], Shlomi Dolev[PI], "Nanotechnology Based Optical Solution for NP-Hard Problems", Optical Supercomputing LNCS, Volume 6748, 86-99, Springer, (2011)
(Citations: 1, IF: 0.402, 62/71, Q4)

[8] * **Rami Puzis**[PD], Manish Purohit[S], V.S. Subrahmanian[PI], Betweenness Computation in the Simple Graph Representation of Hypergraphs, Social Networks, 35 (4), 561-572, (2013)
(Citations 2, IF: 0.546, 120/139, Q4)

[9] * Michael Fire[S], Lena Tenenboim-Chekina[S], **Rami Puzis**[C], Ofrit Lesser[S], Lior Rokach[C], Yuval Elovici[PI], "Computationally Efficient Link Prediction in Variety of Social Networks", ACM Transactions on Intelligent Systems and Technology, 5(1), (2013).
(Citations: 10 – 82 citations of the conference paper, IF: 1.252, 56/139, Q2)

[10] * **Rami Puzis**[C], Yaniv Altshuler[PD], Yuval Elovici[PI], Shlomo Bekhor[PI], Yoram Shiftan[PI], Alex Pentland[PI], "Augmented Betweenness Centrality for Environmentally-Aware Traffic Monitoring in Transportation Networks", Journal of Intelligent Transportation Systems, 17(1):91–105, (2013)
(Citations: 21, IF: 1.377, 17/33, Q3)

[11] * Zahy Bnaya[S], **Rami Puzis**[PI], Roni Stern[PI], Ariel Felner[PI], Social Network Search as a Volatile Multi-armed Bandit Problem, ASE Human Journal, 2(2), pp 84-98, (2013) (ISBN: 978-1-

62561-004-1)
(Citations: 4)

[12] * Roni Stern[PI], Ariel Felner[PI], Jur van den Berg[PI], **Rami Puzis**[PI], Rajat, Shah[S], Ken Goldberg[C], Potential-Based Bounded-Cost Search and Non-Parametric Anytime A*, Artificial Intelligence, 214, 1-25, (2014)
(Citations: 6, IF: 3.371, 14/123, Q1)

[13] * Dov Shirtz[S], **Rami Puzis**[C], Yuval Elovici[PI], "A Particle Swarm Model for Estimating Reliability and Scheduling System Maintenance", Enterprise Information Systems, (2014).
(IF: 2.809, 12/116, Q1)

[14] * Abigail Paradise[S], **Rami Puzis**[PI], Asaf Shabtai[PI], Anti-Reconnaissance Tools: Detecting Targeted Socialbots, IEEE Internet Computing , 18(5), 11-19 (2014)
(Citations: 4, IF: 1.713, 16/104, Q1)

[15] **** Rami Puzis**[PI], Polina Zilberman[S], Yuval Elovici[C], Shlomi Dolev[C] and Ulrik Brandes[C], "Topology Manipulations for Speeding Betweenness Centrality Computation", Journal of Complex Networks, 3(1), 84-112, (2015)
(Citations: 3, IF: 2016 evaluation pending)

[16] ** Michael Fire[S], **Rami Puzis**[PI], "Organization Mining Using Online Social Networks", Networks and Spatial Economics, 1-34, DOI 10.1007/s11067-015-9288-4.
(Citations: 20, IF: 2.085, 15/81, Q1)

[17] * Polina Zilberman[PD], **Rami Puzis**[PI], Yuval Elovici[PI] "On network footprint of traffic inspection and filtering at global scrubbing centers", IEEE **Transactions on Dependable and Secured Computing**, to appear, 10.1109/TDSC.2015.2494039.
(IF: 1.351, 51/139, Q2)

[18] * Shlomi Dolev[PI]; Jonathan Goldfeld[S]; **Rami Puzis[C]**, Muni Venkateswarlu[S], Efficient On-line Detection of Temporal Patterns, PeerJ Computer Science, DOI 10.7717/peerj-cs.53.
(IF: 2.112, 13/57, Q1)

(f) Unrefereed professional articles and publications

[1] **Rami Puzis**[S], Meytal Tubi[S], and Yuval Elovici[PI], "Optimizing Targeting of Intrusion Detection Systems in Social Networks", Edt. Borko Furht – Handbook of Social Network Technologies and Applications, Springer, 549-568, (2010)

[2] Michael Fire[S], **Rami Puzis**[C], and Yuval Elovici[PI], "Link prediction in highly fractional data sets", in Handbook of Computational Approaches to Counterterrorism. Edt. V.S. Subrahmanian, Springer, (2012)

[3] Y. Altshuler[PD], **R. Puzis**[C], Y. Elovici[PI], S. Bekhor[PI] and A. Pentland[PI], "Optimizing Surveillance and Monitoring Stations Locations Using Transportation Oriented Augmented Betweenness Centrality" in Securing Transportation Systems, Protecting Critical Infrastructures Series, Springer, Edt. Y. Shiftan and S. Hakim, (2012)

[4] Yaniv Altshuler[PD], **Rami Puzis**[C], Yuval Elovici[PI], Shlomo Bekhor[PI], and Alex (Sandy) Pentland[PI], On the Rationality and Optimality of Transportation Networks Defense — a Network Centrality Approach, in Securing Transportation Systems, Protecting Critical Infrastructures Series Springer, Edt. Y. Shiftan and S. Hakim, (2012)

[5] * Lina Yaakobovich[S], **Rami Puzis**[PI], and Yuval Elovicy[PI], "Incentives in Collaborative Applications ", in Encyclopedia of Social Network Analysis & Mining (ESNAM), Reda Alhajj, Jon Rokne (Eds.), Springer, (2014).

[6] *** Rami Puzis**[PI], Yuval Elovici[PI], Active discovery of hidden profiles in social networks using malware, To appear in Cyber Warfare, Advances in Information Security 56, S. Jajodia et al. (eds.), Springer, (2015).

[7] * Ben Feher[S], Lior Sidi[S], Asaf Shabtai[PI], **Rami Puzis[PI]**, The Security of WebRTC. arXiv preprint arXiv:1601.00184 (2016).

• Lectures and Presentations at Meetings and Invited Seminars

(a) Invited plenary lectures at conferences/meetings

[1] **** Rami Puzis[PI]** "Mastering the social network", International Workshop on the use of Social Networks in Education, Jerusalem, 2014.

[2] **** Rami Puzis[PI]** "Hunting targeted socialbots", 2nd Security Research Seminar, Haifa, 2015.

(e) Presentation of papers at conferences/meetings (oral or poster)

[1] **Rami Puzis**[S], "Optimization of DNIDS Deployment Strategy", SwSTE, Herzlia, Israel, (2007)

[2] **Rami Puzis**[S], Meytal Tubi[S], Gil Tahan[S], Yuval Elovici[PI], "Simulating Threats Propagation within the NSP Infrastructure", IEEE ISI, New Brunswick, NJ, USA (2007) http://ieeexplore.ieee.org/xpls/abs_all.jsp?arnumber=4258740

[3] **Rami Puzis**[S], "Group Betweenness Centrality: Efficient Computations and Applications", CRI-Graph, Haifa, Israel (2008) http://www.cri.haifa.ac.il/events/2008/0504_graph/cri-puzis.pdf

[4] **Rami Puzis**[S], Shlomi Dolev[PI], Yuval Elovici[PI], "Expressing Centrality in terms of Routing Betweenness", NetSci, Boston, MA, USA (2010)

[5] **Rami Puzis**[PI], Yuri Bakulin[S], Yuval Elovici[PI], "Diffusion Focus in Social Networks", NetSci, Evanston, IL, USA (2012)

[6] **Rami Puzis**[C], Yaniv Altshuler[PD], Yuval Elovici[PI], Shlomo Bekhor[PI], Yoram Shiftan[PI], and Alex (Sandy) Pentland[PI], "Traffic Assignment Model Based on Betweenness", NetSci, Evanston, IL, USA (2012)

[7] **** Rami Puzis**[PI], MindDesktop: Computer Accessibility for Severely Handicapped, UBIQUITOUS USER MODELING, Ben-Gurion, Beer-Sheva, Israel (2013)

[8] **** Rami Puzis**[PI], Luiza Nahshon[S], Poster: NetFlow for OpenFlow Integrating legacy Flow-based NIDS with OpenFlow networks, NDSS 2014

[9] ** Baker Masarwi[S], Yossi Ben Shlomo[S], **Rami Puzis**[PI], Oded Green[C], Faster Clustering Coefficient Algorithm Using BFS Horizontal Edges, NetSci, Berkeley, CA, US, 2014.

[10] ** Yedidya Bar-Zev[S], Arik Vartanian[S] and **Rami Puzis**[PI], Graph Classification using Information-Gain Feature Ranking, NetSci, Berkeley, CA, US, 2014.

[11] * Alon Palombo[S], Roni Stern[PI] and **Rami Puzis**[C], Solving the Snake in the Box Problem with Heuristic Search:First Results, BISFAI-15, Bar-Illan, Israel, 2015

[12] * Yasmin Bokobza[S], Abigail Paradise[S], Guy Rapaport[S], **Rami Puzis**[PI], Bracha Shapira[PI], Information Leakage Detection in Social Networks Using an Artificial Profile, NetSci, Zaragoza, Spain, 2015

[13] ** Miriam Hoderker[S], Konstantin Kilimnik[S], **Rami Puzis**[PI], Category Extraction Through Community Detection in Wikipedia, NetSci, Zaragoza, Spain, 2015

[14] ** Bronislav Sidik[S], Yisrael Mirsky[S], Luiza Nachson[S] and **Rami Puzis**[PI], Temporal Anomaly Detection in Dynamic Graphs, NetSci, Zaragoza, Spain, 2015

(f) Presentations at informal international seminars and workshops

[1] **Rami Puzis**, "Simulating electronic threat propagation in computer networks", Technical University of Berlin, Germany, (2007)

[2] **Rami Puzis**, "Group betweenness centrality as a heuristic for locating network filters", University of Konstanz, Germany, (2010)

[3] ** Guy Rapaport[S], Dima Kagan[S], Michael Fire[C], Keren Fruchter[T], **Rami Puzis**[PI], "Unfolding Discussions in Social Media", DMBI 2014.

- **Patents**

[1] Inventors: Rami Puzis, Shlomi Dolev, Yuval Elovici
Title: Process for Finding the Most Prominent Group of Vertices in Complex Data Communication Networks
Application number: EP 07015351.5
Publication number: EP 1887744A2
Filing date: EPO 06/08/07

[2] Inventors: Eitan Menahem, Rami Puzis
Title: Historical Dataset for SPAM Mitigation Using Machine Learning
Application number: EPO 13 002 438.3 -1862
Filing date: EPO 06/08/2007

[3] Inventors: Rami Puzis, Shlomi Dolev, Yuval Elovici
Title: Optimal Deployment of Infection Detection Systems over a Data Network
Application number: EP 07015351.5
Publication number: EP 1887744
Filing date: EPO 06/10/07

[4] Inventors: Meytal Tubi, Rami Puzis, Yuval Elovici
Title: Optimal Deployment of Infection Detection Systems over a Social Network
Application number: EPO 08002999.4
Publication number: EPO 1990973A2
Filing date: EPO 19/02/08

[5] Inventors: Yuval Elovici, Roman Englert, Alexander Kruglov, Erez Shmueli
Title: A comprehensive computer implemented system and method for adapting the content of digital signage displays
Application number: EP20090007412
Publication number: EP2136329 A3
Filing date: EPO 5/6/08

[6] Inventors: Ariel Felner, Rami Puzis, Olga Brukman, Polina Zilberman, Yuval Elovici, Michael Gorelik
Title: Disjoint Ranges Search Tree
Application number: IPO 208996
Filing date: IPO 28/10/10

[7] Inventors: Ori Ossmy, Ofir Tam, Ariel Rozen, Rami Puzis, Yuval Elovici
Title: MindDesktop – An Apparatus for Operating a Computer Using Thoughts or Facial Impressions
Application number: IPO 208796
Filing date: IPO 18/10/10

[8] Inventors: Danny Hendler, Rami Puzis
Title: A method for generating a randomized data structure for Representing sets, based on bloom filters
Application number: EPO 12000641.6
Filing date: IPO 10/02/2011

[9] Inventors: Michael Fire, Rami Puzis, Yuval Elovici
Title: System and Method for Determining by an External Entity the Human Hierarchical Structure of an Organization, Using Public Social Networks
Application number: IPO 223544; WIPO PCT/IL2013/051011
Filing date: IPO 10/12/12; WIPO 09/12/13

[10] Inventors: Rami Puzis, Roni Stern, Lior Rokach, Yuval Elovici, Tal Beja, Ariel Felner, Zahy Bnaya, Liron Samama
Title: System and Method for Identifying Contacts of a Target User in a Social Network
Application number: USPO 14/065,505
Filing date: USPO 29/10/2013

[11] Inventors: Rami Puzis, Asaf Shabtai, Yuval Elovici
Title: Social Network Honeypot
Application number: IPO 232528
Filing date: IPO 08/05/14

[12] Inventors: Rami Puzis, Guy Rapaport
Title: A Method for Tracking Discussion in Social Media
Application number: IPO 236511
Filing date: IPO 29/12/14

[13] Inventors: Rami Puzis, Luiza Nahshon
Title: A System and a Method for Integrating Legacy Flow-Monitoring Systems with SDN Networks
Application number: WIPO PCT/IL2015/050170
Publication number: WIPO 2015/121864 A1
Filing date: WIPO 15/02/15

[14] Inventors: Yuval Elovici, Asaf Shabtai, Rami Puzis, Christoph Pylo
Title: A Router Based Honeypot For Detecting Advanced Persistent Threats

[15] Inventors: Asaf Shabtai, Rami Puzis, Lior Rokach
Title: A method and system for automatic, non-disruptive, inference of the security awareness level of users by analyzing host and network traffic observations

[16] Inventors: Noam Gross, Asaf Shabtai, Rami Puzis
Title: Personal, secured network for mobile and wearable IoT devices

[17] Inventors: Polina Zilberman, Rami Puzis, Rami Puzis
Title: Identifying Boosting Capabilities of Users in Social Media using Temporal Analysis

[18] Inventors: Asaf Shabtai, Rami Puzis, Shimon Silberschlag, Mehran Roshandel
Title: A System for Detecting Malicious Re-Programming of a PLC in SCADA Systems Using One-Way Baseline Engineering Workstation

[19] Inventors: Asaf Shabtai, Rami Puzis, Shimon Silberschlag, Mehran Roshandel
Title: A System for Detecting Malicious Re-Programming of a PLC in SCADA Systems Using Programming Time Windows

[20] Inventors: Asaf Shabtai, Rami Puzis, Shimon Silberschlag, Mehran Roshandel
Title: A System for Detecting a Malicious PLC in SCADA Systems That is Sending False Telemetry Data

• **Research Grants**
Total grants as a faculty member: $4.8M, my share $1.9M
Total grants since 2015: $1.1M, my share $534K

[1] 7/2007-6/2008
Role: Project Manager (PI: Prof. Yuval Elovici, Prof. Shlomi Dolev,)
Research Topic: "**eDare(II&III) – Early Detection Alert and Response to eThreats**"
Funding Agency: Deutsche Telecom AG.
Total Grant: $187K.

[2] 5/2009-1/2010
Role: Project Manager (PI: Prof. Yuval Elovici, Dr. Danny Hendler, Dr. Ariel Felner)
Research Topic: "**Spam Mitigation in IPv6**"
Funding Agency: Deutsche Telecom AG.
Total Grant: $450K, my share 25%.

[3] 3/2010-3/2011
Role: Project Manager (PI: Prof. Yuval Elovici)
Research Topic: "**MobileEyes**"
Funding Agency: Deutsche Telecom AG.
Total Grant: $600K, my share 50%.

[4] 9/2010-9/2011
Role: Project Manager (PI: Prof. Yuval Elovici)
Research Topic: "**Detecting Hidden Links and Nodes in Public Social Networks**"
Funding Agency: Israeli Ministry of Defense.
Total Grant: $77K, my share 50%.

[5] 03/2011-03/2012
Role: Project Manager (Other PI: Prof. Boaz Rafaeli)
Research Topic: "**Pinnaculars – visual to auditory sensory substitution**"
Funding Agency: Deutsche Telecom AG.
Total Grant: $30K, my share 50%.

[6] 10/2011-04/2013
Role: Principle Investigator (Other PI, Dr. Lior Rokach, Prof. Bracha Shapira, Prof. Yuval Elovici)
Research Topic: **Evaluation Environment for Simulating Cyber Attacks**.
Funding Agency: Israeli Ministry of Defense
Total Requested Grant: $95K, my share 25%.
Running total as faculty member: $95K, my share $47.5K

[7] 1/2012-1/2013
Role: Principle Investigator (Research Manager Prof. Yuval Elovici, Other PI, Dr. Lior Rokach)
Research Topic: **Optimal Network Monitoring for detecting APT while taking into account acquisition cost.**
Funding Agency: Ministry of Trade and Commerce
Total Requested Grant: $86K, my share 33%.

[8] 1/2012-1/2013
Role: Principle Investigator (Research Manager Prof. Yuval Elovici, Other PI, Dr. Lior Rokach, Dr. Ariel Felner)
Research Topic: **Reconstruction of Hidden or non-existent Identities Through Automatic Social Network Crawling.**
Funding Agency: Ministry of Trade and Commerce
Total Requested Grant: $148K, my share 25%.

[9] 9/2012-8/2013
Role: Research Manager (Other PI, Prof. Yuval Elovici)
Research Topic: **Social Network Crawling for Targeted Group and Organization Data Collection.**
Funding Agency: Israeli Ministry of Defense
Total Requested Grant: $63K, my share 50%.

[10] 1/2013-1/2014
Role: Principle Investigator (Research Manager Prof. Yuval Elovici)
Research Topic: **Optimal Network Monitoring for detecting APT while taking into account acquisition cost.**
Funding Agency: Ministry of Trade and Commerce
Total Requested Grant: $86K, my share 50%.

[11] 1/2013-1/2014
Role: Principle Investigator (Research Manager Prof. Yuval Elovici, Other PI, Dr. Lior Rokach, Dr. Ariel Felner)
Research Topic: **Reconstruction of Hidden or non-existent Identities Through Automatic Social Network Crawling.**
Funding Agency: Ministry of Trade and Commerce
Total Requested Grant: $148K, my share 25%.

[12] 4/2013-10/2014
Role: Principle Investigator (Other PIs, Prof. Lior Rokach, Prof. Bracha Shapira, Prof. Yuval Elovici)
Research Topic: **Acceleration of cyber-attacks over time**.
Funding Agency: Elbit LTD
Total Requested Grant: $556K, my share 25%.

[13] 11/2012-10/2013
Role: Principle Investigator (Other PIs, Prof. Yuval Elovici, Prof. Lior Rokach, Prof. Bracha Shapira)
Research Topic: **Infrastructure for Cyber C&C**
Funding Agency: Israeli Ministry of Defense
Total Requested Grant: $71K, my share 25%

[14] 11/2012-10/2013
Role: Principle Investigator (Other PIs, Prof. Yuval Elovici, Prof. Lior Rokach, Prof. Bracha Shapira)
Research Topic: **Simulation Evaluation Environment**
Funding Agency: Israeli Ministry of Defense
Total Requested Grant: $71K, my share 25%

[15] 4/2013-4/2014
Role: Principle Investigator (Other PIs, Prof. Yuval Elovici, Dr. Asaf Shabtai)
Research Topic: **Detecting Advanced Persisted Threats Using Innovative Honeypots**
Funding Agency: Deutsche Telekom AG
Total Requested Grant: $700K, my share 33%

[16] 10/2013-1/2014
Role: Principle Investigator (Other PIs, Prof. Yuval Elovici)
Research Topic: **Diffusion Tracking in Social Media for TD CRM**
Funding Agency: Deutsche Telekom AG
Total Requested Grant: $56K, my share 50%

[17] 1/2014-1/2015
Role: Research Manager (Other PI, Prof. Yuval Elovici, Prof. Ariel Felner)
Research Topic: **Realtime diffusion tracking in social networks.**
Funding Agency: Israeli Ministry of Defense
Total Requested Grant: $55K, my share 33%.

[18] 1/2014-1/2015
Role: Principle Investigator (Research Manager Prof. Yuval Elovici)
Research Topic: **Optimal Network Monitoring for detecting APT while taking into account acquisition cost.**
Funding Agency: Ministry of Trade and Commerce
Total Requested Grant: $185K, my share 50%.

[19] 1/2014-1/2015
Role: Principle Investigator (Other PIs: Ariel Felner, Roni Stern)
Research Topic: **Target Oriented Network Intelligence Collection for the Social Web Funding Agency: Ministry of Science Technology and Space (MOST)**
Total Requested Grant: $20K, my share 33%.

[20] 1/2014-1/2016
Role: Principle Investigator (Research Manager Dr. Asaf Shabtai, Other PI: Prof. Lior Rokach)
Research Topic: **Identifying the level of security awareness of Internet users via passive and active network monitoring.**
Funding Agency: Ministry of Trade and Commerce
Total Requested Grant: $157K, my share 33%.

[21] 4/2014-4/2015
Role: Research Manager (other PI: Prof. Yuval Elovici, Prof. Lior Rokach, Prof. Bracha Shapira)
Research Topic: **Distributed Programmable Low Cost Sensors**
Funding Agency: EMC and Lockheed Martin
Total Requested Grant: $600K**,** my share 25%

[22] 6/2014-12/2014
Role: Research Manager (other PI: Prof. Yuval Elovici, Dr. Asaf Shabtai)
Research Topic: **Social Network Honeypot – Field Trial**
Funding Agency: Deutsche Telekom AG
Total Requested Grant: $48K**,** my share 33%

[23] 9/2014-11/2015
Role: Research Manager (Other PI, Prof. Yuval Elovici)
Research Topic: **Social & Media Big Data Analytics @ CRM**
Funding Agency: Deutsche Telekom AG
Total Requested Grant: $205K, my share 50%.

[24] 12/2014-12/2015
Role: Research Manager (Other PI, Prof. Yuval Elovici)
Research Topic: **Security sentiment analysis from mobile application feedbacks.**
Funding Agency: Israeli Ministry of Defense
Total Requested Grant: $180K, my share 50%.

[25] 1/2015-4/2015
Role: Research Manager (Other PI, Prof. Yuval Elovici)
Research Topic: **Middle Me.**
Funding Agency: Deutsche Telekom AG
Total Requested Grant: $115K, my share 50%.

[26] 1/2015-4/2015
Role: Research Manager (Other PI, Dr. Asaf Shabtai)
Research Topic: **WiFi Reputation Aider.**
Funding Agency: Deutsche Telekom AG
Total Requested Grant: $116K, my share 50%.

[27] 3/2015-9/2015
Role: Research Manager
Research Topic: **SDN In Real Time Manufacturing.**
Funding Agency: Deutsche Telekom AG
Total Requested Grant: $60K, my share 100%.

[28] 5/2015-4/2016
Role: Research Manager (Other PI, Dr. Asaf Shabtai)
Research Topic: **WiFi Reputation Aider – Second Phase.**
Funding Agency: Deutsche Telekom AG
Total Requested Grant: $500K, my share 50%.

[29] 7/2015-7/2016
Role: Primary Investigator (Other PI, Prof. Yuval Elovici, Dr. Asaf Shabtai)
Research Topic: **Dynamic proxy-based monitoring system for SCADA.**
Funding Agency: Deutsche Telekom AG
Total Requested Grant: $234K, my share 33%.

[30] 10/2015-5/2016
Role: Primary Investigator (Research Manager Dr. Asaf Shabtai, Other PI, Prof. Yuval Elovici)
Research Topic: **Securing Web RTC Platform in FALCON.**
Funding Agency: Deutsche Telekom AG
Total Requested Grant: $272K, my share 33%.

[31] 11/2015-11/2017

Role: Research Manager
Research Topic: **Scalable attack path finding and attack graph visualization for increased security.**
Funding Agency: Cyber Security Research Center
Total Requested Grant: $103K, my share 100%.

[32] 11/2015-11/2016

Role: Research Manager (Other PI, Prof. Yuval Elovici, Dr. Asaf Shabtai)
Research Topic: **Fake CV generation for professional social networks**
Funding Agency: Israeli Ministry of Defense
Total Requested Grant: $43K, my share 33%.

• **Present Academic Activities**

(1) Submitted

[1] Mordechai Guri, Rami Puzis, Gabi Kedma; Sergei Rubinshtein; Yuval Elovici, Limiting Spread of Unintentionally Leaked Sensitive Documents over The Internet and Through Social Networks submitted to TDSC SI
[2] Abigail Paradise, Asaf Shabtai, Rami Puzis, Aviad Elyashar, Yuval Elovici, Creation and Management of Social Network Honeypots for Detecting Targeted Cyber Attacks submitted to IEEE TCSS
[3] David Livshits, Daniel Gordon, Asaf Shabtai, Rami Puzis, Stefan Pham, Alexandra Mikityuk, On the Vulnerabilities and Privacy Issues of EME - Native DRM Extensions in HTML5, submitted to IEEE MultiMedia
[4] Shlomi Maliah, Guy Shani, Rami Puzis, Shortest Path Tree Sampling for Landmark Selection in Large Networks submitted to Journal of Complex Networks

(2) In preparation:

[1] Shani, Guy; Puzis, Rami; Maymon, Meirav; Stein, Adi; Yotam, Yair, EEG-based Dynamic Difficulty Adjustment for Multiplayer Games
[2] Shaked Zimmermann, Asaf Shabtai, Rami Puzis, Michael Arov, Yuval Elovici SoK: Network Devices - Target for Cyber Attacks.
[3] Rami Puzis, Luiza Nahshon, Polina Zilberman, Seamless Integration of Legacy Flow-based NIDS to OpenFlow Networks with Balanced Flow Monitoring.
[4] Luiza Nahshon, Guy Rapaport, Rami Puzis, Yuval Elovici, Chanan Glezer, Key-Posts in social media and citation networks
[5] Bronislav Sidik, Polina Zilberman, Rami Puzis, Yuval Elovici, Leader Election in Practice 2016
[6] Finkelstein, Andrey; Nassi, Ben; Brodt, Oleg; Puzis, Rami; Shabtai, Asaf, "Detecting Malicious Reprogramming of PLCs in SCADA Networks"
[7] Rami Puzis, Barak Hagbi, Maor Hornstein, Roni Stern, Ariel Felner and Lior Rokach, Leveraging Past Crawls to Improve Targeted Crawling

(3) Research in progress

[1] Bronislav Sidik, Rami Puzis, Lior Rokach, Yuval Elovici, Comparative Behavioral Analysis of Android Applications, 2015
[2] Scalable TM Estimation using Betweenness Centrality, with Polina Zilberman, 2015
[3] Network Device Honeypots, with Shaked Zimmermann, Asaf Shabtai, Yuval Elovici, 2015
[4] Security awareness estimation from network traffic data, with Asaf Shabtai, Ron Biton, Andrei Finkelshtein 2016
[5] Algorithms and Applications of Centrality Measures, V.S. Subrahmanian, Yuval Elovici, 2016
[6] Mitigating Signaling DDoS Attacks Launched via Mobile Applications, with Yuval Elovici, V.S. Subrahmanian, Edoardo Serra, Noseong Park 2016
[7] Francesca Spezzano, Srijan Kumar, VS Subrahmanian, Betweenness Centrality in Signed Networks, 2016
[8] Complex networks classification, with Sukrit Gupta, Giovanni Felici, Daniele Santoni
[9] Improving community detection with link prediction methods, Ashwin Bahulkar, Boleslaw Szymanski
[10] All optical passive scrambler for untrusted ubiquitous Internet connected devices, with Yossi Oren, Michael Rosenblit

• **Synopsis of research, including reference to publications and grants in above lists**

My main research interests lie in complex networks analysis, an area of study that involves a variety of domains ranging from the analysis and investigation of social networks to computer security. In this latter field, computer security, my focus has been on the analysis of computer communication networks to protect end-users and critical infrastructure facilities from malicious attacks and incidents. Investigating the Internet structure reveals the vulnerability of users to attacks on the privacy of their communications.

In the scope of a running research project supported by IDF the spread of media content in social networks will be studied to unravel hidden users and social ties (e.g. hidden due to privacy considerations). As a part of this research we also focused on epidemic propagation models in social networks. We have identified groups of users that are in the best position to halt the spread of epidemic. In this project we will focus on the problem of pinpointing the most influential groups users that are in the best position to facilitate spreading.

Pinpointing of the most significant nodes in social or computer networks requires developing efficient algorithms in two domains: First domain includes optimization algorithms for finding the group of key players. Branch and bound heuristic search algorithms were found to be very efficient optimization algorithm for finding the group of nodes with maximal GBC. Further enhancement of the search methods will make it possible to find a solution that is better than a given constant with minimal search efforts.

The second domain includes efficient computation of centrality indices. One of the most challenging tasks in complex network analysis is scaling this computation. A new efficient algorithm was presented for computing group betweenness centrality (GBC). After a pre-computation step, the time required to compute centrality of every given group does not depend on the network's size. Thus, the algorithm can be used for finding the most central groups even in large-scale networks. Following the work on speed up the computation of betweenness centrality which was carried out in collaboration with Prof. Ulrik Brandes from the University

of Konstanz, I am working on efficient representation of Attack Graphs. Future steps in this research direction will include implementing fast algorithms for betweenness and group betweenness computation using a general purpose graphical processing unit (GPGPU) to exploit high level parallelization in the computing process.

Besides increasing the efficiency of centrality computation algorithms, it is very important to device centrality measures that are suitable for a variety of real world applications. Proposed Routing Betweenness Centrality, a generalization of shortest path betweenness, can be used with an arbitrary (loop free) routing strategy.