

# BGU Data Science Center Application Form

## A. Data Science Center Members' List

### A.1 10 Active Faculty Members in Core Data Science Fields

Title, name, department, short description of main research interest(s).

No	Title	First and last name	Department	Main Research Interest(s)
1	Prof.	Chen Avin	Communication Systems Engineering	Social Network Analysis
2	Prof.	Aryeh Kontorovich	Computer Science	Machine Learning
3	Prof.	Michael Elhadad	Computer Science	Natural Language Processing
4	Prof.	Ohad Ben-Shahar	Computer Science	Computer Vision
5	Dr.	Sivan Sabato	Computer Science	Machine Learning
6	Prof.	Boaz Lerner	Industrial Engineering and Management	Machine Learning, Deep Learning
7	Dr.	Jonathan Rosenblatt	Industrial Engineering and Management	Statistical Learning Theory
8	Prof.	Bracha Shapira	Software and Information Systems Engineering	Text Analytics, Recommender Systems
9	Prof.	Lior Rokach	Software and Information Systems Engineering	Machine Learning, Deep Learning
10	Prof.	Mark Last	Software and Information Systems Engineering	Time-Series Analysis, Natural Language Processing

### A.2 10 Active Faculty Members in Data Science Related Fields

No	Title	First and last name	Department	Main Research Interest (s)
1	Dr.	Tal Shay	Biology	Bioinformatics and computational biology
2	Prof.	Danny Hendler	Computer Science	Cyber security
3	Dr.	Eitan Rubin	Health Sciences	Precision medicine
4	Prof.	Esti Yeger-Lotem	Health Sciences	Bioinformatics
5	Prof.	Jacob Moran-Gilad	Health Sciences	Epidemiology
6	Prof.	Ariel Felner	Software and Information Systems Engineering	AI
7	Prof.	Yuval Elovici	Software and Information Systems Engineering	Cyber security
8	Dr.	Robert Moskovitch	Software and Information Systems Engineering	Biomedical Informatics, Cyber Security
9	Prof.	Yuval Shahar	Software and Information Systems Engineering	Biomedical Informatics, Cyber Security
10	Dr.	Zvi Perry	Health Sciences and Soroka Hospital	Epidemiology

## **B. Description of suggested actions for achieving the objectives listed in the Call for Proposals (including estimation of costs).**

Please note that at least 50% of the budget is to be allocated to achieving objectives no. 2-4, as indicated in the Call for Proposals

### **B.1 Mission Statement**

The Data Science Research Center at Ben-Gurion University of the Negev (DSRC@BGU), founded in April 2018, brings together one of the largest multidisciplinary groups of data scientists in Israel. The current list of the Center members, shown in the Appendix, includes 98 faculty members from 20 different departments of all BGU faculties (Engineering, Natural Sciences, Humanities and Social Sciences, Health Sciences, and the Institute of Desert Studies).

The center will focus on encouraging theoretical and practical research in data mining, machine learning, and big data. BGU researchers have already gained a substantial expertise in applying data science methods and tools to a variety of such rapidly growing fields as artificial intelligence, computer vision, cyber security, social network analysis, computational biology, bioinformatics, precision medicine, digital health, and natural language processing. Based on our present achievements in data science and related areas, we believe that BGU has a significant potential to contribute to the well-being of Israeli citizens and the world community by becoming an internationally renowned leader in data science research.

Our mission is:

- To advance the state-of-the-art in data science through basic research in core data science areas;
- To transform multiple fields of science and engineering (ranging from cyber security to digital health) through continuous collaboration between data scientists and domain experts;
- To educate new generations of data-aware professionals through enhancing programs of study at undergraduate and graduate levels across the entire university.

### **B.2 List of proposed actions<sup>1</sup>**

#### **B.2.1 Hiring new faculty members**

**Description:** Assisting various departments in finding new high-quality faculty members who are working in the core and the related areas of data science.

**Explanation:** This action is designed to achieve objective no. 1 (extending and deepening high-quality research in the core areas of data science). The search for new and talented faculty candidates from around the world will be conducted via personal contacts of the Center members, data science portals and newsletters, online professional communities, and face-to-face meetings at major data science conferences.

**Volume of activity in the first two years:** Identifying at least eight qualified candidates in the core and related areas of data science.

**Estimated cost to the Center in the first two years:** none.

**Performance/success indicator(s):** At least six hired faculty members in the core and related areas of data science, at least three of them at the rank of Senior Lecturer and higher.

---

<sup>1</sup> All estimated costs include BGU matching funds

### **B.2.2 Maintenance of research labs**

**Description:** Partially supporting maintenance of research labs focusing on specific core or related areas of data science.

**Explanation:** This action is designed to achieve objectives no. 2 and 3 (supporting collaboration between scientists of the core areas in data science and expanding the capabilities of data scientists for new interdisciplinary collaborations). There will be an internally reviewed call for lab funding proposals in core and related areas of data science targeted at teams of data science researchers from at least two different areas.

**Volume of activity in the first two years:** awarding three lab funding grants each year.

**Estimated cost to the Center in the first two years:** 3 grants per year \* 2 years \* 20k per grant = 120k.

**Performance/success indicator(s):** six grants awarded in the first two years, maintenance of at least four labs completed.

### **B.2.3 Collaboration in the core areas of data science**

**Description:** Partially supporting research projects involving researchers from at least two different core areas of data science.

**Explanation:** This action is designed to achieve objective no. 2 (supporting collaboration between scientists of the core areas in data science). There will be an internally reviewed call for research proposals involving researchers from at least two different core areas of data science inside and outside BGU. The yearly amount of funding allocated for each grant will be 100k in scholarships + 10k in equipment acquisition. The proposals will be selected for funding by a reviewing board based on their scientific merit, problem significance, originality of ideas, research novelty, previous research experience of principal investigators, and other criteria. The calls will be open to all Center members. Funding extension for the second year will be conditioned upon the submission of a proposal by the involved researchers to an external competitive grant by the end of the first year.

**Volume of activity in the first two years:** Awarding 13 one-year grants in the first two years (six and seven grants in the first and the second year, respectively).

**Estimated cost to the Center in the first two years:** 110k per grant \* 13 grants = 1,430k (1,400k in scholarships + 30k in equipment acquisition)

**Performance/success indicator(s):** 13 yearly grants awarded in the first two years, at least 10 of them resulted in submitting an external competitive grant and papers submitted to major conferences / journals. At least three competitive grants awarded and at least six papers accepted to major conferences / journals.

### **B.2.4 Data scientists networking**

**Description:** Exposing the Center members to each other's work.

**Explanation:** This action is designed to achieve objectives no. 2 and 3 (encouraging collaboration between scientists of the core areas in data science and expanding the capabilities of data scientists for new interdisciplinary collaborations). The networking activities will include weekly data science seminars, one-day workshops focused on specific topics, data science retreats for faculty members and graduate students (at least one per semester), and an international data science conference (at least one per year). The Center website (<http://in.bgu.ac.il/en/data-science>) will publish up-to-date information about the upcoming events, funding opportunities, available databases, data science conferences and journal calls for papers, as well as data-science challenges.

**Volume of activity in the first two years:** 50 weekly seminars, four retreats, and two data science conferences.

**Estimated cost to the Center in the first two years:** Total event costs of 50k per year \* two years = 100k. Website maintenance costs of 20k per year \* two years = 40k.

**Performance/success indicator(s):** At least 40 weekly seminars, three retreats, and two data science conferences. At least 50% participation of the Center members in the retreats and at least 100 participants in each conference.

### **B.2.5 Interdisciplinary collaboration in data science.**

**Description:** Partially supporting interdisciplinary research projects involving researchers from at least one related area of data science.

**Explanation:** This action is designed to achieve objective no. 3 (expanding the capabilities of data scientists for new interdisciplinary collaborations). There will be an internally reviewed call for research proposals involving researchers from at least one related area of data science inside and outside BGU. The yearly amount of funding allocated for each grant will be 100k in scholarships + 10k in equipment acquisition. The proposals will be selected for funding by a reviewing board based on their scientific merit, relevance to data science, problem significance, research novelty, potential impact, previous research experience of principal investigators, and other criteria. The calls will be open to all Center members. Funding extension for the second year will be conditioned upon the submission of a proposal by the involved researchers to an external competitive grant by the end of the first year.

**Volume of activity in the first two years:** Awarding 13 one-year grants in the first two years (six and seven grants in the first and the second year, respectively).

**Estimated cost to the Center in the first two years:** 110k per grant \* 13 grants = 1,430k (1,400k in scholarships + 30k in equipment acquisition)

**Performance/success indicator(s):** 13 yearly grants awarded in the first two years, at least 10 of them resulted in submitting an external competitive grant and papers submitted to major conferences / journals. At least three competitive grants awarded and at least six papers accepted to major conferences / journals.

### **B.2.6 Collaboration with government and industry**

**Description:** Encouraging and partially supporting collaboration activities with government and industry.

**Explanation:** This action is designed to achieve objective no. 4 (encouraging and supporting collaboration with public institutions and organizations as well as private companies). There will be joint conferences and seminars with government and industry representatives aimed at discussing research topics and cooperation of mutual interest. Industry will be also invited to take active roles in teaching practical workshops and courses related to data science. The Center will be encouraging the signing of cooperation agreements with government, public, and private institutions and companies, such as IDF and other security entities, Police, public Hospitals, and relevant industries. All in collaboration with BGN Technologies (Technology Transfer Company of BGU). Selected joint projects with public institutions will be supported by matching funds.

**Volume of activity in the first two years:** Organizing four joint events with government and industry, signing 2-4 cooperation agreements, awarding four matching grants.

**Estimated cost to the Center in the first two years:** Four joint events \* 2k per event = 8k. Four matching grants \* 50k per grant = 200k.

**Performance/success indicator(s):** At least two cooperation agreements signed, four matching grants awarded.

### **B.2.7 Computational infrastructure.**

**Description:** Providing state-of-the-art computational infrastructure to the Center members.

**Explanation:** This action is designed to achieve objective no. 5 (technical support). It will involve acquisition and maintenance of collective computational infrastructure for Center members (high-computational servers, cloud services, etc.). There will also be partial funding of the tech support staff knowledgeable in data science platforms and technologies.

**Volume of activity in the first two years:** A cluster of high-computational servers will be purchased in the first year and extended in the second year. In addition, a cloud computing credit will be purchased each year from cloud services (such as AWS). A part-time software engineer knowledgeable in data science platforms and technologies will be hired by the Center to provide tech support for the infrastructure users.

**Estimated cost to the Center in the first two years:** Servers and cloud computing services: 378k (first year) + 158k (second year) = 536k. A part-time software engineer: 100k per year \* 2 years = 200k.

**Performance/success indicator(s):** Infrastructure used by at least 25% of the Center members.

### **B.2.8 New courses development**

**Description:** Partially supporting development of new interdisciplinary data science courses aimed at students from multiple departments and faculties.

**Explanation:** This action is designed to achieve objective no. 6 (teaching support). Two introductory courses in data science will be developed. The first one will be aimed at faculty and graduate students with engineering and relevant computer science background but with no background or experience in data science. The second one will be aimed at faculty and graduate students lacking an engineering background. The courses will be selected by an internal selection committee under a call for teaching support proposals in data science. All course lectures will be recorded and published online.

**Volume of activity in the first two years:** Two courses will be developed (one each year).

**Estimated cost to the Center in the first two years:** 100k per course \* two courses = 200k.

**Performance/success indicator(s):** Development of two courses completed. At least one course taught once with a minimal enrolment of 20 students.

### **B.2.9 Data accessibility**

**Description:** Funding domain-specific databases.

**Explanation:** This action is designed to achieve objective no. 7 (data accessibility). It will involve BGU part in the cost of access to domain-specific databases, which will be supported by the IDSI (Israel Data Science Initiative) and made available to all approved Data Science Centers. An example of such database: LDC – Linguistic Data Consortium <https://catalog ldc.upenn.edu/>.

**Volume of activity in the first two years:** Access to three databases will be supported each year.

**Estimated cost to the Center in the first two years:** 10k per database \* three databases per year \* two years = 60k.

**Performance/success indicator(s):** At least three submitted / accepted papers using each database.

## B.2.10 Public outreach

**Description:** Organizing events for the general public.

**Explanation:** This action is designed to achieve objective no. 4 (encouraging and supporting collaboration with public institutions and organizations as well as private companies). There will be popular lectures in data science aimed at the public (including high school students) as well as data hackathons with challenges and data that will be interesting to the research community and of value to the society. The invited participants will include students in relevant fields and data scientists from outside the university. Professional mentoring will be provided throughout the event.

**Volume of activity in the first two years:** Two data hackathons will be organized each year.

**Estimated cost to the Center in the first two years:** 10k per hackathon \* two hackathons per year \* two years = 40k.

**Performance/success indicator(s):** Four hackathons organized, at least 80 participants in each hackathon.

## C. The Center's Management & Supervision Team

C.1 Please provide details of other centers at your university related to data science, as well as a plan for how the proposed new center will support and coordinate data science research and activities throughout the university.

The Center will support and coordinate data science research and activities throughout the university by sharing data, organizing joint events, and issuing joint calls for proposals with the following centers related to data science:

- The BGU Cyber Security Research Center <http://cyber.bgu.ac.il/>
- Zlotowski Center for Neuroscience <http://in.bgu.ac.il/en/zlotowski/Pages/default.aspx>
- The Center for Evolutionary Genomics and Medicine <http://in.bgu.ac.il/en/egm/Pages/default.aspx>
- The Lynne and William Frankel Center for Computer Science <https://www.cs.bgu.ac.il/~frankel/>

C.2 Please attach an organizational diagram of the center's management and supervision team using the table below

Name	Current position	Managerial position in the center	% position	other
Prof. Mark Last	SISE	Director		
Prof. Bracha Shapira	SISE	Steering Committee Member		
Prof. Aryeh Kontorovich	CS	Steering Committee Member		
Prof. Boaz Lerner	IEM	Steering Committee Member		
Dr. Oren Shriki	BSC	Steering Committee Member		
TBD		Administrative Manager	100%	

**D. Measurable Goals and Achievements of the Center’s activity for: (1) the first 2 years and (2) the following 2 years**

Examples of measurable achievements can be found in the Call for Proposals. Please connect the goals listed to the particular actions/objectives mentioned in section B above, when appropriate.

<b>Actions / Objectives</b>	<b>First 2 years</b>	<b>Following 2 years</b>
B.2.1 Hiring new faculty members	At least six faculty members hired in the core and related areas of data science, at least three of them at the rank of Senior Lecturer and higher.	At least six additional faculty members hired in the core and related areas of data science, at least three of them at the rank of Senior Lecturer and higher.
B.2.2 Maintenance of research labs	Six grants awarded, maintenance of at least four labs completed.	Six additional grants awarded, maintenance of all funded labs completed
B.2.3 Collaboration in the core areas of data science	13 yearly grants awarded, at least 10 of them resulted in submitting an external competitive grant and papers submitted to major conferences / journals. At least three competitive grants awarded and at least six papers accepted to major conferences / journals.	14 yearly grants awarded, at least 12 of them resulted in submitting an external competitive grant and papers submitted to major conferences / journals. At least four competitive grants awarded and at least 12 papers accepted to major conferences / journals.
B.2.4 Data scientists networking	At least 40 weekly seminars, three retreats, and two data science conferences. At least 50% participation of the Center members in the retreats and at least 100 participants in each conference.	At least 40 weekly seminars, three retreats, and two data science conferences. At least 75% participation of the Center members in the retreats and at least 150 participants in each conference.
B.2.5 Interdisciplinary collaboration in data science	13 yearly grants awarded, at least 10 of them resulted in submitting an external competitive grant and papers submitted to major conferences / journals. At least three competitive grants awarded and at least six papers accepted to major conferences / journals.	16 yearly grants awarded, at least 14 of them resulted in submitting an external competitive grant and papers submitted to major conferences / journals. At least five competitive grants awarded and at least 14 papers accepted to major conferences / journals.
B.2.6 Collaboration with government and industry	At least two cooperation agreements signed, four matching grants awarded.	At least four cooperation agreements signed, four matching grants awarded.

<b>Actions / Objectives</b>	<b>First 2 years</b>	<b>Following 2 years</b>
B.2.7 Computational infrastructure	Servers and cloud computing services used by at least 25% of the Center members	Servers and cloud computing services used by at least 40% of the Center members
B.2.8 New courses development	Development of two courses completed. At least one course taught once with a minimal enrolment of 20 students.	Each developed course taught at least twice to a total audience of at least 50 students
B.2.9 Data accessibility	At least three submitted / accepted papers using each database	At least five submitted / accepted papers using each database
B.2.10 Public outreach	Four hackathons organized, at least 80 participants in each hackathon	Four hackathons organized, at least 100 participants in each hackathon

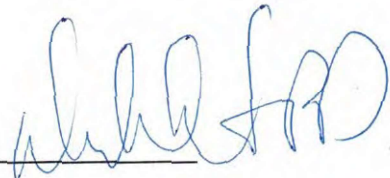


**E. The Institution's Commitment to Participate in the IDSI (Israel Data Science Initiative)**

Ben Gurion University of the Negev hereby commits to contribute its part in the IDSI's budget as stipulated in the conditions for receiving financial support in the Call for Proposals (see appendix A of the Call for Proposals).

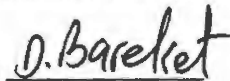
In addition, Ben Gurion University of the Negev commits to taking part in the IDSI's Board of Directors and to assisting in the performance of required tasks as mentioned in appendix A of the Call for Proposals, including the possibility of hosting the IDSI's CEO and her/his team and providing assistance in the management of the IDSI's budget, when required, in accordance with the Call for Proposals' principles and the decisions of the IDSI's Board of Directors.

President:



Prof. Daniel A. Chamovitz  
President  
Ben-Gurion University of the Negev

Chief Executive Officer:



**David Bareket**  
Vice President & Director General

Chief Financial Officer:



**Yossi Rokni**  
Deputy Director General  
for Planning Budgeting  
& Economics Division

## E. Appendix

### E.1 Complete List of the Center Members<sup>2</sup>

No.	First and last name	Title	Department	Research Interest(s)	Email Address
1	Tal Shay	Dr.	Biology	Bioinformatics and computational biology	<a href="mailto:talshay@bgu.ac.il">talshay@bgu.ac.il</a>
2	Yehuda Zeiri	Prof.	Biomedical Engineering	Statistical analysis and classification of experimental and theoretical data	<a href="mailto:yehuda.zeiri@gmail.com">yehuda.zeiri@gmail.com</a>
3	Robert Marks	Prof.	Biotechnology	Biosensors	<a href="mailto:rsmarks@bgu.ac.il">rsmarks@bgu.ac.il</a>
4	Oren Shriki	Dr.	Brain Sciences	Computational neuroscience	<a href="mailto:shrikio@bgu.ac.il">shrikio@bgu.ac.il</a>
5	Yair Neuman	Prof.	Brain Sciences	text analysis, homeland security, methodologies	<a href="mailto:yneuman@bgu.ac.il">yneuman@bgu.ac.il</a>
6	Anat Milo	Dr.	Chemistry	applicative machine learning for uncovering chemical reaction mechanisms and	<a href="mailto:anatmilo@bgu.ac.il">anatmilo@bgu.ac.il</a>
7	Barak Akabayov	Dr.	Chemistry	Drug discovery, computational analysis of experimental data	<a href="mailto:akabayov@bgu.ac.il">akabayov@bgu.ac.il</a>
8	Chen Avin	Prof.	Communication Systems Engineering	Social Network Analysis	<a href="mailto:avin@cse.bgu.ac.il">avin@cse.bgu.ac.il</a>
9	Dan Vilenchik	Dr.	Communication Systems Engineering	Online social networks, random matrix theory, sparse models	<a href="mailto:vilenchi@bgu.ac.il">vilenchi@bgu.ac.il</a>
10	Michael Segal	Prof.	Communication Systems Engineering	Network Analysis	<a href="mailto:segal@bgu.ac.il">segal@bgu.ac.il</a>
11	Zvi Lotker	Prof.	Communication Systems Engineering	Social networks, computer networks	<a href="mailto:zvilo@bgu.ac.il">zvilo@bgu.ac.il</a>
12	Amos Beimel	Prof.	Computer Science	Safe computing on big data	<a href="mailto:amos.beimel@gmail.com">amos.beimel@gmail.com</a>
13	Andrei Sharf	Prof.	Computer Science	image processing, video processing, depth image processing, 3D shape analysis, 3D shape retrieval and matching, 3D shape semantics, co-analysis	<a href="mailto:asharf@gmail.com">asharf@gmail.com</a>
14	Aryeh Kontorovich	Prof.	Computer Science	Machine Learning	<a href="mailto:karyeh@cs.bgu.ac.il">karyeh@cs.bgu.ac.il</a>
15	Chen Keasar	Dr.	Computer Science	Computational Structural Biology and bioinformatics in general.	<a href="mailto:chen@cs.bgu.ac.il">chen@cs.bgu.ac.il</a>
16	Dana Fisman	Dr.	Computer Science	Automata Learning, Learning for Program Verification	<a href="mailto:dana@cs.bgu.ac.il">dana@cs.bgu.ac.il</a>
17	Daniel Berend	Prof.	Computer Science	Statistics, Machine Learning	<a href="mailto:berend@cs.bgu.ac.il">berend@cs.bgu.ac.il</a>

---

<sup>2</sup> Sorted alphabetically by departments and member names

No.	First and last name	Title	Department	Research Interest(s)	Email Address
18	Danny Hender	Prof.	Computer Science	Cyber security	hendlerd@cs.bgu.ac.il
19	Ehud Gudes	Prof.	Computer Science	Data mining, Data security,	ehud@cs.bgu.ac.il
20	Eitan Bachmat	Prof.	Computer Science	Analysis of healthcare data, operations research, optimization of large systems	ebachmat@cs.bgu.ac.il
21	Eran Treister	Dr.	Computer Science	Deep Learning for imaging applications.	erant@bgu.ac.il
22	Eyal Shlomo Shimony	Prof.	Computer Science	AI	shimony@cs.bgu.ac.il
23	Gera Weiss	Dr.	Computer Science	Software Engineering, Control Systems, Internet of Things (IoT)	geraw@cs.bgu.ac.il
24	Jihad El Sana	Prof.	Computer Science	Image processing, pattern recognition, machine learning	el-sana@cs.bgu.ac.il
25	Michael Elhadad	Prof.	Computer Science	Natural Language Processing	michael.elhadad@gmail.com
26	Michael Elkin	Prof.	Computer Science	Graph sparsification, low-distortion embeddings, distributed algorithms, streaming algorithms	elkinm@bgu.ac.il
27	Michael Kodish	Prof.	Computer Science	SAT based constraint solving techniques (reasoning with millions of clauses)	mcodish@cs.bgu.ac.il
28	Michal Ziv-Ukelson	Prof.	Computer Science	Bioinformatics, biological data analysis and pattern discovery	michaluz@cs.bgu.ac.il
29	Moshe Sipper	Prof.	Computer Science	evolutionary algorithms, machine learning, artificial intelligence	sipper@gmail.com
30	Ofer Neiman	Prof.	Computer Science	Graph Algorithms for massive data	neimano@cs.bgu.ac.il
31	Ohad Ben-Shahar	Prof.	Computer Science	Computer Vision	ben-shahar@cs.bgu.ac.il
32	Oren Freifeld	Dr.	Computer Science	Computer Vision; Machine Learning	orenfr@cs.bgu.ac.il
33	Ronen Brafman	Prof.	Computer Science	AI planning	brafman@cs.bgu.ac.il
34	Shlomi Dolev	Prof.	Computer Science	Big data - compressed representation, privacy, distributed computing	shlomidolev@gmail.com
35	Sivan Sabato	Dr.	Computer Science	Machine Learning	sabatos@cs.bgu.ac.il
36	Naftali Lazarovitch	Prof.	Desert Studies	Agricultural system models	lazarovi@bgu.ac.il

No.	First and last name	Title	Department	Research Interest(s)	Email Address
37	Uri Roll	Dr.	Desert Studies	Text analysis, data mining, data-basing, machine learning	uri.roll@gmail.com
38	Karine van der Beek	Dr.	Economics	Economic growth, economic history data analysis	kvdbeek@bgu.ac.il
39	Koresh Galil	Dr.	Economics	Time-Series Analysis, Survival Analysis, Panel Data Analysis,	galilk@bgu.ac.il
40	Moshe Justman	Prof.	Economics	Economics of education	justman@bgu.ac.il
41	Oren Rigbi	Dr.	Economics	Big Data in Industrial Organization, Law & Economics	origbi@exchange.bgu.ac.il
42	Ran Eilat	Dr.	Economics	Information economics	raneilat@gmail.com
43	Shirlee Lichtman-Sadot	Dr.	Economics	Applied micro-economics - health, education and labor economics	shirlees@bgu.ac.il
44	Kobi Cohen	Dr.	Electrical and Computer Engineering	Statistical inference and learning, multi agent learning,	kobi.cohen10@gmail.com
45	Yaron Orenstein	Dr.	Electrical and Computer Engineering	Bioinformatics	yaronre@bgu.ac.il
46	Haim Permuter	Prof.	Electrical Engineering	Information Theory -Sequential Prediction of data -Markov Decision Process and Reinforcement Learning - Speaker recognition	haimp@bgu.ac.il
47	Yaron Orenstein	Dr.	Electrical Engineering	Machine learning applications to biological data	yaron.orenstein@gmail.com
48	Adrian Stern	Prof.	Electro-optics	Computational Imaging	stern@bgu.ac.il
49	Yitzhak Yitzhaky	Dr.	Electro-optics	Image Processing	ytshak@bgu.ac.il
50	Eran Ben-Elia	Dr.	Geography	Human mobility patterns and transportation systems	<a href="mailto:benelia@bgu.ac.il">benelia@bgu.ac.il</a>
51	Tal Savoray	Prof.	Geography	Geoinformatics	tsvoray@bgu.ac.il
52	Eitan Rubin	Dr.	Health Sciences	Precision medicine	erubin@bgu.ac.il
53	Esti Yeger-Lotem	Prof.	Health Sciences	Bioinformatics	estiyl@bgu.ac.il
54	Jacob Moran-Gilad	Prof.	Health Sciences	Epidemiology	giladko@post.bgu.ac.il
55	Tomer Hertz	Dr.	Health Sciences	Computational approaches to systems immunology	thertz@post.bgu.ac.il
56	Yigal Schwartz	Prof.	Hebrew Literature	Digital humanities, computational analysis of Hebrew literature	yigals@bgu.ac.il
57	Gideon Oron	Prof.	Industrial Engineering	Operations research in environment and water systems.	gidi@bgu.ac.il
58	Tal Oron-Gilad	Prof.	Industrial Engineering	Information visualization and decision making systems	orontal@bgu.ac.il

<b>No.</b>	<b>First and last name</b>	<b>Title</b>	<b>Department</b>	<b>Research Interest(s)</b>	<b>Email Address</b>
59	Yakir Berchenko	Dr.	Industrial Engineering	Statistical analysis of medical data	byakir@gmail.com
60	Adir Even	Dr.	Industrial Engineering and Management	Data / Information Management	adireven@gmail.com
61	Aharon Bar Hillel	Dr.	Industrial Engineering and Management	Computer vision, machine learning	aharon.barhillel@gmail.com
62	Boaz Lerner	Prof.	Industrial Engineering and Management	Machine Learning, Deep Learning	boaz@bgu.ac.il
63	Edna Schechtman	Prof.	Industrial Engineering and Management	Statistics	ednas@bgu.ac.il
64	Jonathan Rosenblatt	Dr.	Industrial Engineering and Management	Statistical Learning Theory	johnros@bgu.ac.il
65	Nir Nissim	Dr.	Industrial Engineering and Management	Cyber security	nirni@bgu.ac.il
66	Omer Lev	Dr.	Industrial Engineering and Management	Voting and decision-making and crowd-activities	omerlev@bgu.ac.il
67	Sigal Berman	Prof.	Industrial Engineering and Management	Robotics, Motor control	sigalbe@bgu.ac.il
68	Yakir Berchenko	Dr.	Industrial Engineering and Management	Data science and statistics	berchenk@bgu.ac.il
69	Yisrael Parmet	Prof.	Industrial Engineering and Management	Statistics, empirical modeling,	iparmet@exchange.bgu.ac.il
70	Coby Morvinski	Dr.	Management	Behavioral economics	cobym@bgu.ac.il
71	Guy Makov	Prof.	Materials Engineering	Machine learning for Materials Science	makovg@bgu.ac.il
72	Jennifer Oser	Dr.	Political Science	Meta-analysis of online digital media use and political participation	oser@post.bgu.ac.il
73	Galia Avidan	Prof.	Psychology	Network properties of the neural mechanisms underlying visual perception in the human	galiaa@bgu.ac.il
74	Michael Gilead	Dr.	Psychology	Application of data science methods in psychological and neuroscience research	michael.gilead@gmail.com
75	Nachshon Meiran	Prof.	Psychology	Psychometry	nachshon.meiran@gmail.com
76	Achiya Elyasaf	Dr.	Software and Information Systems Engineering	Evolutionary Algorithms	achiya@exchange.bgu.ac.il
77	Ariel Felner	Prof.	Software and Information Systems Engineering	AI	felner@exchange.bgu.ac.il

<b>No.</b>	<b>First and last name</b>	<b>Title</b>	<b>Department</b>	<b>Research Interest(s)</b>	<b>Email Address</b>
78	Armin Shmilovici	Dr.	Software and Information Systems Engineering	Machine Learning	armin@bgu.ac.il
79	Arnon Sturm	Dr.	Software and Information Systems Engineering	Knowledge graphs, knowledge management, database management	sturm@bgu.ac.il
80	Asaf Shabtai	Dr.	Software and Information Systems Engineering	Cyber security	shabtaia@bgu.ac.il
81	Assaf Zaritsky	Dr.	Software and Information Systems Engineering	Computational Biology	assafzar@gmail.com
82	Bracha Shapira	Prof.	Software and Information Systems Engineering	Text Analytics, Recommender Systems	bshapira@bgu.ac.il
83	Gilad Katz	Dr.	Software and Information Systems Engineering	Machine learning, deep learning, reinforcement learning	katz.gilad@gmail.com
84	Guy Shani	Dr.	Software and Information Systems Engineering	Recommender Systems, Image Analysis, Precision Agriculture	shanigu@bgu.ac.il
85	Isana Veksler-Lublinsky	Dr.	Software and Information Systems Engineering	Biological data analysis	isana18@gmail.com
86	Kobi Gal	Prof.	Software and Information Systems Engineering	Educational Data Mining, Time-Series Analysis, Natural Language Processing, Learning	kobig@exchange.bgu.ac.il
87	Lior Rokach	Prof.	Software and Information Systems Engineering	Machine Learning, Deep Learning	liorrk@bgu.ac.il
88	Mark Last	Prof.	Software and Information Systems Engineering	Time-Series Analysis, Natural Language Processing	mlast@bgu.ac.il
89	Meir Kalech	Dr.	Software and Information Systems Engineering	Time-Series Analysis, Anomaly Detection, Diagnosis	kalech@bgu.ac.il
90	Meirav Maimon	Dr.	Software and Information Systems Engineering	Information Visualization	meiravta@bgu.ac.il
91	Oren Tsur	Dr.	Software and Information Systems Engineering	Natural Language Processing Social Network Analysis Computational Social Science	orents@bgu.ac.il
92	Rami Puzis	Dr.	Software and Information Systems Engineering	Complex Networks Analysis	puzis@bgu.ac.il
93	Robert Moskovitch	Dr.	Software and Information Systems Engineering	Biomedical Informatics, Cyber Security	robertmo@bgu.ac.il
94	Roni Stern	Dr.	Software and Information Systems Engineering	Artificial Intelligence, Heuristic search, Automated diagnosis, Automated planning, multi-	sternron@post.bgu.ac.il
95	Yossi Oren	Dr.	Software and Information Systems Engineering	Machine Learning	yos@bgu.ac.il

<b>No.</b>	<b>First and last name</b>	<b>Title</b>	<b>Department</b>	<b>Research Interest(s)</b>	<b>Email Address</b>
96	Yuval Elovici	Prof.	Software and Information Systems Engineering	Cyber Security	elovici@bgu.ac.il
97	Yuval Shahaar	Prof.	Software and Information Systems Engineering	Biomedical Informatics, Cyber Security	yshahaar@bgu.ac.il
98	Zvi Perry	Dr.	Soroka Hospital and Health Sciences	Epidemiology	zperry@bgu.ac.il

## **E.2 10 Active Faculty Members in Core Fields - Relevant Articles**

### **E.2.1 Prof. Chen Avin**

- 1) Avin C, Lotker Z, Peleg D, Pignolet YA, Turkel I (2018) Elites in social networks: An axiomatic approach to power balance and Price's square root law. PLOS ONE 13(10): e0205820. <https://doi.org/10.1371/journal.pone.0205820>. **Rank: Q1. Topic: SNA.**
- 2) Michal Vaanunu, Chen Avin: Homophily and Nationality Assortativity Among the Most Cited Researchers' Social Network. ASONAM 2018: 584-586. **Rank: B. Topic: SNA**
- 3) Chen Avin, Avi Cohen, Pierre Fraigniaud, Zvi Lotker, David Peleg: Preferential Attachment as a Unique Equilibrium. WWW 2018: 559-568. **Rank: A\*. Topic: SNA**

### **E.2.2 Prof. Aryeh Kontorovich**

- 1) L. Gottlieb, A. Kontorovich, P. Nisnevitch. Nearly optimal classification for semimetrics. Journal of Machine Learning Research 18(37):1–22, 2017. **Rank: Q1. Topic: ML**
- 2) L. Gottlieb, A. Kontorovich, R. Krauthgamer. Efficient Regression in Metric Spaces via Approximate Lipschitz Extension. IEEE Transactions on Information Theory 63(8):4838-4849, 2017. **Rank: Q1. Topic: ML**
- 3) D. Berend, A. Kontorovich, G. Zagdanski. The expected missing mass under an entropy constraint. Entropy 19(7):315, 2017. **Rank: Q2. Topic: ML**
- 4) A. Kontorovich, S. Sabato, R. Uerner. Active Nearest-Neighbor Learning in Metric Spaces. Journal of Machine Learning Research 18: 195:1-195:38, 2017. **Rank: Q1. Topic: ML**
- 5) L. Gottlieb, A. Kontorovich, P. Nisnevitch. Near-optimal sample compression for nearest neighbors. IEEE Transactions on Information Theory 64(6): 4120-4128, 2018. **Rank: Q1. Topic: ML**
- 6) A. Kontorovich, I. Pinelis. Exact Lower Bounds for the Agnostic Probably-Approximately-Correct (PAC) Machine Learning Model. to appear in Annals of Statistics, 2018+. **Rank: Q1. Topic: ML**
- 7) A. Kontorovich, S. Sabato, R. Uerner. Active Nearest-Neighbor Learning in Metric Spaces. NIPS 2016. Long version. **Rank: A\*. Topic: ML**
- 8) A. Kontorovich, S. Sabato, R. Weiss. Nearest-Neighbor Sample Compression: Efficiency, Consistency, Infinite Dimensions. NIPS 2017. **Rank: A\*. Topic: ML**
- 9) L. Gottlieb, E. Kaufman, A. Kontorovich, G. Nivasch. Learning convex polytopes with margin. NIPS 2018. **Rank: A\*. Topic: ML**

### **E.2.3 Prof. Michael Elhadad**

- 1) Jumana Nassour, Michael Elhadad, Arnon Sturm, Eric Yu, Evaluating the comprehension of means-ends maps, Software & Systems Modeling, Springer, 2018. **Rank: Q2. Topic: NLP**
- 2) Tal Baumel, Jumana Nassour-Kassis, Raphael Cohen, Michael Elhadad, Noemie Elhadad Multi-label classification of patient notes a case study on ICD code assignment, AAI, 2018. **Rank: A\*. Topic: NLP**
- 3) Avi Hayoun and Michael Elhadad, The Hebrew FrameNet Project, LREC (2016). **Rank: C. Topic: NLP**
- 4) Tal Baumel, Raphael Cohen and Michael Elhadad, Topic Concentration in Query Focused Summarization Dataset AAI (2016). **Rank: A\*. Topic: NLP**



#### E.2.4 Prof. Ohad Ben-Shahar

- 1) E. Barnea and O. Ben-Shahar, Contextual Object Detection with a Few Relevant Neighbors , In the Proceedings of the Asian Conferenced on Computer Vision (ACCV), 2018. **Rank: B. Topic: CV (Computer Vision)**
- 2) E. Taig and O. Ben-Shahar, Gradient Surfing - a New Deterministic Approach for Low Dimensional Global Optimization , The Journal of Optimization Theory and Applications (JOTA) , 2018. **Rank: Q2. Topic: CV**
- 3) G. Nir, B. Arad, and O. Ben-Shahar, Multi inducer grouping for curve completion: Perceptual and computational exploration , the Journal of Vision (JOV), 17(9):8, 1-15, 2017. **Rank: Q2. Topic: CV**
- 4) E. Barnea, R. Mairon, and O. Ben-Shahar, Colour-Agnostic Shape-Based 3D Fruit Detection for Crop Harvesting Robots , Biosystems Engineering, 146, pp. 57-70, 2016. **Rank: Q1. Topic: CV**
- 5) R. Ben-Ari and O. Ben-Shahar, Computationally efficient tracker with direct appearance-kinematic measure and adaptive Kalman filter , Journal of Real-Time Image Processing, 2016. **Rank: Q2. Topic: CV**
- 6) E. Barnea and O. Ben-Shahar, Curve Reconstruction via the Global Statistics of Natural Curves , In the Proceedings of the IEEE International Conference on Computer Vision and Pattern Recognition (CVPR), 2018. **Rank: A\*. Topic: CV**
- 7) B. Arad, and O. Ben-Shahar, Filter Selection for Hyperspectral Estimation , In the Proceedings of the IEEE International Conference on Computer Vision (ICCV), 2017. **Rank: A\*. Topic: CV**
- 8) S. Gur, and O. Ben-Shahar, From Square Pieces to Brick Walls: The Next Challenge in Solving Jigsaw Puzzles , In the Proceedings of the IEEE International Conference on Computer Vision (ICCV), 2017. **Rank: A\*. Topic: CV**
- 9) B. Arad and O. Ben-Shahar, Sparse Recovery of Hyperspectral Signal from Natural RGB Images , In the Proceedings of the European Conference on Computer Vision (ECCV), 2016. **Rank: A. Topic: CV**

#### E.2.5 Dr. Sivan Sabato

- 1) S. Sabato, T. Hess, ""Interactive Algorithms: Pool, Stream and Precognitive Stream"", Journal of Machine Learning Research, 18(229):1--39, 2018. **Rank: Q1. Topic: ML**
- 2) A. Kontorovich, S. Sabato, R. Uner, ""Active Nearest-Neighbor Learning in Metric Spaces"", Journal of Machine Learning Research, 18(195):1--38, 2018. **Rank: Q1. Topic: ML**
- 3) D. Hsu and S. Sabato, ""Loss minimization and parameter estimation with heavy tails"", Journal of Machine Learning Research, 17(18):1-40, 2016." **Rank: Q1. Topic: ML**
- 4) S. Dasgupta, A. Dey, N. Roberts, S. Sabato, ""Learning from discriminative feature feedback"", Advances in Neural Information Processing Systems 31 (NeurIPS (NIPS) ), 3959--3967, 2018. **Rank: A\*. Topic: ML**
- 5) G. Keren, S. Sabato, B. Schuller, ""Fast Single-Class Classification and the Principle of Logit Separation"", International Conference on Data Mining (ICDM), 227--236, 2018. **Best Student Paper Award. Rank: A\*. Topic: ML**
- 6) A. Kontorovich, S. Sabato, R. Weiss, ""Nearest-Neighbor Sample Compression: Efficiency, Consistency, Infinite Dimensions"", Advances in Neural Information Processing Systems 30 (NIPS), 1573--1583, 2017. **Rank: A\*. Topic: ML**

- 7) G. Keren, S. Sabato, B. Schuller, ""Tunable Sensitivity to Large Errors in Neural Network Training"", 31st AAAI Conference on Artificial Intelligence, 2017. **Rank: A\*. Topic: ML**
- 8) A. Kontorovich, S. Sabato, R. Urner, ""Active Nearest-Neighbor Learning in Metric Spaces"", Advances in Neural Information Processing Systems 29 (NIPS), 856-864, 2016. **Rank: A\*. Topic: ML**
- 9) S. Sabato and T. Hess, ""Interactive Algorithms: from Pool to Stream"", Proceedings of the 29th Annual Conference on Learning Theory (COLT), JMLR Workshop and Conference Proceedings 49:1419-1439, 2016. **Rank: A\*. Topic: ML**

### **E.2.6 Prof. Boaz Lerner**

- 1) Asbeh, N., and Lerner, B. (2016). "Learning latent variable models by pairwise cluster comparison. Part I – Theory and overview," Journal of Machine Learning Research 17 (224), 1-52: **Rank: Q1. Topic: ML.**
- 2) Asbeh, N., and Lerner, B. (2016). "Learning latent variable models by pairwise cluster comparison. Part II – Algorithm and evaluation," Journal of Machine Learning Research 17 (233), 1-45: **Rank: Q1. Topic: ML.**
- 3) Toch, E., Lerner, B., Ben-Zion, E., and Ben-Gal, I. (2018). "Analyzing large-scale human mobility data: A survey of machine learning methods and applications," Knowledge and Information System, March, 1-23: **Rank: Q1. Topic: ML.**
- 4) Ben Zion, E., and Lerner, B. (2018). "Identifying and predicting social lifestyles in people's trajectories by neural networks," EPJ Data Science, 7(45), 1-27: **Rank: Q1. Topic: ML.**
- 5) Gordon, J. and Lerner, B. (2016). "Exposing and modeling underlying mechanisms in ALS with machine learning", the 23rd International Conference on Pattern Recognition (ICPR), Cancun, Mexico. **Rank: B. Topic: ML**
- 6) Halbersberg, D. and Lerner, B. (2016). "Learning a Bayesian network classifier by jointly maximizing accuracy and information", 22nd European Conference on Artificial Intelligence (ECAI), The Hague, Holland. **Rank: A. Topic: ML**
- 7) Ben Zion, E., and Lerner, B. (2017). "Learning human behaviors and lifestyle by capturing temporal relations in mobility patterns", European Symposium on Artificial Networks, Computational Intelligence and Machine Learning (ESANN2017), Bruges, Belgium. **Rank: B. Topic: ML**
- 8) Nahon, A., and Lerner, B. (2018). "Temporal modeling of ALS using longitudinal data and long-short term memory-based algorithm", European Symposium on Artificial Networks, Computational Intelligence and machine Learning (ESANN2018), Bruges, Belgium, 609-614. **Rank: B. Topic: ML**

### **E.2.7 Dr. Jonathan Rosenblatt**

- 1) Rosenblatt, J.D., Benjamini, Y.. 2018. On mixture alternatives and Wilcoxon's signed-rank test. The American Statistician. Vol 72.4 p. 344-347. **Rank: A. Topic: Statistics.**
- 2) Berchenko, Y., Rosenblatt, J.D., Frost, S.D.W.PI. 2017. Modeling and analyzing respondent-driven sampling as a counting process. Biometrics. Vol. 73. p.1189-1198. **Rank: B. Topic: Statistics**
- 3) Rosenblatt, J.D., and Nadler, B.. 2016. On the Optimality of Averaging in Distributed Statistical Learning. Information and Inference. Vol. 5, No. 4. p.379-404. **Topic: Statistics**
- 4) Rosenblatt, J.D., Benjamini, Y. On mixture alternatives and Wilcoxon's signed-rank test. Joint Statistical Meetings (JSM). Denver USA. 2019. **Topic: Statistics**

- 5) Rosenblatt, J.D., Benjamini Y., Gilron R., Mumamel RPI., Goeman J.J. 2017. Better-Than-Chance Classification for Signal Detection. Computational and Methodological Statistics (CMS). UK, 2017. **Topic: Statistics**

### E.2.8 Prof. Bracha Shapira

- 1) David Ben-Shimon, Lior Rokach, Guy Shani, and Bracha Shapira. 2016. Anytime Algorithms for Recommendation Service Providers. ACM Trans. Intell. Syst. Technol. 7, 3, Article 43 (February 2016), 26 pages. **Rank: Q1. Topic: RS (Recommender Systems).**
- 2) Edita Grolman, Ariel Bar, Bracha Shapira, Lior Rokach, Aviram Dayan, Utilizing transfer learning for in-domain collaborative filtering, Knowledge-Based Systems, Volume 107, 2016, Pages 70-82, **Rank: Q1. Topic: ML.**
- 3) David Ben-Shimon, Lior Rokach, Bracha Shapira, An ensemble method for top-N recommendations from the SVD, Expert Systems with Applications, Volume 64, 2016, Pages 84-92, **Rank: Q1. Topic: RS**
- 4) Moran Beladev, Lior Rokach, Bracha Shapira, Recommender systems for product bundling, Knowledge-Based Systems, Volume 111, 2016, Pages 193-206. **Rank: Q1. Topic: RS**
- 5) Moshe Unger, Ariel Bar, Bracha Shapira, Lior Rokach, Towards latent context-aware recommendation systems, Knowledge-Based Systems, Volume 104, 2016, Pages 165-178. **Rank: Q1. Topic: RS**
- 6) Roman Vainshtein, Asnat Greenstein-Messica, Gilad Katz, Bracha Shapira, and Lior Rokach. 2018. A Hybrid Approach for Automatic Model Recommendation. In Proceedings of the 27th ACM International Conference on Information and Knowledge Management (CIKM '18). ACM, New York, NY, USA, 1623-1626. **Rank: A. Topic: ML**
- 7) Ido Guy and Bracha Shapira. 2018. From Royals to Vegans: Characterizing Question Trolling on a Community Question Answering Website. In The 41st International ACM SIGIR Conference on Research & Development in Information Retrieval (SIGIR '18). ACM, New York, NY, USA, 835-844. **Rank: A\*. Topic: TA (Text Analytics)**
- 8) Ido Guy, Victor Makarenkov, Niva Hazon, Lior Rokach, and Bracha Shapira. 2018. Identifying Informational vs. Conversational Questions on Community Question Answering Archives. In Proceedings of the Eleventh ACM International Conference on Web Search and Data Mining (WSDM '18). ACM, New York, NY, USA, 216-224. **Rank: A\*. Topic: TA**

### E.2.9 Prof. Lior Rokach

- 1) Eitan Menachem, Alon Schclar, Lior Rokach, Yuval Elovici, XML-AD: Detecting Anomalous Patterns In XML Documents, Information Sciences, Vol. 326:71-88, 2016. **Rank: Q1. Topic: Text Analytics.**
- 2) Lior Rokach, Decision Forest: Twenty Years of Research, Information Fusion, Volume 27, January 2016, Pages 111–125. **Rank: Q1. Topic: ML.**
- 3) Dudi Ben-Shimon, Lior Rokach, Bracha Shapira, Guy Shani, Anytime Algorithms for Recommendation Service Providers, ACM Transactions on Intelligent Systems and Technology, 2016, 7 (3): 43-26. **Rank: Q1. Topic: RS.**
- 4) Moshe Unger, Ariel Bar, Bracha Shapira, Lior Rokach, Towards Latent Context-Aware Recommendation Systems, Knowledge-Based Systems, Vol. 104: 165–178, 2016. **Rank: Q1. Topic: RS.**

- 5) Edita Grolman, Ariel Bar, Bracha Shapira, Lior Rokach, Aviram Dayan, Utilizing Transfer Learning for In-Domain Collaborative Filtering, Knowledge-Based Systems, Vol. 107: 70-82, 2016. **Rank: Q1. Topic: ML.**
- 6) Dudi Ben-Shimon, Lior Rokach, Bracha Shapira, An Ensemble Method for Top-N Recommendations from the SVD, Expert Systems With Applications, Vol. 64: 84-92, 2016. **Rank: Q1. Topic: ML.**
- 7) Olga Peled, Michael Fire, Lior Rokach and Yuval Elovici, Matching Entities Across Online Social Networks, Neurocomputing, 210: 91-106 (2016). **Rank: Q1. Topic: SNA.**
- 8) Moran Beladev, Bracha Shapira, Lior Rokach, Recommender Systems for Product Bundling, Knowledge-Based Systems, 111: 193-206 (2016). **Rank: Q1. Topic: RS.**
- 9) Ido Blank, Lior Rokach, Guy Shani, Leveraging Metadata to Recommend Keywords for Academic Papers, Journal of the Association for Information Science and Technology, 67(12), 3073-3091 (2016). **Rank: Q2. Topic: Text Analytics.**
- 10) Asi Messica, Lior Rokach, Asaf Shabtai, Personal-Discout Sensitivity Prediction for Mobile Coupon Conversion Optimization, Journal of the Association for Information Science and Technology (2017). **Rank: Q2. Topic: Text Analytics**
- 11) Nir Ofek, Asaf Shabtai, Lior Rokach, Fast-CBUS: A Fast Clustering-Based Undersampling Method for Addressing the Class Imbalance Problem, Neurocomputing 243: 88-102 (2017). **Rank: Q1. Topic: ML.**
- 12) David Biton, Meir Kalech, Lior Rokach, FSCOAL- Parallel Simultaneous Fuzzy Co-Clustering and Learning, International Journal of Intelligent Systems, 33(7): 1364-1380 (2016 IF = 2.639, JR = 31/133, Q1 in Computer Science, AI). **Rank: Q1. Topic: ML.**
- 13) Omer Sagi, Lior Rokach, Ensemble Learning - A Survey, Wiley Interdisciplinary Reviews-Data Mining and Knowledge Discovery (Invited Paper), 8(4) (2016 IF = 2.11, JR = 29/104, Q2 in Computer Science, Theory & Methods). **Rank: Q2. Topic: ML.**
- 14) Asi Messica, Lior Rokach, Personal Price Aware Multi-Seller Recommender System: Evidence from eBay, Knowledge-Based Systems 150: 14-26 (2018). **Rank: Q1. Topic: RS.**
- 15) Asi Messica, Lior Rokach, Michael Friedmann, Session-Based Recommendations Using Item Embedding, Proceedings of the 22nd International Conference on Intelligent User Interface (ACM IUI), 13-16 March, 2017, Limassol, Cyprus, pp 629-633. **Rank: A. Topic: RS.**
- 16) Ido Guy, Victor Makarenkov, Niva Hazon, Lior Rokach and Bracha Shapira, Identifying Informational vs. Conversational Questions on Community Question Answering Archives, The 11th ACM International Conference on Web Search and Data Mining, Los Angeles, California, USA 2018, pp. 216-224 (Acceptance rate: 16%). **Rank: A\*. Topic: TA**
- 17) Roman Vainshtein, Asnat Greenstein-Messica, Gilad Katz, Bracha Shapira and Lior Rokach, "A Hybrid Approach for Automatic Model Recommendation", ACM CIKM, 22-26 October 2018, Turin, Italy (Acceptance rate 23.4%). **Rank: A. Topic: ML**

#### E.2.10 Prof. Mark Last

- 1) M. Last, N. Rabinowitz, and G. Leonard (2016). "Predicting the Maximum Earthquake Magnitude from Seismic Data in Israel and Its Neighboring Countries", PLoS ONE 11(1): **Rank: Q1. Topic: Spatio-Temporal Data Mining.**
- 2) M. Last, O. Tosas, T. G. Cassarino, Z. Kozlakidis, and J. Edgeworth (2016). "Evolving classification of intensive care patients from event data", Artificial

Intelligence in Medicine, Vol. 69, May 2016, pp. 22-32. **Rank: Q1. Topic: Temporal Data Mining.**

- 3) N. Eyal, M. Last, and E. Rubin (2017). "PCM-SABRE: A platform for benchmarking and comparing outcome prediction methods in precision cancer medicine", BMC Bioinformatics, Vol. 18, No. 1, p. 40: **Rank: Q1. Topic: Precision Medicine.**
- 4) A. Weinberg and M. Last (2017). "Interpretable Decision-Tree Induction in Big Data Parallel Framework", International Journal of Applied Mathematics and Computer Science (AMCS), Vol. 27, No. 4, pp. 737–748. **Rank: Q1. Topic: ML.**
- 5) M. Litvak, N. Vanetik, M. Last, and E. Churkin (2016). "MUSEEC: A Multilingual Text Summarization Tool". In Proceedings of the 54th Annual Meeting of the Association for Computational Linguistics (ACL 2016)—System Demonstrations, pp. 73–78, Berlin, Germany, August 7-12, 2016. **Rank: A\*. Topic: NLP.**
- 6) M. Last (2016). "Multi-target Classification: Methodology and Practical Case Studies". Proceedings of European Conference on Machine Learning and Principles and Practice of Knowledge Discovery (ECML-PKDD 2016), pp. 280-283, Riva del Garda, Italy, September 19-23, 2016. **Rank: A. Topic: ML**
- 7) R. Chongtay, M. Last and B. Berendt (2018). "Responsive News Summarization for Ubiquitous Consumption on Multiple Mobile Devices". In 23rd International Conference on Intelligent User Interfaces (IUI '18). ACM, New York, NY, USA, pp. 433-437. **Rank: A. Topic: Text Analytics.**
- 8) E. Tsur, M. Last, V. F Garcia, R. Udassin, M. Klein, and E. Brotfain (2018). "Hypotensive Episode Prediction in ICUs via Observation Window Splitting". In: Brefeld U. et al. (eds.) Machine Learning and Knowledge Discovery in Databases. ECML PKDD 2018. Lecture Notes in Computer Science, vol 11053. Springer. **Rank: A. Topic: Time Series Analysis.**

### **E.3 10 Active Faculty Members in Related Fields - Relevant Articles**

\*\*\* - article that contributed to data science in a related field

#### **E.3.1 Dr. Tal Shay**

- 1) Ner-Gaon H, Melchior A, Golan N, Ben Haim Y, Shay T (2017). JingleBells: A repository of immune related single-cell RNA-sequencing datasets. Journal of Immunology 198(9):3375-3379. **Q2.**
- 2) Lieberman Y, Rokach L, Shay T (2018). CaSTLe – Classification of single cells by transfer learning: Harnessing the power of publicly available single cell RNA sequencing experiments to annotate new experiments. PLOS One 13(10): e0205499. **Q1\*\*\***

#### **E.3.2 Prof. Danny Hendler**

- 1) Yehonatan Cohen, Danny Hendler, Amir Rubin: Detection of malicious webmail attachments based on propagation patterns. Knowl.-Based Syst. 141: 67-79 (2018) **Q1\*\*\***
- 2) Yehonatan Cohen, Daniel Gordon, Danny Hendler: Early detection of spamming accounts in large-Scale service provider networks. Knowl.-Based Syst. 142: 241-255 (2018) **Q1\*\*\***
- 3) Yehonatan Cohen, Danny Hendler: Scalable Detection of Server-Side Polymorphic Malware. Knowl.-Based Syst. 156: 113-128 (2018). **Q1**
- 4) Danny Hendler, Shay Kels, Amir Rubin: Detecting Malicious PowerShell Commands using Deep Neural Networks. AsiaCCS 2018: 187-197. **B\*\*\***

- 5) Yehonatan Cohen, Danny Hendler, Amir Rubin: Node-centric detection of overlapping communities in social networks. ASONAM 2016: 1384-1385. **B\*\*\***

### **E.3.3 Dr. Eitan Rubin**

- 1) Soria, Jean-Charles, Rodon Ahnert, Jordi, Berger, Raanan, Miller, Wilson H., Brana, Irene, Lorient, Yohann, Mughal, Tariq I, Lazar, Vladimir, Wunder, Fanny, Bresson, Catherine, Koscielny, Serge, Afshar, Mohammad, Saintigny, Pierre, Tsimberidou, Apostolia Maria, Richon, Catherine, Batist, Gerald, Onn, Amir, Ackerstein, Aliza, Rubin, Eitan, and Kurzrock, Razelle (2017). WINTHER: An international study to select rational therapeutics based on the analysis of matched tumor and normal biopsies in subjects with advanced malignancies. *Journal of Clinical Oncology* 35, 15. **Q1**
- 2) Eyal-Altman, N., Last, M., & Rubin, E. (2017). PCM-SABRE: a platform for benchmarking and comparing outcome prediction methods in precision cancer medicine. *BMC bioinformatics*, 18(1), 40. **Q1\*\*\***

### **E.3.4 Prof. Esti Yeger-Lotem**

- 1) Integrating Riol activities discloses its nutrient-activated network in *Saccharomyces cerevisiae*. Iacovella MG, Bremang M, Basha O, Giacò L, Carotenuto W, Golfieri C, Szakal B, Dal Maschio M, Infantino V, Beznoussenko GV, Joseph CR, Visintin C, Mironov AA, Visintin R, Branzei D, Ferreira-Cerca S, Yeger-Lotem E, De Wulf P. *Nucleic Acids Res.* 2018 Sep 6;46(15):7586-7611. doi: 10.1093/nar/gky618. PMID: 30011030 Free PMC Article. **Q1**
- 2) Role of duplicate genes in determining the tissue-selectivity of hereditary diseases. Barshir R, Hekselman I, Shemesh N, Sharon M, Novack L, Yeger-Lotem E. *PLoS Genet.* 2018 May 3;14(5):e1007327. doi: 10.1371/journal.pgen.1007327. eCollection 2018 May. PMID: 29723191 **Q1**
- 3) The DifferentialNet database of differential protein-protein interactions in human tissues. Basha O, Shpringer R, Argov CM, Yeger-Lotem E. *Nucleic Acids Res.* 2018 Jan 4;46(D1):D522-D526. doi: 10.1093/nar/gkx981. PMID: 29069447. **Q1**
- 4) The TissueNet v.2 database: A quantitative view of protein-protein interactions across human tissues. Basha O, Barshir R, Sharon M, Lerman E, Kirson BF, Hekselman I, Yeger-Lotem E. *Nucleic Acids Res.* 2017 Jan 4;45(D1):D427-D431. doi: 10.1093/nar/gkw1088. PMID: 27899616. **Q1**
- 5) MotifNet: a web-server for network motif analysis. Smoly IY, Lerman E, Ziv-Ukelson M, Yeger-Lotem E. *Bioinformatics.* 2017 Jun 15;33(12):1907-1909. doi: 10.1093/bioinformatics/btx056. PMID: 28165111. **Q1\*\*\***
- 6) An Asymmetrically Balanced Organization of Kinases versus Phosphatases across Eukaryotes Determines Their Distinct Impacts. Smoly I, Shemesh N, Ziv-Ukelson M, Ben-Zvi A, Yeger-Lotem E. *PLoS Comput Biol.* 2017 Jan 30;13(1):e1005221. doi: 10.1371/journal.pcbi.1005221. PMID: 28135269. **Q1**

### **E.3.5 Prof. Jacob Moran-Gilad**

- 1) Marchaim D, Levit D, Zigran R, Gordon MT, Lazarovitch T, Carrico JA, Chalifa-Caspi V, Moran-Gilad J. Clinical and molecular epidemiology of *Acinetobacter baumannii* bloodstream infections in an endemic setting. *Future Microbiology* 2017; 12: 271-283 **Q2**.
- 2) Gordon M, Yakunin E, Valinsky LC Chalifa-Caspi V, Moran-Gilad I. A Bioinformatics Tool for Ensuring the Backwards Compatibility of *Legionella pneumophila* Typing in the Genomic Era. *Clinical Microbiology and Infection* 2017; 23: 306-310. **Q1**

- 3) Moran-Gilad J, Rokney A, Danino D, Ferdous M, Alsana F, Baum M, Dukhan L, Agmon V, Anuka E, Valinsky L, Yishay R, Grotto I, Rossen JWA, Gdalevich M. Real-Time Genomic Investigation Underlying the Public Health Response to a Shiga Toxin-Producing Escherichia Coli O26:H11 Outbreak in a Nursery. *Epidemiology & Infection* 2017; 19: 1-9. **Q2**.
- 4) Petzold M, Prior K, Moran-Gilad J, Harmsen D, Luck C. Epidemiological information is key when interpreting whole-genome sequencing data – Lessons learned from a large Legionella pneumophila outbreak to date in Warstein, Germany, 2013. *Euro Surveillance* 2017; 22: **Q1\*\*\*\***.
- 5) Motro YC Moran-Gilad J. Microbial Metagenomics Mock Scenario-based Sample Simulation (M3S3). *Clinical Microbiology and Infection* 2018; 24: 308 e1-4 **Q1**
- 6) van Belkum A, Bachmann TT, Lüdke G, Lisby JG, Kahlmeter G, Mohess A, Becker K, Hays JP, Woodford N, Mitsakakis K, Moran-Gilad J, Vila J, Harald P, Rex JH, Dunne Jr WM and the JPI-AMR AMR-RDT Working Group. Developmental roadmap for antimicrobial susceptibility testing. *Nature Reviews Microbiology* 2018; doi: 10.1038/s41579-018-0098-9 **Q1**
- 7) Rokney A, Valinsky L, Moran-Gilad J, Vranckx K, Agmon V, Weinberger M. Whole genome analysis of the major Campylobacter jejuni lineages in Israel. *Frontiers in Microbiology*. *Frontiers in Microbiology* 2018; doi: 10.3389/fmicb.2018.02432. **Q1**
- 8) Wüthrich D, Gautsch S, Spieler-Denz R, Dubuis O, Gaia V, Moran-Gilad J, Hinic V, Seth-Smith H, Nickel C, Tschudin-Sutter S, Bassetti S, Haenggi MC, Brodmann P, Fuchs S, Egli A. Air-conditioner cooling towers as complex reservoirs and continuous source of Legionella pneumophila infection evident by genomic analysis. *Euro Surveillance* (in press). **Q1\*\*\*\***

### **E.3.6 Prof. Ariel Felner**

- 1) Robert HoltePI, Ariel FelnerPI, Guni SharonC and Nathan SturtevantPI: Bidirectional Search That Is Guaranteed to Meet in the Middle. *Artificial Intelligence Journal (AIJ)*, October 2017, Vol 252: pp: 232-366 (2017). **Q1**.
- 2) Erez Karpas, Oded Bezalel, Solomon Eyal Shimony, David Tolpin and Ariel Felner, “Rational Deployment of Multiple Heuristics in Optimal State-space Search”, *Artificial Intelligence (AIJ)* 256:181-210, 2018. **Q1**
- 3) Rami Puzis, Liron Samama-Kachko, Roni Stern, and Ariel Felner, “Target Oriented Network Intelligence Collection: Efficient Exploration of Social Networks”, *World Wide Web Journal (WWWJ)*, 2018. **Q1\*\*\*\***
- 4) Nathan SturtevantPI, Ariel FelnerPI, and Malte-HemmlertC: "" Value Compression of Pattern Databases "", *AAAI-2017*, February 2017. **A\* \*\*\*\***
- 5) Shahaf ShperbergS, Eyal ShimonyPI and Ariel FelnerPI, “Monte-Carlo Tree Search using Batch Value of Perfect Information”, *Uncertainty in AI conference (UAI-2017)*. **A\***
- 6) Nathan SturtevantPI, Ariel FelnerPI, “Recent Achievements In Bidirectional Search”, Accepted to the Senior Member Track of *AAAI-2018*. **A\***
- 7) Ariel FelnerPI, Jiaoyang, Eli Boyraski, Hang Ma, Liron Cohen, T. K. Satish Kumar, and Sven Koenig: “Adding heuristics to CBS”, Accepted to *ICAPS-2018*. **A\***.
- 8) Hang Ma, Glenn Wagner, Jiaoyang, Li, Ariel Felner, T. K. Satish Kumar, and Sven Koenig: “Multi-Agent Path Finding with Deadlines”, Accepted to *IJCAI-2018*. **A\***.
- 9) Liron Cohen, Ariel Felner, T. K. Satish Kumar, and Sven Koenig: “Anytime Focal Search with Applications”, Accepted to *IJCAI-2018*. **A\***.

- 10) Thayne Walker, Nathan Sturtevant and Ariel Felner, "Extended Increasing Cost Tree Search for Non-Unit Cost Domains", Accepted to IJCAI-2018. **A\***.

### **E.3.7 Prof. Yuval Elovici**

- 1) Mirski Y., Shabtai A., Shapira B., Rokach L., Elovici Y., "Anomaly detection for smartphone data streams", *Pervasive and mobile Computing* 35:83-107(2017). **Q1\*\*\***.
- 2) Nissim N., Cohen A., Elovici Y., "ALDOCX: Detection of unknown Malicious Microsoft Office Documents Using Designated Active Learning Methods Based on New structural feature extraction Methodology." *IEEE Trans. Information Forensics and security* 12(3): 631-646 (2017). **Q1\*\*\***
- 3) Harel Y., Ben-Gal I., Elovici Y., " Cyber Security and the Role of Intelligent Systems in Addressing its Challenges" *ACM TIST* 8(4) 49:1-49:12 (2017). **Q1**
- 4) Guri M., Monitz M., Elovici Y., "Bridging the Air Gap between Isolated Networks and Mobile Phones in a Practical Cyber-Attack" *ACM TIST* 8(4): 50:1-50:25 (2017). **Q1**
- 5) Zilberman P., Puzis R. Elovici Y., "On Network Footprint of Traffic Inspection and Filtering at Global Scrubbing Centers" *IEEE Trans. Dependable Sec .Comput.* 14(5):521-534 (2017). **Q1\*\*\***
- 6) Nissim N., Yahalom R., Elovici Y., "USB-based attacks" *Computers & Security* 70: 675-688 (2017). **Q2**
- 7) Nissim N., Shahar Y., Elovici Y., Hripscak G., Moskovitch R., "Inter-labeler and intra-labeler variability of condition severity classification models using active and passive learning methods" *Artificial Intelligence in Medicine* 81:12-32 (2017). **Q1\*\*\***
- 8) Katzir Z., Elovici Y., "Quantifying the resilience of machine learning classifiers used for cyber security " *Expert Syst. Appl.* 92:419-429 (2018). **Q1\*\*\***
- 9) Iacovazzi A., Sanat S., Frassinelli D., Elovici Y., "DropWat:An invisible network flow watermark for data Exfiltration traceback." *IEEE Trans. Information forensics and security* 13(5): 1139-1154 (2018). **Q1**
- 10) Nissim N., Lapidot Y., Cohen A., Elovici Y., " Trusted system-calls analysis methodology aimed at detection of compromised virtual machines using sequential mining" *Knowl.-Based Syst.* 153: 147-175 (2018). **Q1\*\*\***

### **E.3.8 Dr. Robert Moskovitch**

- 1) Robert Moskovitch, Hyunmi Choi, George Hripsack, Nicholas Tatonetti, Prognosis of Clinical Procedures with Temporal Patterns and One Class Feature Selection, *ACM/IEEE Transactions on Computational Biology and Bioinformatics*, 2017. **Q1\*\*\***
- 2) Nir Nissim, Yuval Elovici, Yuval Shahar, George Hripscak, Robert Moskovitch, Inter-Labeler Variability of Condition-Severity Classification Models Using Active and Passive Learning Models, *Artificial Intelligence in Medicine*, 2017. **Q1\*\*\***
- 3) Robert Moskovitch, Fernanda Polubriaginof, Aviram Weiss, Patrick Ryan, Nicholas Tatonetti, Procedure Events Prediction via Time Intervals Analytics, *Journal of Biomedical Informatics*, 2017. **Q2**
- 4) Alexander Shknevsky, Yuval Shahar, Robert Moskovitch, Consistent Discovery of Frequent Interval-Based Temporal Patterns in Chronic Patients' Data, *Journal of Biomedical Informatics*, 2017. **Q2**



### **E.3.9 Prof. Yuval Shahar**

- 1) Nissim, N., Shahar, Y., Elovici, Y., Hripsak, G., and Moskovitch, R. (2017). Inter-labeler variability of condition-severity classification models using active and passive learning methods. *Artificial Intelligence in Medicine* 81:12–32. **Q1\*\*\***
- 2) Goldstein, A., Shahar, Y., Orenbuch, E., and Cohen, M. (2017). Evaluation of an automated knowledge-based textual summarization system for longitudinal, multivariate clinical data. *Artificial Intelligence in Medicine* 82:20–33. **Q1\*\*\***
- 3) Shknevsky, A., Shahar, Y., and Moskovitch, R. (2017). Consistent discovery of frequent interval-based temporal patterns in chronic patients' data. *The Journal of Biomedical Informatics* 75:83-95. **Q2.**

### **E.3.10 Dr. Zvi Perry**

- 1) A. Acker, Z. H. Perry, S. Blum, G. Shaked & A. Korngreen. Immediate percutaneous sacroiliac screw insertion for unstable pelvic fractures: is it safe enough? *European journal of trauma and emergency surgery*, 2018, 44 (2), 163-9. **Q2**
- 2) Maor Lewis, Uri Netz, Solly Mizrahi, Eliezer Avinoah, Doron Gal & Zvi H. Perry. Do male patients benefit from laparoscopic adjustable gastric banding more than female patients? A retrospective cohort study. *Obesity Surgery*. 2017 Sep 1. **Q1\*\*\***
- 3) Netz U, Perry Z, Mizrahi S, Kirshtein B, Czeiger D, Sebbag G, Reshef A, Douvdevani A. Cell-free deoxyribonucleic acid as a prognostic marker of bowel ischemia in patients with small bowel obstruction. *Surgery*. 2017 Aug 7. **Q1\*\*\***