Meir Kalech June 2022

CURRICULUM VITAE

AND LIST OF PUBLICATIONS

• Personal Details

Name:	**Meir Kalech**
Date of birth:	December 16, 1970, Israel
Regular military service:	1989-1994
Affiliation:	Department of Information Systems Engineering, Ben-Gurion University, Israel
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• Education

B.A.	1992-1995	1. Jewish Philosophy, Bar Ilan University, Israel. 2. Teaching Diploma from the Teachers Seminar in Alon Shevut, Israel.
B.Sc.	1995-1996	Computers Science, Bar Ilan University, Israel.
M.A.	1997-2000	General Philosophy (cum Laude) Bar Ilan University, Israel. Supervised by Prof. Dani Statman Topic: " Leibowich: between Cognitive and Conative "
Ph.D.	2002-2006	Department of Computer Science in Bar-Ilan University, Israel. Advisor: Dr. Gal A. Kaminka. Topic: "Model-Based Diagnosis of Multi-Agent Systems"

• Employment History

2/2019-date	Associate Professor in the Department of Information System Engineering, Ben Gurion University of the Negev, Beer Sheva, Israel.
2/2014-1/2019	Senior Lecturer in the Department of Information System Engineering, Ben Gurion University of the Negev, Beer Sheva, Israel.

10/2008-1/2014	Lecturer in the Department of Information System Engineering, Ben Gurion University of the Negev, Beer Sheva, Israel.
09/2007-09/2008	Postdoctoral position at Harvard University in the laboratory of Prof. Barbara Grosz and Prof. Avi Pfeffer investigated decision making under uncertainty. I was a participant in the Colored Trails project, a general test bed for investigating human-computer decision-making
07/2006-08/2007	Postdoctoral position in Bar-Ilan University in the laboratory of Prof. Gal Kaminka and Prof. Sarit Kraus. I develop distributed technologies for mobile phones in a joint project with Samsung Telecommunications. Supervised two students.
2002-2006	Ph.D. research in Computer Science in Bar-Ilan University, Israel. My research focused on applied diagnosis to distributed tightly-coupled systems and robots. I combine techniques from several areas in artificial intelligence: Model-Based Diagnosis, Multi-Agent Systems, Distributed Constraints Satisfaction and Robotics.
1997-1998	Software engineer in Motorola Israel, Engineering Cellular Department, in Cellular Network Management project.

• Professional Activities

(a) Positions in academic administration (departmental, faculty and university)

8/2020-date	Vice Chair of the Department of Software and Information Systems, Ben Gurion University of the Negev, Beer Sheva.
2016-2020	Cahir of the undergraduate studies committee of the Department of Software and Information Systems, Ben Gurion University of the Negev, Beer Sheva.
2009 – 2015	Member of the undergraduate studies committee of the Department of Information Systems, Ben Gurion University of the Negev, Beer Sheva.

(b) Professional functions outside universities (inter-university, national, international)

Editorial Board Member	1. Diagnostics journal IF-20 3.706, (51/3013) Q1
Area Chair in refereed conferences	1. The 31nd International Joint Conference on Artificial Intelligence, Virtual, 2021
Workshops Chair in refereed conferences	1. The 22nd European Conference on Artificial Intelligence, Hague, 2016

Senior Program Committee member in refereed conferences

1. The 32nd International Joint Conference on Artificial Intelligence, Vienna 2022
2. The Thirty-Sixth International Conference of the American Association for Artificial Intelligence, Vancouver 2022
3. The Thirty-Fifth International Conference of the American Association for Artificial Intelligence, Virtual 2021
4. The Thirty-Fourth International Conference of the American Association for Artificial Intelligence, New York 2020
5. The 29th International Joint Conference on Artificial Intelligence, Yokohama 2020
6. The 28th International Joint Conference on Artificial Intelligence, Macao 2019
7. The 27th International Joint Conference on Artificial Intelligence, Stockholm 2018
8. The Thirty-Second International Conference of the American Association for Artificial Intelligence, New Orleans 2018
9. The Thirty-First International Conference of the American Association for Artificial Intelligence, San-Francisco 2017
10. The Thirty International Conference of the American Association for Artificial Intelligence, Phoenix 2016
11. The Twenty-Ninth International Conference of the American Association for Artificial Intelligence, Austin 2015

Program Committee member in refereed conferences

1. The Twenty-Eight International Conference of the American Association for Artificial Intelligence, Bellevue 2014
2. The Twenty-Sixth International Conference of the American Association for Artificial Intelligence, San-Francisco 2012
3. The Ninth International Conference on Autonomous Agents and multi-Agent Systems, Toronto 2010
4. The Twenty-First International Joint Conference on Artificial Intelligence, Pasadena 2009
5. The Seventh International Conference on Autonomous Agents and Multi-Agent Systems, Portugal 2008
6. The Twenty-Third International Conference of the American Association for Artificial Intelligence, Chicago 2008
7. The Twenty-First International Conference of the American Association for Artificial Intelligence, Boston 2006
8. The Twenty International Conference of the American Association for Artificial Intelligence, Pittsburgh 2005

1. The Thirty Third International Workshop on Principles of Diagnosis, Toulouse, 2022
2. The Thirty Second International Workshop on Principles of Diagnosis, Hamburg, 2021

	3. The Thirty First International Workshop on Principles of Diagnosis, Online, 2020
	4. The Thirty International Workshop on Principles of Diagnosis, Klagenfurt, 2019
	5. The Twenty Nine International Workshop on Principles of Diagnosis, Warsaw 2018
Program Committee member in workshops	6. The Twenty Eight International Workshop on Principles of Diagnosis, Brescia 2017
	7. The Twenty Seventh International Workshop on Principles of Diagnosis, Denver 2016
	8. The Twenty Sixth International Workshop on Principles of Diagnosis, Paris 2015
	9. The Twenty Fifth International Workshop on Principles of Diagnosis, Graz 2014
	10. The Twenty Third International Workshop on Principles of Diagnosis, Great Malvern 2012
	11. The Twenty Second International Workshop on Principles of Diagnosis, Murnau 2011
	12. The Twenty First International Workshop on Principles of Diagnosis, Portland 2010
	13. The first workshop of Modeling Other Agents from Observations, New-York 2004
Workshop Chair	I organized the 24th International Workshop on Principles of Diagnosis in Jerusalem in October 1-4, 2013

(c) Journal reviewing

1. Artificial Intelligence Journal (AIJ)
2. Journal of Artificial Intelligence Research (JAIR)
3. Journal f Autonomous Agents and Multi Agent Systems (JAMMAS)
4. Transactions on Systems, Man and Cybernetics
5. IEEE Transactions on Robotics
6. Annals of Mathematics and Artificial Intelligence
7. AI Communications
8. Expert Systems With Applications
9. Engineering Applications of Artificial Intelligence
10. Robotics and Autonomous Systems
11. Software & Systems Modeling
12. Journal of Intelligent Information Systems
13. Computing Surveys
14. Applied Soft Computing
15. Software Quality Journal
16. Diagnostics

17. IEEE Transactions on Reliability
18. Journal of The Franklin Institute

• Educational activities

(a) Courses taught

(**BGU** - Ben-Gurion University of the Negev, Beer Sheva, Israel;
BIU - Bar-Ilan University, Israel;
Ariel – Ariel College, Israel)

Introduction to Programming	BIU, Ariel	Undergraduate
Object Oriented Programming	BIU, Ariel	Undergraduate
Advanced Programming	BGU	Undergraduate
Data Structures	Ariel	Undergraduate
Files Organization and Processing	BGU	Undergraduate
Model-Based Diagnosis	BGU	MA
Algorithms	BGU	Undergraduate

(b) Research students (current)

Ph.D.

2020-date	Ido Tam, Ph.D. topic: Hybrid models for time series classification
2020-date	Inbal Roshanski, Ph.D. topic: Feature Engineering
2019- date	Bruno Machado, Ph.D, topic: Using Big Code to Predict Vulnerabilities in Software
2021- date	Avi Natan, topic: Diagnosis for Multi-Agent Systems

Ms.C.

2021-date	Shaked Almog, topic: Diagnosis of Decision Trees
2020-date	Saleem Ghantous, topic: Thickness Prediction AI-Based Module
2020-date	Matan Hazan, topic Modeling for AutoDebugging
2020-date	Shir Cohen, topic: Predicting Bugs with GAN
2022-date	Tom Mashiah, topic: Does Robotics software differ than other AI software?

(c) Research students (Alumni)

Ph.D.

2009 – 2014	Lihi Naamani, (Ph.D. adjunct advisor), topic: Voting with reduced votes (advising jointly with Lior Rokach and Bracha Shapira)
2009 – 2012	Roni Stern, (Ph.D. adjunct advisor), topic: Search in unknown graphs

(advising jointly with Ariel Felner)

2011 – 2016 Eliahu Khalastchi, Ph.D, topic: Autonomous Anomaly Detection and Diagnosis (advising jointly with Lior Rokach)

2016 – 2021 Amir Elmishali, Ph.D. topic: Diagnosing System Exploits (advising jointly with Roni Stern)

M.Sc.

2009 – 2011 Eli Maman, M.Sc., topic: Decision making with dynamic information

2010 – 2012 Ayelet Urieli, M.Sc., topic: Survival Analysis in Large-Scale Systems

(advising jointly with Lior Rokach)

2012 – 2014 Yedidya Bar-Zeev, M.Sc, topic: Diagnosing Broken Synchronization in Multi-Agent Systems (advising jointly with Roni Stern)

2013 – 2015 Tzah Tsabag, M.Sc, topic: Anomaly Detection in SCADA using Modbus

2013 – 2016 Tom Zamir, M.Sc, topic: AI techniques for automatic debugging

2013 – 2015 Shelly Rogov, M.Sc. topic: Methods to evaluate the results of model-based diagnosis algorithms

2014 – 2016 Orel Elimelech, M.Sc. topic: Model-Based Diagnosis with Boolean Satisfaction (advising jointly with Roni Stern)

2014 - 2017 David Biton, M.Sc. topic: User and Group Profiling For Anomaly Detection (advising jointly with Lior Rokach)

2014 – 2016 Amir Elmishali, M.Sc. topic: Machine Learning Techniques for Software Faults Prediction (advising jointly with Roni Stern)

2015 – 2017 Hilla Shinitski, MSc, topic: Repair Planning with Batch Repair (advising jointly with Roni Stern)

2015 – 2017 Netanel Hasidi, MSc, topic: Anticipatory Troubleshooting (advising jointly with Roni Stern)

2015 –2018 Amit Shlomo, MSc, topic: Attacks detection in SCADA systems

2016 – 2018 Ori Bar-Ilan, MSc, topic: Approximate Model Based Diagnosis via Invariant Synthesis (advising jointly with Roni Stern)

2016 – 2018 Lior Chen, MSc, topic: Cybox modeling for coverage (advising jointly with Roni Stern)

2017- 2019 Ido Tam, MSc, topic: Fault Detection and Diagnosis of Bearings

2018-2020 Dean Cazes, topic: Automating Bug Repair

2018-2020 Gal Rozenfeld, MSc., topic: A Machine Learning Approach for Circuit Synthesis

2018-2020 Yotam Shichel, MSc., topic: Automatic Rephrasing (advising jointly with Oren Zur)

2018-2020 Inbal Roshanski, topic: Cross Project Bug Prediction

2019-2021 Avi Natan, topic: Distributed Diagnosis for Multi-Agent Plan

2019-2021 Ariel Gorenstein, topic: Fault Prediction in Water Mains

• Awards, Honors

(a) Honors, Awards (including during studies)

2000	Excellence in M.A studies (including Thesis) in General Philosophy, Bar-Ilan University – Israel.	
2003	Rector List in Ph.D. studies in Computer Science department, Bar-Ilan University – Israel	$1000
2005	The Schuff Scholarship for excellent and community involvement (competitive award).	$10000
2011	Best project award of the Israeli Testing Certification Board (ITCB)	5000 NIS
2014	IBM PhD Fellowship Program (for Eli Khalaschi)	$20000
2022	AAAI Senior Member	

• Scientific Publications

Google scholar h-index=24 (1495 citations)

ISI h-index=11 (437 citations / 357 without self-citations)

Thesis and Books

1. **Kalech, M**. *Leibowich: between Cognitive and Conative*, master thesis in Philosophy department, Bar-Ilan 2000 (in Hebrew)
2. **Kalech, M**. *Data Structures*, Opus Press, Tel-Aviv 2002 (in Hebrew)
3. **Kalech, M.** Diagnosing Coordination Faults in Multi-Agent Systems, Ph.D. thesis in Computer Science, Bar-Ilan University, Israel, 2006

Edited Volumes:

1. ***Kalech, M**. Rui Abreu, Mark Last, Artificial Intelligence Methods for Software Engineering, *World Scientific*, 2021

Journal Papers:

1. **Kalech[S], M**. Kaminka[PI], On the Design of Coordination Diagnosis Algorithms for Teams of Situated Agents, *Artificial Intelligence Journal*, 71, 2007 pp. 491-513 citations: ISI-32, GS-55, impact factor of AIJ-07 is: 3.008, 6/93, Q1
2. Michael Lindner[S], **Meir Kalech[PI]**, Gal A. Kaminka[PI], A Representation for Coordination Fault Detection in Large-Scale Multi-Agent Systems, *Annals of*

*Mathematics and Artificial Intelligence, 5*6, 2, pp. 153-186, 2009
citations: ISI-2, GS-5, AMAI-09 is: 0.893, 78/103, Q4

3. Lior Rokach[PI], **Meir Kalech**[PI], Ido Blank[S], Rami Stern[T], Who is Going to Win the Next AAAI Fellowship Award? Evaluating Researchers by Mining Bibliographic Data, *Journal of the American Society for Information Science and Technology (JASIST)*, volume 62, issue 12, pp. 2456-2470, 2011
citations: ISI-10, GS-24, impact factor of JASIST-11 is: 2.081, 21/135, Q1

4. **Meir Kalech**[PI], Sarit Kraus[PI], Gal A. Kaminka[PI], Claudia V. Goldman[C], Practical voting rules with partial information, *Journal of Autonomous Agents and Multi-Agent System*, 22:151–182, 2011
citations: ISI-27, GS-71, impact factor of JAAMAS-10 is: 2.103, 8/60, Q1

5. **Meir Kalech**[PI], Gal A Kaminka[PI], Coordination Diagnostic Algorithms for Teams of Situated Agents: Scaling-Up, *Computational Intelligence*, volume 27 issue 3, pp. 393-421, 2011
citations: ISI-8, GS-17, 5-years impact factor of CI-11 is: 0.971, 69/111, Q3

6. Roni Stern[S], **Meir Kalech**[PI], Ariel Felner[PI], Finding Patterns in an Unknown Graph, *AI-Communications*, 25(3): 229-256, 2012
citations: ISI-4, GS-9, 5-years impact factor of *AIC*-12 is: 0.449, 100/115, Q4

7. **Meir Kalech**[PI], Diagnosis of Coordination Faults: A Matrix-Based Approach, *Journal of Autonomous Agents and Multi-Agent System*, Volume 24, Issue 1, pp. 69-103, 2012
citations: ISI-15, GS-24, 5-years impact factor of JAAMAS-12 is: 0.79, 37/59, Q3

8. Ayelet Eyal[S], Lior Rokach[PI], **Meir Kalech**[PI], Ofra Amir[PD], Rahul Chougule[C], Rajkumar Vaidyanathan[C], and Kallappa Pattada[C], Survival Analysis of Automobile Components using Mutually Exclusive Forests, *Transactions: IEEE Transactions on Systems Man and Cybernetics: Systems*, 44(2): 246-253, 2013
citations: ISI-3, GS-11, impact factor of *Transactions on Systems, Man, and Cybernetics--Part A: Systems and Humans*-12 is: 2.169, 8/100, Q1 (this is the name of the journal until 2012)

9. Shulamit Reches[S], **Meir Kalech**[PI], Philip Hendrix[S], A Framework for Effectively Choosing between Alternative Candidate Partners, *ACM Transactions on Intelligent Systems and Technology*, 5(2), pp. 1-28, 2014
citations: ISI-1, GS-2, impact factor of *TIST-13* is: 9.39, 1/135, Q1

10. Shulamit Reches[S], **Meir Kalech**[PI], Choosing a Candidate Using Efficient Allocation of Biased Information, *ACM Transactions on Intelligent Systems and Technology*, 5(4), pp. 1-30, 2014
citations: ISI-0, GS-1, impact factor of *TIST-13* is: 9.39, 1/135, Q1

11. Roni Stern[PI], **Meir Kalech**[PI], Model-Based Diagnosis Techniques for Internet Delay Diagnosis with Dynamic Routing, *Applied Intelligence*, 41(1), pp. 167-183,

2014
citations: ISI-4, GS-6, impact factor of *Applied Intelligence-12* is: 1.853, 32/115, Q2 (no IF for 2013, 2014)

12. Lihi Naamani Dery[S], **Meir Kalech[PI]**, Lior Rokach[PI], Bracha Shapira[PI], Reaching a Joint Decision with Minimal Elicitation of Voter Preferences, *Information Sciences*, 278: pp. 466-487,2014
citations: ISI-19, GS-27, impact factor of Information Sciences-14 is: 4.038, 6/139, Q1

13. Amit Metodi[S], Roni Stern[PI], **Meir Kalech[PI]**, Michael Codish[PI], A Novel SAT-based approach to Model Based Diagnosis, *Journal of Artificial Intelligence Research*, 51: pp. 377-411, 2014
citations: ISI-35, GS-63, impact factor of JAIR-14 is: 1.247, 66/123, Q3

14. Lihi Naamani Dery[S], Inon Golan[S], Meir Kalech[PI], Lior Rokach[PI], Preference Elicitation for Group Decisions Using the Borda Voting Rule, *Group Decision and Negotiation*, pp.1-19, 2015
citations: ISI-9, GS-17, impact factor of Group Decision and Negotiation-14 is: 2.12, 8/95, Q1

15. Eliahu Khalastchi[S], **Meir Kalech[PI]**, Gal A. Kaminka[PI], Raz Lin[C], Online Data Driven Anomaly Detection in Autonomous Robots, *Knowledge and Information Systems*,43(3), pp. 657-688, 2015
citations: ISI-38, GS-72, impact factor of *KAIS-15* is: 1.702, 41/144, Q2

16. Eli Rohn[PI], **Meir Kalech[PI]**, Abraham Diskin[PI], Coalition Formation Decision Support System, *Social Science Computer Review*, 2015
citations: ISI-3, GS-5, impact factor of Social Science Computer Review-15 is: 1.525, 51/104, Q2

17. **Meir Kalech[PI]**, Shulamit Reches[S]: Decision Making with Dynamic Uncertain Events. *J. Artif. Intell. Res. (JAIR)* 54: 233-275, 2015
citations: ISI-2, GS-2, impact factor of JAIR-15 is: 2.536, 55/130, Q2

18. Lihi Naamani-Dery[s], **Meir Kalech[PI]**, Lior Rokach[PI], Bracha Shapira[PI], Reducing Preference Elicitation in Group Decision Making, *Expert Systems with Applications Journal*, Volume 61 Issue C, pp. 246-261, 2016
citations: ISI-9, GS-16, impact factor of *Expert Systems with Applications Journal* -16 is: 3.928, 18/133, Q1

19. Ofrit Lesser[S], Lihi Naamani-Dery[S], **Meir Kalech[PI]**, Yuval Elovici[PI], Group Decision Support for Leisure Activities Using Voting and Social Networks, *Group Decision and Negotiation*, pp 1-22, 2016
citations: ISI-12, GS-15, impact factor of Group Decision and Negotiation-16 is: 1.688, 16/96, Q1

20. Roni Stern[PI], **Meir Kalech[PI]**, Orel Elimelech[s], Yedidya Bar-Zeev[s], Diagnosing Resource Usage Failures in Multi-Agent Systems, *Expert Systems With*

Applications, Volume 77, pp. 44-56, 2017
citations: ISI-7, GS-11, impact factor of *Expert Systems with Applications Journal* -17 is: 3.76, 42/260, Q1

21. Roni Stern[PI], **Meir Kalech[PI]**, Shelly Rogov[s], Alexander Feldman[c], How Many Diagnoses Do We Need?, *Artificial Intelligence Journal*, 248, pp. 26-45, 2017
citations: ISI-10, GS-28, impact factor of AIJ -17 is: 3.034, 28/132, Q1

22. Eliahu Khalastchi[S], **Meir Kalech[PI]**, Lior Rokach[PI], A Hybrid Approach for Improving Unsupervised Fault Detection for Robotic Systems, *Expert Systems With Applications*, 81, 372-383, 2017
citations: ISI-12, GS-16, impact factor of *Expert Systems with Applications Journal*-17 is: 3.768, 20/123, Q1

23. Eliahu Khalastchi[S], **Meir Kalech[PI]**, On Fault Detection and Diagnosis in Robotic Systems, *ACM Computing Survey*, 51(1), 9, 2018
citations: ISI-42, GS-81, impact factor of ACM Computing Survey -18 is: 6.131, 6/105, Q1

24. Amir Elmishali[S], Roni Stern[PI], **Meir Kalech[PI]**, An Artificial Intelligence Paradigm for Troubleshooting Software Bugs, *Engineering Applications of Artificial Intelligence*, 69, pp. 147-156, 2018
citations: ISI-16, GS-27, impact factor of Engineering Applications of Artificial Intelligence-18 is: 3.526, 15/88, Q1

25. Eliahu Khalastchi[S], **Meir Kalech[PI]**, A Sensor-Based Approach for Fault Detection and Diagnosis for Robotic Systems, *Autonomous Robots*, 2018
citations: ISI-8, GS-22, impact factor of Autonomous Robots-18 is: 3.634, 33/134, Q1

26. David Biton[S], **Meir Kalech[PI]**, Lior Rokach[PI], FSCOAL- Parallel Simultaneous Fuzzy Co-Clustering and Learning, *International Journal of Intelligent Systems*, 2018
citations: ISI-0, GS-0, impact factor of International Journal of Intelligent Systems -18 is: 7.729, 8/134, Q1

27. Reuth Mirsky[S], Roni Stern[PI], Ya'akov (Kobi) Gal[PI], **Meir Kalech[PI]**, Sequential plan recognition: An iterative approach to disambiguating between hypotheses, *Artificial Intelligence Journal*, 2018
citations: ISI-6, GS-24, impact factor of AIJ -18 is: 4.483, 22/134, Q1

28. *Reuth Mirsky[S], Ya'akov (Kobi) Gal[PI], Roni Stern[PI], **Meir Kalech[PI]**, Goal and Plan Recognition Design for Plan Libraries, *Transactions on Intelligent Systems and Technology*, 10(2), 14:1-14:23, 2019
citations: ISI-5, GS-18, impact factor of *Transactions on Intelligent Systems and Technology*-19: 2.672, 58/137, Q2

29. *__Meir Kalech[PI]__, Cyber-Attack Detection in SCADA Systems using Temporal Pattern Recognition Techniques, *Computers & Security*, 84, 225-238, 2019
citations: ISI-20, GS-45, impact factor of Computers & Security-19 is: 3.579, 42/156, Q2

30. *Eliahu Khalastchi[S], **Meir Kalech[PI]**, Fault Detection and Diagnosis in Multi-Robot Systems: A Survey, *Sensors* 19(18), 2019
citations: ISI-9, GS-24, impact factor of Sensors-19 is 3.275, 15/64, Q1

31. *Lihi Dery[PI], Svetlana Obraztsova[PI], Zinovi Rabinovich[PI], Meir **Kalech[PI]**, Lie on the Fly: Strategic Voting in an Iterative Preference Elicitation Process, *Group Decision and Negotiation* 28: 1077, pp. 1-31, 2019
citations: ISI-3, GS-4, impact factor of Group Decision and Negotiation-19 is: 2.01, 31/109, Q2

32. *Amir Elmishali[S], Roni Stern[PI] and **Meir Kalech[PI]**, "Diagnosing Software System Exploits" in IEEE Intelligent Systems, 2020
citations: ISI-0, GS-0, impact factor of *IEEE Intelligent Systems* -20 is: 3.405, 53/140, Q2

33. *Ido Tam[S], **Meir Kalech[PI]**, Lior Rokach[PI], Eyal Madar[S], Jacob Bortman[PI], Renata Klein[PI], Probability-Based Algorithm for Bearing Diagnosis with Untrained Spall Sizes. *Sensors* 20(5): 1298, 2020
citations: ISI-0, GS-1, impact factor of Sensors-20 is 3.576, 14/64, Q1

34. *R Mirsky[S], S Hibah[S], M Hadad[S], A Gorenstein[S], **M Kalech[PI]**, "PhysIt"-A Diagnosis and Troubleshooting Tool for Physiotherapists in Training, *Diagnostics* 10 (2), 72, 2020
impact factor of Diagnostics-20 is 3.706, 51/313, Q1

35. ***Kalech, M[PI]**, Koppel[PI], M., Diskin[PI], A., Rohn, E[PI]. and Roshanski, I[S]., Formation of Parties and Coalitions in Multiple Referendums. *Group Decision and Negotiation*, pp.1-23, 2020
citations: ISI-1, GS-1, impact factor of Group Decision and Negotiation-20 is: 2.648, 31/110, Q2

36. *Reches, S[PI]. and **Kalech, M[PI]**., Decision Making with Dynamic Uncertain Continuous Information. *Expert Systems with Applications*, 113586, 2020
citations: ISI-0, GS-1, impact factor of Expert Systems with Applications Journal-20 is: 6.954, 24/273, Q1

37. *Gorenstein, A.[S], **Kalech, M.[PI]**, Hanusch, D.F.[PI], Hassid, S[C]. Pipe Fault Prediction for Water Transmission Mains, 12, 2861 *Water* 2020
citations: ISI-0, GS-1, impact factor of Water-20 is 3.103, 39/98, Q2

38. *Amit Shlomo[S], **Meir Kalech[PI]**, Robert Moskovitch[PI], Temporal pattern-based malicious activity detection in SCADA systems, *Computers & Security*, Volume 102, 2021
citations: ISI-5, GS-7, impact factor of Computers & Security-20 is: 4.438, 40/162, Q1

39. *Netanel Hasidi[S], **Meir Kalech[PI]**, Anticipatory Troubleshooting, *Applied Sciences*, 11(3), 2021
citations: ISI-0, GS-0, citations: ISI-3, GS-5, impact factor of Applied Sciences-20 is: 2.679, 38/91, Q2

40. *Dean Cazes[S], **Meir Kalech[PI]**, Model-based diagnosis with uncertain observations, *International Journal of Intelligent Systems*, Vol. 36, Issue 7, 2021 citations: ISI-N/A, GS-1, impact factor of International Journal of Intelligent Systems -20 is: 8.709, 12/140, Q1

41. ***Meir Kalech[PI]**, Roni Stern[PI], Ester Lazebnik[S], Minimal Cardinality Diagnosis in Problems with Multiple Observations. *Diagnostics*, 11(5):780, 2021
citations: ISI-1, GS-4, impact factor of Diagnostics-20 is 3.706, 51/313, Q1

42. *Rozenfeld Gal[S], **Meir Kalech[PI]**, Lior Rokach[PI], Active-learning-based reconstruction of circuit model, *Applied Intelligence*, 2021
citations: ISI-0, GS-0, impact factor of *Applied Intelligence*-20 is 5.086, 35/139, Q2

43. ***Meir Kalech[PI]**, Decision-Making under Group Commitment." *Mathematics* 9(17), 2080, 2021
citations: ISI-0, GS-0, impact factor of *Mathematics*-20 is 2.258, 24/330, Q1

44. *Bruno Sotto-Mayor[S], **Meir Kalech[PI]**, Cross-project smell-based defect prediction, *Soft Computing*, 25, pp. 14171–14181, 2021
citations: ISI-1, GS-1, impact factor of *Soft Computing*-20 is 3.643, 49/139, Q2

45. *Avraham Natan [S], **Meir Kalech[PI]**, Privacy-aware Distributed Diagnosis of Multi-Agent Plans, *Expert Systems with Applications* 192, 2022
citations: ISI-0, GS-0, impact factor of Expert Systems with Applications Journal-20 is: 6.954, 24/273, Q1

Refereed Conference Papers

1. **Kalech, M[S]**. Kaminka[PI], A. G. On the Design of Social Diagnosis Algorithms for Multi-Agent Teams, *the Seventeenth International Joint Conference on Artificial Intelligence (IJCAI-03),* Acapulco 2003 (Acceptance rate: 20.7%) (A*)
2. Gal A. Kaminka[PI], Yehuda Elmaliach[S], Inna Frenkel[S], Ruti Glick[S], **Meir Kalech[S]**, Tom Shpigelman[S], Towards a Comprehensive Framework for Teamwork in Behavior-Based Robots, *Conference on Intelligence Autonomous System 8,* Amsterdam 2003 (C)
3. **Kalech, M[S]**. Kaminka[PI], A. G.**,** Diagnosing a Team of Agents: Scaling-Up, *the Fourth International Joint Conference on Autonomous Agents and Multiagent Systems (AAMAS-05),* Holland 2005. (Acceptance rate: 24.5%). (A*)
4. **Kalech, M[S]**. Kaminka[PI], A. G.**,** Towards Model-Based Diagnosis of Coordination Failures**,** *the Twenty National Conference on Artificial Intelligence (AAAI-05),* Pittsburgh 2005. (Acceptance rate: 18.4%). (A*)
5. **Kalech, M[S]**., Kaminka[PI], A. G. Meisels[PI], A. Elmaliah[S], Y.**,** Diagnosis of Multi-Robot Coordination Failures Using Distributed CSP Algorithms, *The Twenty-First National Conference on Artificial Intelligence (AAAI-06),* Boston 2006. (Acceptance rate: 21%). (A*)

6. **Kalech[S], M**. Lindner[S] M. Kaminka[PI] G. A., "Matrix-Based Representation for Coordination Fault Detection: A Formal Approach", *Autonomous Agents and Multi-Agent System (AAMAS)*, Hawaii 2007 (Acceptance rate: 22.8%). (A*)
7. Lihi Naamani Dery[S], **Meir Kalech[PI]**, Lior Rokach[PI], Bracha Shapira[PI], Iterative Voting under Uncertainty for Group Recommender Systems, in *ACM Recommender Systems*, Barcelona 2010 (Acceptance rate: 42.3%) (B)
8. **Meir Kalech[PI]**, Avi Pfeffer[PI], Decision Making with Dynamically Arriving Information, *the Ninth International Joint Conference on Autonomous Agents and Multiagent Systems (AAMAS-10)*, Toronto 2010 (Acceptance rate: 23.7%) (A*)
9. Asaf Shiloni[S], Alon Levy[S], Ariel Felner[PI] and **Meir Kalech[PI]**, Ants Meeting Algorithms, *the Ninth International Joint Conference on Autonomous Agents and Multiagent Systems (AAMAS-10)*, Toronto 2010 (in press). (A*)
10. **Meir Kalech[PI]**, Shulamit Reches[S], Rami Stern, When to Stop? That is the Question, in *The Twenty-Fifth National Conference on Artificial Intelligence (AAAI-11)*, San-Francisco, 2011 (acceptance rate: 24.8%) (A*)
11. Eliahu Khalastchi[S], **Meir Kalech[PI]**, Gal A. Kaminka[PI] and Raz Lin[S], Online Anomaly Detection in Unmanned Vehicles, in *the Tenth International Joint Conference on Autonomous Agents and Multiagent Systems (AAMAS-11)*, Taiwan 2011 (Acceptance rate: 22%) (A*)
12. Amit Metodi[S], Roni Stern[S], **Meir Kalech[PI]** and Michael Codish[PI], Compiling Model-Based Diagnosis to Boolean Satisfaction, in *The Twenty-Sixth National Conference on Artificial Intelligence (AAAI-12)*, Toronto, 2012 (Acceptance rate: 26%) (A*)
13. Roni Stern[S], **Meir Kalech[PI]**, Alexander Feldman[PI], Gregory Provan[PI], Exploring the Duality in Conflict-Directed Model-Based Diagnosis, in *The Twenty-Sixth National Conference on Artificial Intelligence (AAAI-12)*, Toronto, 2012 (Acceptance rate: 26%) (A*)
14. Lior Rokach[PI], **Meir Kalech[PI]**, Gregory Provan[PI], Alexander Feldman[PI], Machine-Learning-Based Circuit Synthesis, *the Twenty-third International Joint Conference on Artificial Intelligence (IJCAI-13)*, Beijing 2013 (Acceptance rate: 28%) (A*)
15. Eliahu Khalastchi[S], **Meir Kalech[PI]**, Lior Rokach[PI], Sensor fault detection and diagnosis for autonomous systems, in *the Twelve International Joint Conference on Autonomous Agents and Multiagent Systems (AAMAS-13)*, 2013 (Acceptance rate: 22%) (A*)
16. Eliahu Khalastchi[S], **Meir Kalech[PI]**, Lior Rokach[PI], A Hybrid Approach for Fault Detection in Autonomous Physical Agents, *the 13th International Joint Conference on Autonomous Agents and Multiagent Systems (AAMAS-14)*, 2014 (Acceptance rate: 23%) (A*)
17. Tom Zamir[S], Roni Stern[PI], **Meir Kalech[PI]**: Using Model-Based Diagnosis to Improve Software Testing. , in *The Twenty-Eighth National Conference on Artificial Intelligence (AAAI-14)*, 2014: 1135-1141 (Acceptance rate: 28%) (A*)
18. Lihi Naamani Dery[S], **Meir Kalech[PI]**, Lior Rokach[PI], Bracha Shapira[PI], Preference Elicitation for Narrowing the Recommended List for Groups, in *ACM*

Recommender Systems, Foster City, Silicon Valley 2014 (Acceptance rate: 24%) (B)

19. Roni Stern[PI], **Meir Kalech[PI]**, Alexander Feldman[PI], Shelly Rogov[PI], Tom Zamir[PI], How Many Diagnoses Do we Need?, in *The Twenty-Ninth National Conference on Artificial Intelligence (AAAI-15)*, 2015 (Acceptance rate: 26%) (A*)
20. Lihi Naamani-Dery[PI], Zinovi Rabinovitch[PI], Svetlana Obraztsova[PI], **Meir Kalech[PI]**, Lie on the Fly: Iterative Voting Center with Manipulative Voters, in *the Twenty-fourth International Joint Conference on Artificial Intelligence (IJCAI-15)*, 2015 (Acceptance rate: 28%) (A*)
21. Roni Tzvi Stern[PI], **Meir Kalech[PI]**, Hilla Shinitzky[S], Implementing Troubleshooting with Batch Repair, in *The Thirty National Conference on Artificial Intelligence (AAAI-16)*, 2016 (Acceptance rate: 26%) (A*)
22. Amir Elmishali[S], Roni Stern[PI], **Meir Kalech[PI]**, Data-Augmented Software Diagnosis, in *the Twenty-Eighth Annual Conference on Innovative Applications of Artificial Intelligence (AAAI-16)*, 2016 (Acceptance rate: 26%) (A*)
23. Reuth Mirsky, Roni Stern[PI], Ya'akov (Kobi) Gal[PI], **Meir Kalech[PI]**, Sequential Plan Recognition. , in *the Twenty-fifth International Joint Conference on Artificial Intelligence (IJCAI-16)*, 2016 pp. 401-407 (Acceptance rate: 26%) (A*)
24. Netantel Hasidi[PI], Roni Stern[PI], **Meir Kalech[PI]**, Shulamit Reches[PI], Anticipatory Troubleshooting. in *the Twenty-fifth International Joint Conference on Artificial Intelligence (IJCAI-16)*, 2016, pp. 3133-3139 (Acceptance rate: 26%) (A*)
25. *Amir Elmishali[S], Roni Stern[PI], **Meir Kalech[PI]**, DeBGUer: A Tool for Bug Prediction and Diagnosis, in *the Thirty-First Annual Conference on Innovative Applications of Artificial Intelligence (AAAI-19)*, 2019 (Acceptance rate: 16.2%) (A*)
26. ***Meir Kalech[PI]**, Roni Stern[PI], AI for Software Quality Assurance, in *the Thirty-Four Annual Conference on Innovative Applications of Artificial Intelligence National Conference on Artificial Intelligence (AAAI-20)*, 2020 (Acceptance rate: 20.6%) (A*)
27. *Dean Cazes[S], **Meir Kalech[PI]**, Model-Based Diagnosis with Uncertain Observations, in *the Thirty-Four Annual Conference on Innovative Applications of Artificial Intelligence National Conference on Artificial Intelligence (AAAI-20)*, 2020 (Acceptance rate: 20.6%) (A*)
28. *Yotam Shichel[S], **Meir Kalech[PI]**, Oren Tsur[PI], With Measured Words: Simple Sentence Selection for Black-Box Optimization of Sentence Compression Algorithms, *Proceedings of the 16th Conference of the European Chapter of the Association for Computational Linguistics: Main Volume (EACL-21)*, pp. 1625-1634, 2021 (A)

29. *Amir Elmishali[S], Bruno Sotto-Mayor[S], Inbal Roshanski[S], Amit Sultan[S], **Meir Kalech[PI]**, BEIRUT: Repository Mining for Bug Prediction, *The 32nd International Symposium on Software Reliability Engineering (ISSRE 2021)*, 2021 (A)
30. ***Meir Kalech[PI]**, Avraham Natan[S], Model-Based Diagnosis of Multi-Agent Systems: A Survey, *AAAI-22*, 2022 (A*)

Workshop and Symposium papers:

1. **Kalech, M**. Kaminka, A. G., Modelling multi-agent systems as constraints for model-based diagnosis, in the Workshop on Modeling and Solving Problems with Constraints, the Sixteen International Joint Conference on Artificial Intelligence (IJCAI-05), 2005
2. Roie Zivan, Uri Shapen, Amnon Meisels, and **Meir Kalech**. Hybrid Search for Dynamically Changing CSPs, Annual ERCIM Workshop on Constraint Solving and Constraint Logic Programming (CSCLP 2008), 2008
3. **Kalech, M**. Lindner, M. Kaminka, A. G., Diagnosis of Coordination Faults: A Matrix-Based Formulation, in the Nineteen International Workshop on Principles of Diagnosis (DX-08), 2008
4. Vladimir Sadov, Eliahu Khalastchi, **Meir Kalech**, Gal Kaminka, Towards Partial (and Useful) Model Identification for Model-Based Diagnosis, in the Twenty First International Workshop on Principles of Diagnosis (DX-10), 2010
5. Roni Stern, **Meir Kalech**, MBD Techniques for Internet Delay Diagnosis, in the Twenty First International Workshop on Principles of Diagnosis (DX-10), 2010
6. Roni Stern, **Meir Kalech** and Ariel Felner, Searching for a k-Clique in Unknown Graphs, in Symposium on Combinatorial Search, 2010
7. Betty Keren, **Meir Kalech**, Lior Rokach, Model-Based Diagnosis with Multi-Label Classification, in the *Twenty Second International Workshop on Principles of Diagnosis (DX-11)*, Murnau 2011
8. Roni Stern, **Meir Kalech**, Stas Osipov, Natan Semyonov, MBD Techniques for Internet Delay Diagnosis with Dynamic Routing, in the *Twenty Third International Workshop on Principles of Diagnosis (DX-12)*, UK, 2012
9. Roni Stern, **Meir Kalech**, Niv Gafni, Yair Ofir, Eliav Ben-Zaken, Using Model-Based Diagnosis to Improve Software Testing, in the *Twenty Third International Workshop on Principles of Diagnosis (DX-12)*, UK, 2012
10. Eliahu Khalastchi, **Meir Kalech** ,Lior Rokach, Yotam Shicel and Gali Bodek, Sensor fault detection and diagnosis for autonomous systems, in the *Twenty Third International Workshop on Principles of Diagnosis (DX-12)*, UK, 2012
11. Eliahu Khalastchi, **Meir Kalech** ,Lior Rokach, Multi-Layered Model Based Diagnosis in Robots, , in the *Twenty Third International Workshop on Principles of Diagnosis (DX-12)*, UK, 2012

12. Yedidya Bar-Zeev, **Meir Kalech** ,Roni Stern, Diagnosing the Root Cause of Accidents in Autonomous Vehicle Environments, in the *Twenty Fourth International Workshop on Principles of Diagnosis (DX-13)*, Jerusalem, 2013
13. Eliahu Khalastchi, **Meir Kalech** ,Lior Rokach, A Hybrid Approach for Fault Detection and Diagnosis in Autonomous Systems, in the *Twenty Fourth International Workshop on Principles of Diagnosis (DX-13)*, Jerusalem, 2013
14. Roni Stern, **Meir Kalech**, Alexander Feldman, Shelly Rogov, Tom Zamir, Finding All Diagnoses is Redundant, in the *Twenty Fourth International Workshop on Principles of Diagnosis (DX-13)*, Jerusalem, 2013
15. Roni Stern, **Meir Kalech**, Orel Elimelech, Hierarchical Diagnosis in Strong Fault Models, in the *Twenty Fifth International Workshop on Principles of Diagnosis (DX-14)*, Graz, 2014
16. Roni Stern, **Meir Kalech**, Repair Planning with Batch Repair, in the *Twenty Fifth International Workshop on Principles of Diagnosis (DX-14)*, Graz, 2014
17. Eliahu Khalastchi, **Meir Kalech** and Lior Rokach, Improving a Multiagent Team with a Model-Based Diagnosing Coach, in the *Twenty Fifth International Workshop on Principles of Diagnosis (DX-14)*, Graz, 2014
18. Roni Stern, **Meir Kalech**, Hilla Shinitzky: Implementing Troubleshooting with Batch Repair. *DX@Safeprocess* 2015: 113-118
19. Amir Elmishali, Roni Stern, **Meir Kalech**: Data-Augmented Software Diagnosis. *DX@Safeprocess* 2015: 247-252
20. Ester Lazebnik, Roni Stern, **Meir Kalech**, Solving Sequential Diagnosis by Compilation to Boolean Satisfiability, in *the Twenty Seventh International Workshop on Principles of Diagnosis* (*DX-16)*, 2016
21. Ori Bar-Ilan, Roni Stern, **Meir Kalech**, Learning Software Behavior for Automated Diagnosis, in *the Twenty Eighth International Workshop on Principles of Diagnosis* (*DX-17)*, 2017
22. Netanel Hasiddi, Roni Stern, **Meir Kalech**, Main Dilemmas in Anticipatory Troubleshooting, in *the Twenty Eighth International Workshop on Principles of Diagnosis* (*DX-17)*, 2017
23. Lior Chen, **Meir Kalech,** Roni Stern, Dennis Potashnik, Estimating Information Loss with Incomplete Queries, in *the Twenty Ninth International Workshop on Principles of Diagnosis* (*DX-18)*, 2018
24. Amir Elmishali, **Meir Kalech,** Roni Stern, DeBGUer: A Tool for Bug Prediction and Diagnosis @ BGU, in *the Twenty Ninth International Workshop on Principles of Diagnosis* (*DX-18)*, 2018
25. *Roshanski, I., **Kalech, M**., Stern, R. and Elmishali, A., The Cold Start Problem in Software Fault Prediction, in *the Thirty International Workshop on Principles of Diagnosis* (*DX-19)*, 2019

26. *Dean Cazes, **Meir Kalech**, Model-Based Diagnosis with Uncertain Observations, in *the Thirty International Workshop on Principles of Diagnosis* (*DX-19),* 2019
27. *Avraham Natan, **Meir Kalech**, Distributed Diagnosis of Multi-Agent Plans, in *the 31st International Workshop on Principles of Diagnosis* (*DX-20),* 2020
28. *Bruno Sotto-Mayor, Amir Mishali, **Meir Kalech**, Rui Abreu, Exploring Designite for Smell-Based Defect Prediction, in *the 31st International Workshop on Principles of Diagnosis* (*DX-20),* 2020
29. *Ariel Gorenstein, **Meir Kalech**, Waterline Fault Prediction and Maintenance, in the 31st International Workshop on Principles of Diagnosis (DX-20), 2020
30. *Michal Nekvinda, Roman Barták, **Meir Kalech**, Contingent Planning for Robust Multi-Agent Path Finding, Proceedings of the International Symposium on Combinatorial Search 12(1), 185-187, 2021/7/21
31. *Bruno Sotto-Mayor, **Meir Kalech**, Cross-Project Smell-Based Defect Prediction, in *the 32nd International Workshop on Principles of Diagnosis* (*DX-21),* 2021
32. *Argaman Mordoch, Avraham Natan, Amir Elmishali and **Meir Kalech**, Bugs Assignment for Workload Distribution, in *the 32nd International Workshop on Principles of Diagnosis* (*DX-21),* 2021
33. * Amir Elmishali and **Meir Kalech**, Issue-Driven Features for Software Fault Prediction, in *the 32nd International Workshop on Principles of Diagnosis* (*DX-21),* 2021

Abstract and Posters:

1. **Kalech, M**. Kaminka, A. G. Diagnosing multi-agent Systems, *in IEEE International Conference on Software, Science, Technology and Engineering*, 2003
2. **Kalech, M.** Kaminka, A. G.**,** Diagnosing a Team of Agents: Scaling-Up, *the Third International Joint Conference on Autonomous Agents and Multiagent Systems (AAMAS-04)*, 2004
3. **Kalech, M.** Kaminka, A. G.**,** Model-based Diagnosis of Multi-agent Systems *the Fourth International Joint Conference on Autonomous Agents and Multiagent Systems (AAMAS-05),* 2005
4. Roni Stern, **Meir Kalech** and Ariel Felner, Searching for a k-Clique in Unknown Graphs, *the Ninth International Joint Conference on Autonomous Agents and Multiagent Systems (AAMAS-10),* 2010
5. Yedidia Bar-Zeev, **Meir Kalech**, Roni Stern, Diagnosing Faults in a Temporal Multi-Agent Resource Allocation, *the 13th International Joint Conference on Autonomous Agents and Multiagent Systems (AAMAS*-14), 2014

6. Reuth Mirsky, Ya'akov (Kobi) Gal, Roni Stern, **Meir Kalech**, Sequential Plan Recognition, *the 15th International Joint Conference on Autonomous Agents and Multiagent Systems (AAMAS*-16), pp. 1347-1348, 2016
7. Reuth Mirsky, Roni Stern, Ya'akov (Kobi) Gal, **Meir Kalech**, Plan Recognition Design, *AAAI-17*, pp. 4971-4972, 2017
8. Eliahu Khalastchi, **Meir Kalech**, Efficient Hybrid Fault Detection for Autonomous Robots. *AAMAS-20*, pp. 1884-1886, 2020

• Lectures and Presentations at Invited Seminars not Followed by Published Proceedings

1. 2003, 2004, 2006: Computer Science department, Bar-Ilan University
   1. Model-Based Diagnosis of Coordination Failures
   2. Diagnosis of Multi-Agent Systems: Scaling-Up
   3. Matrix-Based Representation for Coordination Fault Diagnosis: A Formal Approach
2. 2005: Computer Science & Industrial and Systems Engineering Departments, University of Southern California
   Diagnosing a Team of Agents
3. 2006: IBM Research, Haifa.
   An Introduction to Model-Based Diagnosis
4. 2006, 2007, 2009, 2010: Information System Engineering, Ben-Gurion University.
   1. Model-Based Diagnosis of Coordination Failures
   2. Diagnosis of Multi-Agent Systems: Scaling-Up
   3. Practical Voting Rules with Partial Information
   4. Decision Making with Dynamically Arriving Information
5. 2007, 2008, 2009: School of Engineering and Applied Sciences, Harvard University
   1. Practical Voting Rules with Partial Information
   2. Matrix-Based Representation for Coordination Fault Diagnosis: A Formal Approach
   3. Decision Making with Dynamically Arriving Information
6. 2008, 2009: Computer Science and Artificial Intelligence Laboratory, MIT
   1. **Practical Voting Rules with Partial Information**
   2. Decision Making with Dynamically Arriving Information
7. 2009: Electrical Engineering, Mathematics and Computer Science, Delft University of Technology.
   Model-Based Diagnosis of Coordination Failures
8. 2009: Dipartiment of Information, Università di Torino.
   Model-Based Diagnosis of Coordination Failures

9. 2010: Computer Science department, Ben-Gurion University
   Decision Making with Dynamically Arriving Information
10. 2013: **Artificial Intelligence Techniques to Improve Software Testing,** in the Software quality and testing – academia and industry symposium
11. 2015: **Using Artificial Intelligence Methods to Automate Software Testing,** Ostwestfalen-Lippe University of Applied Sciences, Germany
12. 2017: **Main Dilemmas in Anticipatory Troubleshooting**, DX-17, Italy
13. 2017: **Anticipatory Troubleshooting**, PHM-17, Israel
14. 2018: **Anomaly / Fault Detection Using a DATA SCIENCE approach,** PHM-18, Israel
15. 2018: **Estimating Information Loss with Incomplete Queries,** DX-17, Warsaw
16. 2018, **DeBGUer: A Tool for Bug Prediction and Diagnosis @ BGU**, DX-17, Warsaw
17. 2018, **Model-Based Diagnosis with Multiple Observations,** Charles Univerity, Prague
18. 2019, **AI for Software Quality Assurance**, DX-19, Austria
19. 2020, **AI for Software Quality Assurance**, AAAI-20, NY
20. 2021, **AI for Software Quality Assurance**, Intel WeekTech, Israel
21. 2022, **Model-Based Diagnosis of Multi-Agent Systems: A Survey**, AAAI-22, online
22. 2022, **Model-Based Diagnosis of Multi-Agent Systems: A Survey**, King's College, London University

• **Patents**

1. **Meir Kalech**, Sarit Karus, Gal A. Kaminka, and Claudia V. Goldman-Shenhar, Voting by Peers with Limited Resources, Patent granted No. 11/905,481, USA, 2011.
2. E Khalastchi, G Kaminka, R Lin, **M Kalech**, Anomaly detection methods, devices and systems, Patent granted US 4/257,130, 2015
3. Eliyahu Khalastchi, **Meir Kalech,** Lior Rokach, Sensor fault detection and diagnosis for autonomous systems, Patent granted US14/257,130, USA, 2017
4. **Meir Kalech** and Roni Stern, Using model-based diagnosis to improve software testing**,** Patent application 61/936,370, USA, 2018
5. **Meir Kalech** and Roni Stern, Combined model-based approach and data driven prediction for troubleshooting faults in physical systems, Patent application US15/823,116, Pending, 2018
6. **Meir Kalech** and Roni Stern, Data-augmented software diagnosis method and a diagnoser therefor**,** Patent granted US15/442,773, USA, 2019

7. Lior Chen, **Meir Kalech**, Dennis Potashnik, Ron Zvi Stern, Generating responses to queries based on selected value assignments, Patent Application US 16/115,622, Issued, 2020

- **Research Grants**

2013-2016	ISF- Meir Kalech[PI] and Michael Codish[PI], Compact Encoding of Model-Based Diagnosis to Boolean Satisfiabilty	800,000NIS (4 years)
2017-2020	ISF - Meir Kalech[PI] , Anticipatory Troubleshooting	800,000NIS (4 years)
2020-2022	Ministry of Science and Technology in Cooperative Scientific Research with the Czech Republic (Roman Bartack) - Diagnosis and Troubleshooting for the Execution of Multi-Robot-Path-Finding Plans	621,000 NIS
2021-2023	Ministry of Science and Technology (with Gal Kaminka), How is Intelligent Robotics Software Different than Other Software?	600,000 NIS

- **Government and Industrial Projects**

2010-2012	Meir Kalech[PI], Lior Rokach[PI], Using Anomaly Detection Techniques to Diagnose and Prognosticate Faults in Vehicles (joint with General Motors)	$70000
2013 -	Kamin Program (Chief Scientist): Meir Kalech[PI], Using Artificial Intelligence Methods to Automate Software Testing	327,000 NIS
2014	Project joint with IBM research center in BGU: Meir Kalech[PI] and Lior Rokach[PI], User Profiling and Anomaly Detection	$75000
2015-2017	Cyber Security Center: Meir Kalech[PI], Anomaly Detection Using Temporal Pattern Recognition for SCADA Systems	400,000 NIS
2016	Project joint with IBM research center in BGU: Meir Kalech[PI] and Lior Rokach[PI], User Profiling and Anomaly Detection	$120,000
2017	Project joint with IBM research center in BGU: Meir Kalech[PI] and Roni Stern[PI], Threat Sharing Models and Representations	400,000 NIS
2017-2019	Project joint with Mekorot: Meir Kalech[PI] and Roni Stern[PI], Fault Prediction in Water Mains	300,000 NIS

2018-2019	Project joint with Mafat: Meir Kalech[PI], Kobi Bortman and Lior Rokach[PI], Diagnosis of Rotating Systems	150,000 NIS
2020-2022	Cyber Security Center: Meir Kalech[PI], Testing Vulnerable Software Components	600,000 NIS
2021-2020	Project joint with Mafat: Meir Kalech[PI], Extracting RCS signature of radar targets free of measurement artifact using machine learning technologies	100,000 NIS

- # Research Synopsis

My research contributions are in four distinct areas of artificial intelligence (AI): (1) Model-Based Diagnosis, (2) Autonomous Systems, (3) AI techniques for Software Quality Assurance and, (4) Voting Systems. My achievements are evidenced by over 70 papers published in prestigious journals and conferences, 14 competitive and industrial grants, and 7 patents. Next, I specify my contributions in each research area.

Model-Based Diagnosis

Model-based diagnosis (MBD) is a principled approach for automatically diagnosing the root cause of faults in systems. MBD is a well-known research area in AI that has begun his first steps in the 80's with the fundamental papers of Reiter [Reiter, 1987] and deKleer and Williams [Dekleer and Williams, 1987].

My PhD. dissertation is the first comprehensive work that proposes MBD methods for multi-agent systems. I introduced the challenge of diagnosing coordination faults that take place at the boundaries between the agents and their environment, including other agents. Continuing with a centralized approach [Kalech and Kaminka, 2005], I introduced a distributed model-based coordination-failure diagnosis approach [Kalech and Kaminka, 2006]. The following year, I introduced a novel design space of coordination-diagnosis algorithms [Kalech and Kaminka, 2007]. I used the term "social diagnosis" to describe the process that diagnoses the root cause of agents disagreement. I extended this work to scale well with a high number of agents [Kalech and Kaminka, 2011]. In a following work [kalech, 2012], I proposed a matrix-based representation for the coordination between the agents.

In 2017, I proposed a different approach, that integrates diagnosis of multi-agent plans and coordination faults [Elimelech *et al.*, 2017]. I proposed a model based approach to diagnose resource usage failures in multi-agent systems. In a later work, I [Natan and Kalech, 2021] extended this framework to distributed diagnosis, where the agents collaborate to compute the diagnosis without sharing their plans. **I have summarized 20 years of research in Model-Based Diagnosis of Multi-Agent System in a survey [Kalech and Natan, AAAI-2022].**

Beyond the MBD for MAS research area, I contributed to model-based diagnosis research, both in theory and in practical algorithms. To address diagnosis problems, **I established the Fault Detection and Diagnosis Lab at BGU** https://www.ise.bgu.ac.il/aidnd/index.html, which promotes research with the government and leading corporations such as General Motors, Mekorot and IBM. In 2012 [Stern, 2012] I examined the duality of the relation between conflicts and diagnoses, and used this theory to interleave the search for diagnoses and conflicts. In 2014 [Metodi, 2014] I presented a SAT-based algorithm for model-based diagnosis, which is still considered as the fastest algorithm. In addition, I published papers on the use of diagnosis for troubleshooting [Hasidi, 2016, Stern, 2016, Hasidi, 2021]. I have been awarded 10 grants for the diagnostic research. In the last years I started to work on cyber security research. Cyber security tries to identify anomalous events, users

communication etc. This is related to my background of trying to identify faults and to reason about their root cause. In this research I use especially machine learning techniques. For example, anomaly detection using temporal pattern recognition for SCADA systems, anomalous user detection by user profiling, and threat sharing models and representations. I published several papers in this field [Biton *et al.*, 2018, Kalech, 2019, Shlomo *et al.*, 2021]. Nowadays, I work on integrating deep-learning techniques for temporal pattern recognition in SCADA systems

In October 2021 I submitted a grant request to ISF in the topic of Privacy-Aware Diagnosis of Multi-Agent systems. The main objective of the proposal is developing novel diagnosis algorithms for multi-agent systems that consider privacy. We propose algorithms for multi-agent systems, where agents do not want to share their plans and goals with other parties. In addition, nowadays I work (with Roni Stern, Son Tran and William Yeoh) on a grant planned to be submitted to BSF-NFS on the topic of Realtime and Online Diagnosis of Multi-Agent Systems. In this research we address the diagnosis challenge for multi-agent systems, which must continue to function normally within a fixed, tight, time constraint. The agents must therefore intelligently balance the time they devote to diagnosis with the time spent in planning and executing repair actions, to ensure the system is repaired within the allotted time.

Fault Detection and Diagnosis for Autonomous Systems

Modern mechanical systems are saturated with sensors. Faults that occur due to false sensing or runtime errors as well as hardware failures need to be detected quickly and the root cause that caused that failure must be diagnosed. This presents significant challenges: (1) quickly detect the fault with high precision (2) identify the root cause of the failure (diagnosis) (3) support a decision which is derived from the implications of the fault. **I presented a series of papers to address these challenges by combining two AI approaches for fault detection and diagnosis** [Khalastchi *et al.*, 2011, Khalastchi and Kalech, 2013, Khalastchi *et al.*, 2015, Khalastchi and Kalech, 2017, Khalastchi and Kalech, 2018, Khalastchi and Kalech, 2018, Khalastchi and Kalech, 2019, Khalastchi and Kalech, 2020]. (1) *model-based diagnosis:* the different layers of the system are modeled: the low level of the components, actuators and sensors and higher levels as abstracted in the onboard system computer. In addition, the connections between the layers are modeled. Based on these models, we describe fault detection and diagnosis techniques. (2) *data driven:* we online learn the dependencies between sensors. Then we use the dependencies and a structural model of the system to diagnose faults. I presented methods to combine these two approaches by tracking both the higher level abstractions as well as the sensors' readings. I filed two patents based on this research, and were awarded one grant for this research.

In June 2022, I applied a grant request to the Israel Innovation Authority with *Maris-Tech* company, to implement fault prediction and diagnosis in drones. In this research, I plan to implement the algorithms developed in my lab, as well as deep learning-based algorithms, on drones.

AI Techniques for Software Quality Assurance

Modern software systems are highly complex and often have multiple dependencies on external parts such as other processes or services. This poses new challenges and exacerbate existing challenges in different aspects of software Quality Assurance (QA) including testing, debugging and repair. **I presented a series of papers that propose a novel AI paradigm for software QA** [Zamir *et al.*, 2014, Elmishali *et al.* 2016, Elmishali *et al.*, 2018, Elmishali *et al.*, 2019, Elmishali *et al.*, 2020, Elmishali *et al.*, 2021, Bruno Sotto-Mayor *et al*, 2021].

In my research we propose a quality assessment AI component that uses machine-learning techniques to predict where coding errors are likely to occur. Then a test generation AI agent considers the error predictions to direct automated test generation. Then a test execution AI agent executes tests, that are passed to the root-cause analysis AI agent, which applies automatic debugging algorithms. The candidate root causes are passed to a code repair AI agent that tries to create a patch for correcting the isolated error**. I presented this paradigm in the senior track of AAAI-20 "AI for Software Quality Assurance"** [Kalech and Stern, AAAI-2020]. I filed three patents based on this research, and was awarded three grants for this research. Recently, I co-edited a book in this field:

Kalech, Meir, Rui Abreu, and Mark Last, eds. Artificial Intelligence Methods For Software Engineering. World Scientific, 2021.

Nowadays, we work on a novel problem of software defect prediction techniques, where the defective information is not available in the training set. In that case, we need to rely on an alternate approach that uses the training set of external projects to train the classifier. This approached is called cross-project defect prediction.

Voting with Partial Information

Voting is an essential decision-making mechanism in multi-agent systems (MAS) that allows multiple agents to rank possible candidates and chooses a winner that reflects their joint preferences. Previous work has typically assumed that the voters provide a complete set of preferences to the center. However, In real-world applications, it may be impractical to expect individuals to provide all their preferences for a large number of candidates, from the perspective of the human interface and due to the need to interrupt the human as less as possible. In practice, it is possible to determine a winner by specifically requesting agents for certain preferences rather than for their whole set of preferences. A key question is what partial information is essential for determining a winner? **I addressed this research question in a series of papers and proposed algorithms for voting with partial information [**Naamani *et al.*, 2010, Kalech *et al.*, 2011, Dery *et al.*, 2014, Naamani *et al.*, 2014, Naamani *et al.*, 2015, Naamani *et al.*, 2015, Naamani *et al.*, 2016, Lesser *et al.*, 2017]. I filed one patent based on this research.

- # Teaching Statement

I started teaching in 1998, five years before I started my Ph.D. I love to teach and this is one of the reasons I left a solid work in Motorola as a programmer and began to teach and and eventually pursue a career in academia. My teaching experience includes, not only regular teaching in the academia, but also preparing new courses for students who has no studying habitats at all – Charedim. Teaching this population is challenging, and I gained a lot from it. Following this experience I decided to write a Data Structures textbook. This textbook has been learned as the official textbook for years in several colleges. Aside from this unique experience, I have taught in professional institutions that give special courses for companies, as well as in universities (Bar-Ilan, Ariel and Ben-Gurion).

In teaching, I draw inspiration from Rashi, a sage from the 11th Century. Rashi explains the difference between Chacham (smart) and Navon (wise). Chacham understands very well at class, but Navon has the ability to figure out new things from what he learned in class on his own. I believe students of the 21st Century need more than just knowledge. Students must be able to think critically and creatively skills in order to compete for jobs in the future. To encourage a critical thinking approach, I consistently ask my students to analyze concepts that I teach from multiple competing perspectives. Obviously, I teach the required materials, however, beyond this, I ask many leading questions at class, forcing the students to think in order to respond – they must be, then, Nevonim. I embrace an inquiry-based learning approach whereby I start with a question and students come up with hypotheses for answering the questions. Through this approach, students exercise skills like ‘predicting’ and ‘testing’ to seek knowledge.

By encouraging my students to have development mindsets, I establish high criteria and expectations for them. All of my students are aware that I expect them to put forth their best effort and strive for progress on a daily basis. In programming courses, for instance, I believe that a skilled programmer, particularly, is one who has worked hard on her own. That is why I direct my TAs to assign really difficult exercises to the students. Although the students put in a lot of effort, at the end of their undergraduate studies, they admit that it was because of their efforts that they were able to succeed.

Finally, my teaching philosophy is reflected in my examinations. My examinations assess the students' knowledge as well as their comprehension. For example, in the Algorithms course, they must be familiar with the many algorithms and proofs that were discussed in class. However, they are judged on their ability to solve new problems as well as their profound comprehension of the principles and assumptions that lie beneath the algorithms.