



# Gal Oren

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## Work experience

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Israel Atomic Energy Commission: Nuclear  
Research Center - Negev / Soreq

2011 — Present

Computer Scientist

2011-Present: Computer Scientist

» Senior Researcher, Katzir Fellow.

» Conducting multidisciplinary R&D and innovation techniques.

2014-2017: Head, Algorithms group

» Leading 6 highly trained CS researchers for R&D activity.

2017-2020: Head, Scientific Computing Laboratory

» Founding and leading the lab for multidisciplinary R&D and innovation, staff of 13.

» Forming many successful inter- and exo- organization collaborations, including LLNL, NIST, CEA, GSI, Google.

2020-Present: Head, NRCN-SNRC Scientific Computing Mission.

Topics of Interest: High-Performance Computing & Supercomputing; Distributed, Parallel & Cluster Computing; Artificial Intelligence; Research Software Engineering; Immersive & Scientific Visualization.

Technion - Israel Institute of Technology

2020 — Present

Visiting Scientist, Department of Computer Science

- Head, **Intel oneAPI Center of Excellence @ Technion**.
- Israel's Official National Supercomputer Project Advisory Board member.
- Dr. Gal Oren, Prof. Danny Hendler, Prof. Hagit Attiya - Pazy grant 226/20 for research proposal entitled **Recoverable Algorithms using Non-Volatile Memory for Simulations in High Performance Computing Systems**. 2021-2024. 1.2 Million NIS. - Ph.D. students: Yehonatan Fridman, Harel Levin. M.Sc. research students: Yehonatan Fridman, Yaniv Snir, Kfir Zvi, Dina Avitan.
- Dr. Gal Oren, Prof. Shai Avidan - Ph.D. student: Matan Rusanovsky.
- Dr. Gal Oren, Dr. Yuval Pinter, BGU data science full research proposal (2022) entitled **Code Language Parallel Processing** - Ph.D. student Re'em Harel. M.Sc. research students: Tal Kadosh, Nadav Schneider.
- CS Course 236606: "**Shared-Memory Parallelism: CPUs, GPUs and in-between**". [webcourse.cs.technion.ac.il/236606/Winter2022-2023](http://webcourse.cs.technion.ac.il/236606/Winter2022-2023).
- Reviewer in Conferences: DISC, SPAA, PERCOM.

TradeMarker

2018 — 2020

CEO

Co-founder @ TradeMarker.

## Education

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Department of Computer Science, Ph.D 2016 — 2020

Ben-Gurion University of the Negev

- Thesis: **Distributed Management Algorithms for Heterogeneous Computing Systems and Networks**
- Supervisors: Prof. Leonid Barenboim, Prof. Michael Elkin
- The Lynn and William Frankel Center for Computer Science Scholarship (2016, 2017, 2018, 2019, 2020)
- The Open University of Israel Research Fund Scholarship
- Support by the Israel Science Foundation grant 724/15

Department of Computer Science, M.Sc. 2011 — 2015

Open University of Israel

- Thesis: **Optimizations of Management Algorithms for Multi-Level Memory Hierarchy**
- Supervisors: Dr. Leonid Barenboim, Dr. Lior Amar
- Thesis final score: 94. Degree final score: 92. Magna cum laude.
- Foundation for the Advancement of Education in Israel Scholarship (2013)
- The Hillel Scholarship, the Open University of Israel (2014)
- Thesis Scholarship, Computer Science Master's Degree Program, the Open University of Israel (2015)

Swedish Summer School in Computer Science (S3CS) June 2016

KTH Royal Institute of Technology

S3CS consists of two mini-courses by Michael Mitzenmacher and Sergei Vassilvitskii.

Radboud Summer School August 2017

Radboud University

Cyberpsychology research course by Dr Jens Binder.

Department of Computer Science, B.Sc. 2006 — 2010

Jerusalem College of Technology

- First Degree while in High-School
- Scholarship for Excellence, Jerusalem College of Technology (2007)
- Gifted and Excellent Students Scholarship, Ministry of Education (2008)
- Technological Bagrut (53 units, score of 112), high school graduation (2010)

## Selected Publications

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### 1. Theses & Dissertations:

1. Gal Oren, **Distributed Management Algorithms for Heterogeneous Computing Systems and Networks**. Ph.D. Dissertation, Ben-Gurion University of the Negev, 2020.
2. Gal Oren, **Optimizations of Management Algorithms for Multi-Level Memory Hierarchy**. M.Sc. Thesis, the Open University, 2015.

### 2. Journal Papers:

1. Matan Rusanovsky, Ofer Beer, Gal Oren, **An End-to-End Computer Vision Methodology for Quantitative**

**Metallography**. *Scientific Reports* 12.1 (2022): 1-27.

- Leonid Barenboim, Gal Oren, **Distributed Backup Placement**. *Distributed Computing* (2022): 1-19.
- Shalev, Eyal, Stephen J. Bauer, Michael A. Homel, Tarabay H. Antoun, Eric B. Herbold, Oleg Y. Vorobiev, Harel Levin, Gal Oren, Vladimir Lyakhovskiy, **Borehole Breakout Modeling in Arkose and Granite Rocks**. *Geomechanics and Geophysics for Geo-Energy and Geo-Resources* 7, no. 1 (2021): 1-23.
- Re'em Harel, Idan Mosseri, Harel Levin, Lee-or Alon, Matan Rusanovsky, Gal Oren, **Source-to-Source Parallelization Compilers for Scientific Shared-Memory Multi-core and Accelerated Multiprocessing: Analysis, Pitfalls, Enhancement and Potential**. *International Journal of Parallel Programming* 48.1 (2020): 1-31.

### 3. Submitted preprints:

#### Selected List of Peer-Reviewed Selective Computer Science Conferences Submissions with Full Papers Indexed Proceedings

- Re'em Harel, Matan Rusanovsky, Ron Wagner, Harel Levin, Gal Oren, **Scalable SALE Benchmark Framework for Supercomputers**. arXiv preprint arXiv:2209.01983 (2022). SUBMITTED to the 37th IEEE International Parallel & Distributed Processing Symposium (IPDPS 2023).
- Re'em Harel, Yuval Pinter, Gal Oren, **Learning to Parallelize in a Shared-Memory Environment with Transformers**. arXiv preprint arXiv:2204.12835 (2022). SUBMITTED to the 27th ACM SIGPLAN Annual Symposium on Principles and Practice of Parallel Programming (PPoPP 2023).
- Yehonatan Fridman, Re'em Harel, Danny Hendler, Gal Oren, **The Case for Non-Volatile RAM in Cloud HPCaaS**. arXiv preprint arXiv:2208.02240 (2022). SUBMITTED to the International Workshop on Intelligent and Adaptive Edge-Cloud Operations and Services, In conjunction with the 15th IEEE/ACM Conference on Utility and Cloud Computing (UCC 2022).

### 4. Conferences Full Papers:

#### Selected List of Peer-Reviewed Selective Computer Science Conferences Publications with Full Papers Indexed Proceedings

- Nadav Schneider, Matan Rusanovsky, Raz Gvishi, Gal Oren, **Determining HEDP Foams' Quality with Multi-View Deep Learning Classification**. arXiv preprint arXiv:2208.07196 (2022). ACCEPTED to the 3rd Workshop on Artificial Intelligence and Machine Learning for Scientific Applications (AI4S 2022), the International Conference for High-Performance Computing, Networking, Storage, and Analysis (SC 2022).
- Fridman, Yehonatan, Yaniv Snir, Harel Levin, Danny Hendler, Hagit Attiya, Gal Oren, **Recovery of Distributed Iterative Solvers for Linear Systems Using Non-Volatile RAM**. arXiv preprint arXiv:2204.11584 (2022). ACCEPTED to IEEE/ACM 11th Workshop on Fault Tolerance for HPC at eXtreme Scale, the International Conference for High-Performance Computing, Networking, Storage, and Analysis (SC 2022); ACCEPTED to the Intel eXtreme Performance Users Group (IXPUG 2022).
- Yehonatan Fridman, Yaniv Snir, Matan Rusanovsky, Kfir Zvi, Harel Levin, Danny Hendler, Hagit Attiya, Gal Oren, **Assessing the Use Cases of Persistent Memory in High-Performance Scientific Computing**. IEEE/ACM 10th Workshop on Fault Tolerance for HPC at eXtreme Scale, the International Conference for High-Performance Computing, Networking, Storage, and Analysis (SC 2021); the Intel eXtreme Performance Users Group (IXPUG 2021).
- Yehonatan Fridman, Matan Rusanovsky, Gal Oren, **ChangeChip: A Reference-Based Unsupervised Change Detection for PCB Defect Detection**. IEEE International Conference on Physical Assurance and Inspection of Electronics (PAINE 2021).
- Gal Oren, Leonid Barenboim, **Backup Placement in WSNs in the Network Management Distributed Setting**. The First Workshop on Next-Generation Mobile Networking and Computing (NGMobile 2021), the 41st IEEE International Conference on Distributed Computing Systems (ICDCS 2021).
- Kfir Zvi, Gal Oren, **Optimized Memoryless Fair-Share HPC Resources Scheduling using Transparent Checkpoint-Restart Preemption**. First International Symposium on Checkpointing for Supercomputing

(SuperCheck 2021), the National Energy Research Scientific Computing Center (NERSC).

7. Gal Oren, Leonid Barenboim, **Distributed Backup K-Placement and Applications to Virtual Memory in Wireless Networks**. 2nd Workshop on Distributed Algorithms for Low-Functional Robots (WDALFR 2021), the 22nd International Conference on Distributed Computing and Networking (ICDCN 2021).
8. Re'em Harel, Matan Rusanovsky, Yehonatan Fridman, Assaf Shimony, Gal Oren, **Complete CVDL Methodology for Investigating Hydrodynamic Instabilities**. First International Workshop on the Application of Machine Learning Techniques to Computational Fluid Dynamics Simulations and Analysis, 35th International Supercomputing Conference (ISC-HPC, CFDML 2020); 12th Israel Machine Vision Conference (IMVC 2021).
9. Idan Mosseri, Lee-or Alon, Re'em Harel, Gal Oren, **ComPar: Optimized Compiler for Automatic OpenMP Source-to-Source Parallelization using Code Segmentation and Hyperparameters Tuning**. The 16th International Workshop on OpenMP (IWOMP 2020).
10. Matan Rusanovsky, Gal Oren, Sigalit Ifergane, Ofer Beeri, **MLography: An Automated Quantitative Metallography Model for Impurities Anomaly Detection using Novel Data Mining and Deep Learning Approach**. arXiv preprint arXiv:2003.04226, ACCEPTED to SIAM Conference on Mathematical Aspects of Materials Science (MS 2020).
11. Leonid Barenboim, Gal Oren, **Distributed Backup Placement in One Round and its Applications to Maximum Matching Approximation and Self-Stabilization**. The 3rd Symposium on Simplicity in Algorithms (SOSA 2020), co-located with the 31st ACM-SIAM Symposium on Discrete Algorithms (SODA 2020).
12. Leonid Barenboim, Gal Oren, **Fast Distributed Backup Placement in Sparse and Dense Networks**. SIAM Symposium on Algorithmic Principles of Computer Systems (APOCS 2020), co-located with the 31st ACM-SIAM Symposium on Discrete Algorithms (SODA 2020).
13. Re'em Harel, Gal Oren, **GraphiX: A Fast Human-Computer Interaction Symmetric Multiprocessing Parallel Scientific Visualization Tool**. The 15th International Parallel Computing Conference (ParCo 2019).
14. Harel Levin, Gal Oren, Eyal Shalev, Vladimir Lyakhovsky, **Acceleration of Hydro Poro-elastic Damage Simulation in a Shared-Memory Environment**. The 15th International Parallel Computing Conference (ParCo 2019).
15. Idan Mosseri, Matan Rusanovsky, Gal Oren, **TradeMarker - Artificial Intelligence Based Trademarks Similarity Search Engine**. The 21st International Conference on Human-Computer Interaction (HCI 2019).
16. Gal Oren, Leonid Barenboim, Harel Levin, **Distributed Fault-Tolerant Backup-Placement in Overloaded Wireless Sensor Networks**. The 9th International Conference on Broadband Communications, Networks, and Systems (BROADNETS 2018).
17. Gal Oren, Guy Malamud, **CalCul: A Python-based Workspace for High-Performance Parameters-Survey in Scientific Legacy Codes**. The 14th international Parallel Computing conference (ParCo 2017).
18. Gal Oren, Leonid Barenboim, Harel Levin, **Adaptive Distributed Hierarchical Sensing Algorithm for Reduction of Wireless Sensor Network Cluster-Heads Energy Consumption**. The 13th International Wireless Communications and Mobile Computing Conference (IWCMC 2017).
19. Gal Oren, Leonid Barenboim, Harel Levin, **Load-Balancing Adaptive Clustering Refinement Algorithm for Maximization of Wireless Sensor Network Clusters Lifetime**. The 15th International Conference on Wired/Wireless Internet Communications (WWIC 2017).
20. Gal Oren, Yehuda Ganan, Guy Malamud, **AutOMP - An Automatic OpenMP Parallelization Generator for Variable-Oriented High-Performance Scientific Codes**. The 7th International Supercomputing Conference 2017 (ISUM 2017) - Best paper - International Journal of Combinatorial Optimization Problems and Informatics, vol. 9, no. 1, pp. 46-53, Feb. 2018.
21. Gal Oren, Lior Amar, David Levi-Hevroni, Guy Malamud, **The Looking-Glass System: A Unidirectional System for Secure Data Transfer using an Optic Medium**. The 2nd International Conference on Future Network Systems and Security 2016 (FNSS 2016 - Previously IoT-CT at WiMob).
22. Gal Oren, Leonid Barenboim, Lior Amar, **Memory-Aware Management for Heterogeneous Main Memory Complex using an Optimization of the Aging Paging Algorithm**. 2016 Workshop on High-Performance Computing for Big Data (HPC4BD) in conjunction with the 45th International Conference on Parallel Processing

5. *Patents:*

1. Idan Mosseri, Matan Rusanovsky, Gal Oren, inventors; Israel Atomic Energy Commission, assignee, **Similarity Search Engine for a Digital Visual Object**. United States patent application US 17/282,574. 2021 Nov 4.

6. *Posters and Extended Abstracts:*

**Selected List of Peer-Reviewed Selective Computer Science Conferences Poster Presentations**

1. Re'em Harel, Yuval Pinter, Gal Oren, **Learning to Parallelize Source Code via OpenMP with Transformers**. Extended Abstract and Research Poster, ACCEPTED to The International Conference for High-Performance Computing, Networking, Storage, and Analysis (SC 2022); Research Poster, the Israel Seminar on Computational Linguistics (ISCOL 2022).
2. Yehonatan Fridman, Yaniv Snir, Harel Levin, Danny Hendler, Hagit Attiya, Gal Oren, **Non-Volatile Exact-State-Reconstruction of Preconditioned Conjugate Gradient in Supercomputers**. Research Poster, Platform for Advanced Scientific Computing (PASC 2022); Research Poster, 37th International Supercomputing Conference (ISC-HPC 2022).
3. Harel Levin, Gal Oren, Ilan Mizrahi, Emil Malka, Eran Brown, **Initial Evaluation of InfiniBox Storage System For Embarrassingly Parallel HPC Applications In Small to Mid-range Supercomputers**. Research Poster, 35th International Supercomputing Conference Research Posters (ISC-HPC 2020).
4. Idan Mosseri, Lee-or Alon, Re'em Harel, Gal Oren, **ComPar: Optimized Compiler for Automatic OpenMP Source-to-Source Parallelization using Code Segmentation and Hyperparameters Tuning**. Ph.D. Forum Poster, the 35th International Supercomputing Conference (ISC-HPC 2020).
5. Gal Oren, Leonid Barenboim, **Distributed Backup Placement in WSNs and Planar Graphs**. Ph.D. Forum Poster, the 7th Global Young Scientists Summit (GYSS'19).
6. Idan Mosseri, Re'Em Harel, Harel Levin, Matan Rusanovsky, Gal Oren, **Automatic Parallelization for Shared Memory Scientific Multiprocessing**. Research Poster, the 14th International Workshop on OpenMP 2018 (IWOMP 2018); Research Poster, the 30th International Symposium on Computer Architecture and High-Performance Computing (SBAC-PAD 2018).
7. Gal Oren, Leonid Barenboim, Harel Levin, **Distributed Fault-Tolerant Backup-Placement in Overloaded Wireless Sensor Networks**. Research Poster and Extended Abstract, the 11th ACM International on Systems and Storage Conference (SYSTOR 2018); Ph.D. forum Poster, the 32nd IEEE International Parallel & Distributed Processing Symposium (IPDPS 2018).
8. Gal Oren, Leonid Barenboim, Lior Amar, **Memory-Aware Management for Heterogeneous Main Memory Complex Using an Optimization of the Aging Paging Algorithm**. Research Poster and Extended Abstract, the 9th ACM International on Systems and Storage Conference (SYSTOR 2016).

7. *Invited talks:*

1. Gal Oren, **Invited talk - The Role of Computer Vision in SOTA Metallography**. Computer Vision for Civil and Infrastructure Engineering Workshop, the International Conference on Computer Vision (CVCIE, ICCV, 2023).
2. Idan Mosseri, Re'Em Harel, Harel Levin, Matan Rusanovsky, Gal Oren, **Automatic Parallelization for Shared Memory Scientific Multiprocessing**. OpenMPCon Developers Conference (OpenMPCon 2018), the 14th International Workshop on OpenMP 2018 (IWOMP 2018).
3. Idan Mosseri, Matan Rusanovsky, Gal Oren, **TradeMarker - Under the Hood**. Google AI for Social Good Workshop, Bangkok 2018.
4. Gal Oren, Shimon Shmoely, **How Governments can use AI for Public Service Delivery?** United-Nations & Google AI for Social Good Summit, Bangkok 2018.

5. Gal Oren, **TradeMarker - Artificial Intelligence based Trademarks Similarity Search Engine**. Policy Implementation in the Age of Big Data Conference, the Knesset 2018.
6. Gal Oren, Idan Mosseri, Matan Rusanovsky, **TradeMarker - One of Seven leading AI for Social Good Projects of 2018**. AI for Social Good conference, Google Headquarters, California 2018.

## Awards

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- Nuclear Research Center - Negev CEO Award - Innovation category - Computer Vision (2022)
- Nuclear Research Center - Negev CEO Award - Innovation category - Artificial Intelligence (2020)
- International Supercomputing Conference (ISC) PhD Forum Award (2020)
- Selected for GYSS-2019 - Global Young Scientist Summit for outstanding PhDs (2019)
- Bronze student design award, HCI International (2019)
- Nuclear Research Center - Negev CEO Award - Innovation category - Cybersecurity (2018)
- Nuclear Research Center - Negev CEO Award - Exemplary Mission category - Supercomputing (2018)
- Maccabim Foundation Scholarship for PhD Students (2017, 2018, 2019, 2020)
- Students Leading Innovation in the Public Sector - Finalist, Google & Ben-Gurion University (2018)
- Nuclear Research Center - Negev CEO Fund - 1st prize (2017), 2nd prize (2018)
- Department of Physics Award for Best Researches, Nuclear Research Center - Negev (2016)
- The Katzir Fellowship, Israel Ministry of Defense (2016)
- Ministry of Culture Prize for Literature (2015)
- Excellent Paper Award, the 3rd International Conference on Environment and Industrial Innovation – ICEII, Copenhagen, Denmark (2013)
- The Encouraging Creativity Among Scientists Prize, Weizmann Institute of Science (2013)
- Third Grand Award in Environmental Management category, the Intel International Science and Engineering Fair, Pittsburgh, Pennsylvania, the United States (2012)
- Third Special Award in Sustainable Water Management category , the Intel International Science and Engineering Fair, Pittsburgh, Pennsylvania, the United States (2012)
- Intel Prize, the European Union Contest for Young Scientists, Helsinki, Finland (2011)
- 1st Prize in Technology field, the National Young Scientist and Engineers Competition in Israel, Hebrew University of Jerusalem (2011)
- Honor Diploma from Her Royal Highness Crown Princess Victoria of Sweden, Stockholm Junior Water Prize, World Water Week, Stockholm, Sweden (2010)
- Stockholm Junior Water Prize in Israel, Tel Aviv University (2010)
- President of Israel Commendation for an original scientific study, the National Young Scientist and Engineers Competition in Israel, Hebrew University of Jerusalem (2010)
- Chief Judge at the Hebrew Wikipedia Writing Competition (2010)
- Grand Award at the Hebrew Wikipedia Writing Competition (2009)
- President Zalman Shazar Prize for an original scientific study, the Zalman Shazar Center, Jerusalem (2009)

## Personal Info

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- Sex : Male
- Nationality : Israeli
- ID No.: 203127261
- Date of Birth : 7th July 1991
- Security Clearance: Top
- Languages: Hebrew (Mother tongue), English (Fluent)