Niv Dayan CV

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nivdayan.net

EDUCATION & RESEARCH EMPLOYMENT

Assistant Professor, University of Toronto, Canada	2023 - now
Advisory Board Member, Speedb, Israel	2022 - 2024
Postdoctoral Researcher, Copenhagen University, Denmark	2022
Research Scientist, Pliops, Israel	2019 - 2022
Postdoctoral Researcher, Harvard, USA	2015 - 2019
PhD in Computer Science, IT University of Copenhagen, Denmark	2012 - 2015
MSc in Software Development, IT University of Copenhagen, Denmark	2010 - 2012
BSc in Computing and Economics, University of Dundee, Scotland	2007 - 2010

CONFERENCE PAPERS

Diva: Dynamic Range Filter for Var-Length Keys and Queries. Navid Eslami, Ioana O. Bercea, Niv Dayan.	**VLDB 2025**
Sphinx: A Succinct Perfect Hash Index for x86. Sajad Faghfoor Maghrebi, Niv Dayan.	**VLDB 2025**
Memento Filter: A Fast, Dynamic, and Robust Range Filter. Navid Eslami, Niv Dayan.	**SIGMOD 2025**
Aleph Filter: To Infinity in Constant Time. Niv Dayan, Ioana Bercea, Rasmus Pagh.	**PVLDB 2024**
InfiniFilter: Expanding Filters to Infinity and Beyond. Niv Dayan, Ioana Bercea, Pedro Reviriego, Rasmus Pagh.	**SIGMOD 2023**
Spooky: Granulating LSM-Tree Compactions Correctly. Niv Dayan, Tamar Weiss, Shmuel Dashevsky, Michael Pan, Edward Bortnikov, Moshe Twitto.	**PVLDB 2022**
The End of Moore's Law and the Rise of The Data Processor. Niv Dayan, Moshe Twitto, Yuval Rochman, Uri Beitler, Itai Ben Zion, Edward Bortnikov, Shmuel Dashevsky, Shmuel Dashevsky, Evgeni Ginzburg, Igal Maly, Avraham (Poza) Meir, Mark Mokryn, Iddo Naiss, Noam Rabinovich.	**PVLDB 2021**
Chucky: A Succinct Cuckoo Filter for LSM-Tree. Niv Dayan, Moshe Twitto.	**SIGMOD 2021**
Rosetta: A Robust Space-Time Optimized Range Filter for Key-Value Stores. Siqiang Luo, Subarna Chatterjee, Rafael Ketsetsidis, Niv Dayan, Wilson Qin, Stratos Idreos.	**SIGMOD 2020**
The Log-Structured Merge-Bush & the Wacky Continuum. Niv Dayan, Stratos Idreos.	**SIGMOD 2019**
Design Continuums and the Path Toward Self-Designing Key-Value Stores that Know and Learn. Stratos Idreos, Niv Dayan, Wilson Qin, Mali Akmanalp, Sophie Hilgard, Andrew Ross, James Lennon, Varun Jain, Harshita Gupta, David Li, and Zichen Zhu.	**CIDR 2019**
Dostoevsky: Better Space-Time Trade-Offs for LSM-Tree Based Key-Value Stores via Adaptive Removal of Superfluous Merging. Niv Dayan, Stratos Idreos.	**SIGMOD 2018**

Coconut: A Scalable Bottom-Up Approach for Building Data Series Indexes. Haridimos Kondylakis, Niv Dayan, Kostas Zoumpatianos, Themis Palpanas. **PVLDB 2018**

Monkey: Optimal Navigable Key-Value Store. Niv Dayan, Manos Athanassoulis, Stratos Idreos. Best of SIGMOD Award. **SIGMOD 2017**

Data Canopy: Accelerating Exploratory Statistical Analysis. Abdul Wasay, Xinding Wei, Niv Dayan, Stratos Idreos. **SIGMOD 2017**

GeckoFTL: Scalable Flash Translation Techniques For Very Large Flash Devices. Niv Dayan, Phillippe Bonnet, Stratos Idreos. **SIGMOD 2016**

JOURNAL PAPERS

On the Security of Quotient Filters: Attacks and Potential Countermeasures. Pedro Reviriego, Miguel González, Niv Dayan, Gabriel Huecas, Shanshan Liu, Fabrizio Lombardi. **Trans. Comput. 2024**

Cardinality Estimation Adaptive Cuckoo Filters (CE-ACF): Approximate Membership Check and Distinct Query Count for High-Speed Network Monitoring. Pedro Reviriego, Jim Apple, Alvaro Alonso, Otmar Ertl, Niv Dayan. **TNET 2023**

Coconut: Sortable Summarizations for Scalable Indexes over Static and Streaming Data Series. Haridimos Kondylakis, Niv Dayan, Kostas Zoumpatianos, Themis Palpanas. **VLDBJ 2019**

Learning Data Structure Alchemy. Stratos Idreos, Kostas Zoumpatianos, Subarna Chatterjee, Wilson Qin, Abdul Wasay, Brian Hentschel, Mike Kester, Niv Dayan, Demi Guo, Minseo Kang, Yiyou Sun. **IEEE DEBull 2019**

Optimal Bloom Filters and Adaptive Merging for LSM-Trees. Niv Dayan, Manos Athanassoulis, Stratos Idreos. ACM Transactions on Database Systems, 2018. **TODS 2018**

The Periodic Table of Data Structures. Stratos Idreos, Kostas Zoumpatianos, Manos Athanassoulis, Niv Dayan, Brian Hentscshel, Michael S. Kester, Demi Guo, Lukas Maas, Wilson Qin, Abdul Wasay, Yiyou Sun. **IEEE DEBull 2018**

SHORT PAPERS & DEMOS

Coconut Palm: Static and Streaming Data Series Exploration Now in your Palm. Haridimos Kondylakis, Niv Dayan, Kostas Zoumpatianos, Themis Palpanas. **SIGMOD 2019**

Past and Future Steps for Adaptive Storage Data Systems: From Shallow to Deep Adaptivity. Stratos Idreos, Manos Athanassoulis, Niv Dayan, Demi Guo, Mike S. Kester, Lukas Maas, Kostas Zoumpatianos. **BIRTE 2016**

EagleTree: Exploring the Design Space of SSD-Based Algorithms. Niv Dayan, Martin Kjaer Svendsen, Matias Bjoerling, Philippe Bonnet, Luc Bouganim. **PVLDB 2013**

The Necessary Death of the Block Device Interface. Matias Bjoerling, Philippe Bonnet, Luc Bouganim, Niv Dayan. **CIDR 2013**

TUTORIALS

Beyond Bloom: A Tutorial on Future Feature-Rich Filters. Prashant Pandey, Martín Farach-Colton, Niv Dayan, Huanchen Zhang. **SIGMOD 2024**

The LSM Design Space and its Read Optimizations. Subhadeep Sarkar, Niv Dayan, Manos Athanassoulis. **ICDE 2023**

AWARDS

2025 VLDB Best Paper Award for our Paper Diva: Dynamic Range Filter for Var-Length Keys and Queries.

2024 ACM SIGMOD Distinguished Program Committee Member Award.

2024 EDBT Distinguished Program Committee Member Award.

2024 ACM SIGMOD Best Artifact Award. Our paper "InfiniFilter: Expanding Filters to Infinity and Beyond' was selected as the most reproducible paper in the ACM SIGMOD conference on the Management of Data.

2017 Best of ACM SIGMOD. Our paper on "Monkey: Optimal Navigable Key-value Store" was selected as one of the four best papers of the ACM SIGMOD Conference on the Management of Data.

2017 ACM SIGMOD Most Reproducible Paper Award. Our paper "Data Canopy: Accelerating Exploratory Statistical Analysis" was selected as the most reproducible paper in the ACM SIGMOD conference on the Management of Data.

PATENTS

2023 Updating a Log Structured Merge Tree

2021 Systems and methods for accelerating exploratory statistical analysis.

2020 Managing LSM-Tree Of Key-Value Pairs That Is Stored In a Non-volatile Memory.

2019 Log-Structured Merge-Bush.

2019 Key-Value Stores With Optimized Merge Policies And Optimized LSM-Tree Structures.

2017 Solid-State Storage Device Flash Translation Layer.

PEER REVIEWING

2026 Research Highlights Chair (ICDE)

2026 Reviewer in Conference on Innovative Data Systems Research (CIDR)

2026 Associate Editor in International Conference on Very Large Databases (VLDB) - Research Track

2026 Reviewer in ACM SIGMOD International Conference on Management of Data - Research Track

2025 Reviewer in ACM International Systems and Storage Conference (SYSTOR)

2025 Associate Editor in International Conference on Very Large Databases (VLDB) - Research Track

2025 Research Area Chair in IEEE International Conference on Data Engineering (ICDE)

2025 Reviewer in ACM SIGMOD International Conference on Management of Data - Research Track

2025 Reviewer in Extending Database Technology (EDBT) - Research Track

2025 Reviewer in Conference on Innovative Data Systems Research (CIDR)

2024 Reviewer in ACM SIGMOD International Conference on Management of Data - Research Track

2024 Reviewer in Conference on Innovative Data Systems Research (CIDR)

2024 Reviewer in IEEE International Conference on Data Engineering (ICDE) - Industry and Applications track

2024 Reviewer in ACM International Systems and Storage Conference (SYSTOR)

2023 Reviewer in Workshop on Serverless Data Analytics in VLDB.

2023 Reproducibility Reviewer in ACM SIGMOD International Conference on Management of Data

2023 Reviewer in IEEE International Conference on Data Engineering (ICDE) - Industry and Applications track

2022 Reviewer in ACM SIGMOD International Conference on Management of Data - Research Track

2021 Reviewer in ACM SIGMOD International Conference on Management of Data - Research Track

2020 Reviewer in International Conference on Very Large Databases (VLDB) - Research Track

UNIVERSITY TEACHING

University of Toronto 2024	Instructor for Advanced Databases (CSC2525)
University of Toronto 2023 - 2024	Instructor for Database System Technology (CSC443)
Harvard 2017 -2019	TA in undergraduate data systems (CS165)
Harvard 2016 - 2018	TA in graduate data science (AC297r)
IT University of Copenhagen 2014	TA in graduate database tuning
University of Dundee 2009	TA in undergraduate data structures

COMMUNITY BUILDING

System Savvy, University of Toronto, 2024	Participated in a mentorship program to encourage undergraduate women to pursue graduate studies in computer science
Graduate Metaskills Committee Member, University of Toronto, 2023-2024	Facilitated workshops for graduate students to acquire broader skills (e.g., public speaking, reviewing, etc.)
Distinguished Lecture Series Coordinator, University of Toronto, 2023-2025	Invited and organized lectures by distinguished researchers to the department
School of Cities, University of Toronto, 2023-2024	Committee member in application development competition on fostering youth engagement in cities
African Refugee Development Center, Tel Aviv, 2020-2021	Mentor in Full Stack Development & Python

INVITED RESEARCH TALKS

2025	IBM DB2 Team · Microsoft Database Group · AMD · Bytedance
2024	Salesforce · Speedb Webinar · CockroachDB · Microsoft CosmoDB · ETH Zurich · University of Copenhagen
2023	Ontario Database Day · Pinecone · Algorithmic Research-Cooperation around Oresund (ARCO) · Webinar for Speedb · Workshop on Filter Data Structures in SPAA · Research talk at Speedb · Pliops
2022	Harvard · Columbia · Cornell · IT University of Copenhagen · Oxford · University of Toronto · University of California Santa Barbara · Imperial College London · Speedb · ScyllaDB · University of Copenhagen · BARC Copenhagen · Samsung Copenhagen · Danish Technical University
2021	Tel Aviv University · IT University of Copenhagen
2020	Imperial College London
2019	Technion · Hebrew University of Jerusalem · IBM Research Israel · Yahoo Research Israel · University of Haifa · University of Washington · Microsoft Research Redmond · Boston University
2018	NetApp Boston · Facebook Palo Alto · Vertica · University of Chicago · University of Wisconsin
2017	NetApp Boston · Facebook Boston · Vertica · Tufts University · University of Dresden · IACS Computefest Harvard
2016	IACS Computefest Harvard