

Curriculum Vitae

Niv Dayan

Personal Information

NAME AND TITLE:

Niv Dayan

ADDRESS:

Computer Science
Bahen Centre for Information Technology
40 St George St
Toronto, ON M5S 2E4

 **Tel:** 437-410-7707

 **Email:** niv.dayan@utoronto.ca

 **Website:** <https://www.nivdayan.net/>

Academic Qualifications

2015	PhD	Computer Science	IT University of Copenhagen
2012	MSc	Software Development and Technology	IT University of Copenhagen
2009	BSc	Applied Computing and Financial Economics	University of Dundee

Employment

2023 – now	Assistant Professor	Computer Science	University of Toronto
2019 – 2022	Research Scientist	Algorithm Engineering	Pliops
2023 – 2024	Technical Advisor	Advisory Board	Speedb
2015 – 2019	Postdoc	Computer Science	Harvard

Research Interests

Database systems, data structures, computer storage

Research Grants

NCERC: *Universal Filters for Storage Engines*. Discovery Grant, PI — Niv Dayan (2023-2028, \$230000 CAD)

NCERC: *Universal Filters for Storage Engines*. Discovery Launch Supplement, PI — Niv Dayan (2023-2028, \$12,500 CAD)

CFI: *Universal Filters for Storage Engines*. John R. Evans Leaders Fund, PI — Niv Dayan (2023-2028, \$112,800 CAD)

ORF: *Universal Filters for Storage Engines*. John R. Evans Leaders Fund, PI — Niv Dayan (2023-2028, \$112,800 CAD)

AMD Gift: Heterogeneous accelerated computing in AI., Niv Dayan, Nandita Vijaykumar, Eyal de Lara (2025, \$75,000 USD)

Connaught Fund: Scaling Compression in Storage Engines, Connaught New Researcher Award, PI – Niv Dayan (2025, 30,000 CAD)

Honours and Awards

2026	“Best of SIGMOD” selection	ACM TODS
2026	Honorable Mention for Best Paper	SIGMOD
2026	Distinguished Reviewer Award	ACM SIGMOD
2026	Honorable Mention for Best Artifact	ACM SIGMOD
2026	Research Highlight Award	SIGMOD Record
2025	“Best of VLDB” selection	VLDB Journal
2025	VLDB Best Paper Award	VLDB Endowment
2025	Distinguished Reviewer Award	EDBT Association
2024	Distinguished Reviewer Award	ACM SIGMOD
2024	Best Artifact Award	ACM SIGMOD
2021	Distinguished Reviewer Award	ACM SIGMOD
2018	Best Artifact Award	ACM SIGMOD
2017	“Best of SIGMOD” selection	ACM TODS

Scholarly Output

Refereed

Total: 28 (2016-2026), (h-index=20, i10-index=26, citations count > 1826)

Refereed Full Research Conference & Journal Papers

2026

Dynamic Range Filtering Beyond Worst-Case Bounds. Navid Eslami, Ioana O. Bercea, Niv Dayan. ACM SIGMOD Record 2026.

Sublime: Sublinear Error & Space for Unbounded Skewed Streams Navid Eslami, Ioana O. Bercea, Rasmus Pagh, Niv Dayan. ACM SIGMOD International Conference on Management of Data. 2026.

Zeno Filter: To Infinity in Tiny Steps Hyuhng Min Kim, Navid Eslami, Niv Dayan. ACM SIGMOD International Conference on Management of Data. 2026.

Aeris Filter: A Strongly and Monotonically Adaptive Range Filter Yuvaraj Chesetti, Navid Eslami, Huanchen Zhang, Niv Dayan, Prashant Pandey. ACM SIGMOD International Conference on Management of Data. 2026.

2025

Diva: Dynamic Range Filter for Var-Length Keys and Queries Navid Eslami, Ioana O. Bercea, Niv Dayan. Proceedings of the Very Large Databases Endowment (VLDB). 2025.

Sphinx: A Succinct Perfect Hash Index for x86 Sajad Faghfoor Maghrebi, Niv Dayan. Proceedings of the Very Large Databases Endowment (VLDB). 2025.

Memento Filter: A Fast, Dynamic, and Robust Range Filter. Navid Eslami, Niv Dayan. ACM SIGMOD International Conference on Management of Data. 2025.

2024

Aleph Filter: To Infinity in Constant Time. Niv Dayan, Ioana Bercea, Rasmus Pagh. International Conference on Very Large Data Bases. 2024.

On the Security of Quotient Filters: Attacks and Potential Countermeasures. Pedro Reviriego, Miguel González, Niv Dayan, Gabriel Huecas, Shanshan Liu, Fabrizio Lombardi. IEEE Transactions on Computers, 2024.

2023

InfiniFilter: Expanding Filters to Infinity and Beyond. Niv Dayan, Ioana Bercea, Pedro Reviriego, Rasmus Pagh. In Proceedings of the ACM SIGMOD International Conference on Management of Data. 2023.

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. IEEE/ACM Transactions on Networking, 2024.

2022

Spooky: Granulating LSM-Tree Compactions Correctly. Niv Dayan, Tamar Weiss, Shmuel Dashevsky, Michael Pan, Edward Bortnikov, Moshe Twitto. In Proceedings of the Very Large Databases Endowment (VLDB). 2022.

2021

Chucky: A Succinct Cuckoo Filter for LSM-Tree. Niv Dayan, Moshe Twitto. In Proceedings of the ACM SIGMOD International Conference on Management of Data, 2021.

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. In Proceedings of the Very Large Databases Endowment (VLDB), 2021. Industry Track.

2020

Rosetta: A Robust Space-Time Optimized Range Filter for Key-Value Stores. Siqiang Luo, Subarna Chatterjee, Rafael Ketsetsidis, Niv Dayan, Wilson Qin, Stratos Idreos. In Proceedings of the ACM SIGMOD International Conference on Management of Data, 2020.

2019

Coconut: Sortable Summarizations for Scalable Indexes over Static and Streaming Data Series. Haridimos Kondylakis, Niv Dayan, Kostas Zoumpatianos, Themis Palpanas. The International Journal on Very Large Databases, 2019.

The Log-Structured Merge-Bush & the Wacky Continuum. Niv Dayan, Stratos Idreos. In Proceedings of the ACM SIGMOD International Conference on Management of Data, 2019.

2018

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

Coconut: A Scalable Bottom-Up Approach for Building Data Series Indexes. Haridimos Kondylakis, Niv Dayan, Kostas Zoumpatianos, Themis Palpanas. In Proceedings of the Very Large Databases Endowment (VLDB), 2018.

Dostoevsky: Better Space-Time Trade-Offs for LSM-Tree Based Key-Value Stores via Adaptive Removal of Superfluous Merging. Niv Dayan, Stratos Idreos. In Proceedings of the ACM SIGMOD International Conference on Management of Data, 2018.

2017

Monkey: Optimal Navigable Key-Value Store. Niv Dayan, Manos Athanassoulis, Stratos Idreos. In Proceedings of the ACM SIGMOD International Conference on Management of Data, 2017.

Data Canopy: Accelerating Exploratory Statistical Analysis. Abdul Wasay, Xinding Wei, Niv Dayan, Stratos Idreos. In Proceedings of the ACM SIGMOD International Conference on Management of Data, 2017.

2016

GeckoFTL: Scalable Flash Translation Techniques For Very Large Flash Devices. Niv Dayan, Phillippe Bonnet, Stratos Idreos. In Proceedings of the ACM SIGMOD International Conference on Management of Data, 2016.

Tutorials

2024

Beyond Bloom: A Tutorial on Future Feature-Rich Filters. Prashant Pandey, Martin Farach-Colton, Niv Dayan, Huanchen Zhang. Tutorial at ACM SIGMOD International Conference on Management of Data, 2024.

2023

The LSM Design Space and its Read Optimizations. Subhadeep Sarkar, Niv Dayan, Manos Athanassoulis. In Proceedings of the IEEE International Conference on Data Engineering, 2023.

Short Papers & Demos

2024

Wayfinder: Speeding up Key-Value Separation by Avoiding I/O Based Indirection. Guy Khazma, Myles Thiessen, Eyal de Lara, Niv Dayan. SiMOD Workshop on Simplicity in Data Management. 2024.

2019

Coconut Palm: Static and Streaming Data Series Exploration Now in your Palm. Haridimos Kondylakis, Niv Dayan, Kostas Zoumpatianos, Themis Palpanas. In Proceedings of the ACM SIGMOD International Conference on Management of Data, 2019. Volume 28.

2013

EagleTree: Exploring the Design Space of SSD-Based Algorithms. Niv Dayan, Martin Kjaer Svendsen, Matias Bjoerling, Philippe Bonnet, Luc Bouganim. In Proceedings of the Very Large Databases Endowment (VLDB), 2013.

The Necessary Death of the Block Device Interface. Matias Bjoerling, Philippe Bon-net, Luc Bouganim, Niv Dayan. In Proceedings of CIDR Conference on Innovative Data Systems Research, 2013.

Non Refereed

Total: 3 (2015 - 2019)

Journals

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, Yiyu Sun. IEEE Data Engineering Bulletin (IEEE DEBull), 2019.

2018

The Periodic Table of Data Structures. Stratos Idreos, Kostas Zoumpatianos, Manos Athanassoulis, Niv Dayan, Brian Hentschel, Michael S. Kester, Demi Guo, Lukas Maas, Wilson Qin, Abdul Wasay, Yiyu Sun. IEEE Data Engineering Bulletin (IEEE DEBull), 2018.

2015

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. International Workshop on Business Intelligence for the Real-Time Enterprise. 2015

Patents

2025

Managing LSM-Tree of Key-Value Pairs stored in Non-volatile Memory. Niv Dayan, Moshe Twitto. 2025. US Patent.

2024

Separated Database Management. Guy Guetta, Edward Bortnikov, Michael Pan, Moshe Twitto, Tamar Weiss, Shmuel Dashevsky, Niv Dayan. 2024. US Patent.

2023

Updating a Log Structured Merge Tree. Niv Dayan, Edward Bortnikov, Moshe Twitto. 2023. US Patent.

Systems and methods for accelerating exploratory statistical analysis. Stratos Idreos, Wasay Abdul, Niv Dayan. 2023. US Patent.

2021

Key-Value Stores with Optimized Merge Policies and Optimized LSM-Tree Structures. Stratos Idreos, Niv Dayan. 2021. US Patent.

2019

File management with log-structured merge bush. Niv Dayan, Stratos Idreos. 2019. US Patent.

2017

Solid-State Storage Device Flash Translation Layer. Philippe Bonnet, Niv Dayan. 2017. US Patent.

Presentations

2025

- | | |
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| • IBM's DB2 Team | Memento Filter & Diva |
| • VastData | Scaling Storage Engines |
| • AMD Tech Talk | Scaling Storage Engines |
| • Microsoft Research | Memento Filter & Diva |
| • Salesforce | Memento Filter & Diva |
| • TU Nuremberg, TU Darmstadt, HPI Potsdam | Expandable Filters |
| • SYSTOR Keynote | Scaling Storage Engines |

2024

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| • Salesforce | Scaling Storage Engines Part 2 |
| • Salesforce | Scaling Storage Engines Part 1 |
| • Speedb Webinar | The Rise of LSM-Trees, Why Now? |
| • CockroachDB | Scaling Storage Engines |
| • Microsoft's CosmoDB | Scaling Storage Engines |
| • ETH Zurich | Expandable Filters |

2023

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| • Columbia University | Scaling Storage Engines |
| • Pinecone | Scaling Storage Engines |
| • Algorithmic Research-Cooperation Oresund (ARCO) | Expandable Filters |
| • Speedb | Scaling Storage Engines |
| • Pliops | Expandable Filters |

2022

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| • Harvard Data Systems Lab | Scaling Storage Engines |
| • Columbia DB Group | Scaling Storage Engines |
| • Cornell | Scaling Storage Engines |
| • IT University of Copenhagen | Scaling Storage Engines |
| • Oxford | Scaling Storage Engines |
| • University of Toronto | Scaling Storage Engines |
| • University of California Santa Barbara | Scaling Storage Engines |
| • Imperial College London | Scaling Storage Engines |
| • ScyllaDB | Scaling Storage Engines |
| • University of Copenhagen | Scaling Storage Engines |
| • BARC Copenhagen | Scaling Storage Engines |
| • Samsung Copenhagen | Scaling Storage Engines |
| • Danish Technical University | Scaling Storage Engines |

2021

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| • Tel Aviv University | Scaling Storage Engines |
| • IT University of Copenhagen | Scaling Storage Engines |

2020

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| • Imperial College London | Scaling Storage Engines |
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2019

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| • Technion | Scaling Storage Engines |
| • Hebrew University of Jerusalem | Scaling Storage Engines |
| • IBM Research Israel | Scaling Storage Engines |
| • Yahoo Research Israel | Scaling Storage Engines |
| • University of Haifa | Scaling Storage Engines |
| • University of Washington | Scaling Storage Engines |
| • Microsoft Research Redmond | Scaling Storage Engines |
| • Boston University | Scaling Storage Engines |

2018

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| • NetApp Boston | Scaling Storage Engines |
| • Facebook Palo Alto | Scaling Storage Engines |

- Vertica 6639
- University of Chicago 6639
- University of Wisconsin 6639

2017

- NetApp Boston 6639
- Facebook Boston 6639
- Vertica 6639
- Tufts University 6639
- University of Dresden 6639
- IACS Computefest Harvard 6639

2016

- IACS Computefest Harvard. 6639

Teaching Experience

Undergraduate

University of Toronto:

Database System Technology, CSC443H1 (2025, Fall);
 Database System Technology, CSC443H1 (2024, Fall);
 Database System Technology, CSC443H1 (2023, Fall);
 Database System Technology, CSC443H1 (2023, Winter);

Graduate

University of Toronto:

Research Topics in Database Management, CSC2525H (2026, winter);
 Research Topics in Database Management, CSC2525H (2025, winter);
 Research Topics in Database Management, CSC2525H (2024, winter)

Supervisory Experience

The default is U of T. If you have previous or external supervisions, please include the institution.

Graduate Student Supervision

Primary/Co-Advisor: PhD Students

2024 – current	Primary	Hyuhng Min Kim
2023 – current	Primary	Navid Eslami

2023 – current	Primary	Sajad Maghrebi
2023 – current	Co-Advisor	Guy Khazma

Primary/Co-Advisor: Master's Students

2025 – current	Co-Advisor	Victor Pineda
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Graduate Student Supervisory Committees

2024 – current	Kaiwen Chen
2025 – current	Michail Bachras
2024 – current	Jason Hu
2024 – 2025	Akshay Bapat
2023 – 2024	Jiacheng Yang

Defense Committee Member

2025	Andrea Guerra	University of Pisa TU Munich
2025	Gabriel Haas	
2025	Jeremy Ko	
2025	Seyed Ali Jokar Jandaghi	
2024	Ioannis Xarchakos	

Committee Member: Master's Students

2024	Sahar Eslami
2024	Ray Zhang

MScAC Internship Supervision

2024-2025	Shijia Liu
2023-2024	Duy Tran,
2023-2024	Haoteng Wang

Undergraduate Student Research Supervision

2026 Computer Science Project (CSC494): Pranjali Agrawal, Sasha Kovalev, Andrew Sasmito, Lantian Zhang

2025 Computer Science Project (CSC494): Andrew ., Camilla Xue, David Adler, Nuan Wen, Jackson Connors

Voluntary Research in Lab Projects

HongCheng Wong	MScAC
Kyle Kim	M.Eng
Vijay Sambamurthy	BSc
Dechen Han	MScAC
Xuhui Chen	MScAC

Professional Service

2026	Lightning Talks Track Chair	ICDE Conference
2026	Program committee	CIDR Conference
2026	Program committee	SIGMOD Conference
2026	Associate Editor	VLDB Conference
2026	Program committee	SYSTOR Conference
2025	Associate Editor	VLDB Conference
2025	Program committee	CIDR Conference
2025	Program committee	SIGMOD Conference
2025	Program committee	EDBT Conference
2025	Area Chair	ICDE Conference
2024	Program committee	SYSTOR Conference
2024	Program committee	CIDR Conference
2024	Program committee	SIGMOD Conference
2024	Program committee	Workshop on Analytics in VLDB
2023	Reproducibility Reviewer	SIGMOD
2023	Program committee	ICDE Conference Industry Track
2022	Program committee	SIGMOD Conference
2021	Program committee	SIGMOD Conference
2020	Program committee	VLDB Conference

University Service

2023 – current	Distinguished Lecture Series Coordinator	Computer Science
2023 – current	POC Hiring & Liaison for Sysnet Group	Computer Science
2024	Refurbishment Coordinator for Sysnet Space	Computer Science
2025	Coordinator of Applied AI Colloquium	Computer Science
2023 – 2024	Grad Metaskills Committee Member	Computer Science