

Niv Dayan

Curriculum Vitae



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born: 1 Feb 1989

EDUCATION & RESEARCH EMPLOYMENT

Assistant Professor, University of Toronto, Canada	2023 - ...
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

REFERRED CONFERENCE & JOURNAL PUBLICATIONS

- 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, 2022. **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. In Proceedings of the Very Large Databases Endowment, 2021. Industry Track. **PVLDB 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. **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. In Proceedings of the ACM SIGMOD International Conference on Management of Data, 2020. **SIGMOD 2020**
- 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. **SIGMOD 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 Bull, 2019. **IEEE DEBull 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. Proceedings of CIDR Conference on Innovative Data Systems Research, 2019. **CIDR 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. **VLDBJ 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 Hentschshel, Michael S. Kester, Demi Guo, Lukas Maas, Wilson Qin, Abdul Wasay, Yiyu Sun. IEEE Data Engineering Bull. Sep, 2018	IEEE DEBull 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.	SIGMOD 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, 2018.	PVLDB 2018
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. Best of SIGMOD Award.	SIGMOD 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.	SIGMOD 2017
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.	SIGMOD 2016

REFEREED SHORT PAPERS

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.	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. In Proceedings of the International Workshop on Business Intelligence for Real-Time Enterprises, 2016.	BIRTE 2016
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, 2013.	PVLDB 2013
The Necessary Death of the Block Device Interface. Matias Bjoerling, Philippe Bonnet, Luc Bouganim, Niv Dayan. In Proceedings of CIDR Conference on Innovative Data Systems Research, 2013.	CIDR 2013

AWARDS

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

- 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.

Reviewing

- 2023 PC in IEEE International Conference on Data Engineering (ICDE) - Industry and Applications track
- 2022 PC in ACM SIGMOD International Conference on Management of Data - Research Track
- 2021 PC in ACM SIGMOD International Conference on Management of Data - Research Track
- 2020 PC in International Conference on Very Large Databases (VLDB) - Research Track
- External: JDS 2022 · VLDBJ 2022 · TKDE 2022 · TECS 2021 · VLDBJ 2021 · TKDE 2020 · TKDE 2018 · VLDB 2016

STUDENT SUPERVISION

- 2020 Advised a PhD intern on a project on learned indexes for LSM-tree.
- 2019 Advised a bachelors thesis on range filtering for LSM-tree, which led to a SIGMOD 2020 publication.
- 2017 Advised a PhD project on statistical query acceleration, which led to a SIGMOD 2017 publication.
- 2016 Advised a masters thesis on similarity search in astronomy.
- 2013 Managed a research assistant on building and extending an SSD simulator.

INVITED RESEARCH TALKS

- 2022 Harvard · Columbia · Cornell · IT University of Copenhagen · Oxford · University of Toronto · University of California Santa Barbara · Imperial College London · University of Copenhagen
- 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

COMMUNITY OUTREACH

- African Refugee Development Center, Tel Aviv, 2021 Mentor in Full Stack Development
- African Refugee Development Center, Tel Aviv, 2020 Mentor on Introduction to Python

UNIVERSITY TEACHING

- Harvard 2019 TA in undergraduate data systems (CS165)
- Harvard 2018 TA in graduate data science (AC297r)
- Harvard 2017 TA in undergraduate data systems (CS165)
- Harvard 2017 TA in graduate data science (AC297r)
- Harvard 2016 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