Eleni Tzirita Zacharatou
Curriculum Vitae

Assistant Professor, IT University of Copenhagen
Rued Langgaards Vej 7, 2300 Copenhagen, Denmark
elza@itu.dk | ORCID 0000-0001-8873-5455 | heltzi.github.io

Education

Ph.D. in Computer Science   2013 − 2019
École Polytechnique Fédérale de Lausanne (EPFL), Switzerland
Thesis: Efficient Query Processing for Spatial and Temporal Data Exploration
Advisor: Prof. Anastasia Ailamaki

Diploma (M. Eng.) in Electrical & Computer Engineering   2007 − 2013
National Technical University of Athens (NTUA), Greece
Thesis: Automatic Music Transcription
Advisor: Prof. Petros Maragos

Academic Experience

IT University of Copenhagen (ITU)   Copenhagen, Denmark
Assistant Professor, Computer Science Department   May 2022 − now
- Member of the Data-Intensive Systems and Applications (DASYA) group
- Research Focus: Spatial Big Data Analytics

Technical University of Berlin (TUB)   Berlin, Germany
Postdoctoral Researcher, Computer Science Department   Oct 2019 − Apr 2022
- Member of the Database Systems and Information Management (DIMA) group
- Junior Fellow at BIFOLD
- Supervisor: Prof. Volker Markl

New York University (NYU)   New York, USA
Visiting Researcher, Tandon School of Engineering   Jul 2016 − Oct 2016
- Member of the Visualization, Imaging and Data Analysis (VIDA) group
- Supervisors: Prof. Juliana Freire and Dr. Harish Doraiswamy

École Polytechnique Fédérale de Lausanne (EPFL)   Lausanne, Switzerland
Doctoral Assistant, Computer Science Department   Sep 2013 − Aug 2019
- Member of the Data-Intensive Applications and Systems (DIAS) group
- Research Focus: Spatial and temporal data management for exploratory applications
- Advisor: Prof. Anastasia Ailamaki

École Polytechnique Fédérale de Lausanne (EPFL)   Lausanne, Switzerland
Research Intern, Computer Science Department   Jan 2013 − Aug 2013
- Member of the Data-Intensive Applications and Systems (DIAS) group
- Supervisors: Prof. Anastasia Ailamaki and Prof. Thomas Heinis

Honors and Awards

- Distinguished Reviewer Award, VLDB Conference — 2022
- Junior Fellowship, Berlin Institute for the Foundation of Learning and Data (BIFOLD) — 2021
- Best Demonstration Award, ACM SIGMOD Conference — 2018
- Travel Award, ExploreDB Workshop (in conjunction with ACM SIGMOD), USD 1K — 2016
- Distinction in the Panhellenic Math Competition "Euclid", Hellenic Mathematical Society — 2006

Publications Summary

Full papers at top-tier conferences (CORE A*/A ranking) and journals: 11
Other peer-reviewed conference papers: 3
Peer-reviewed workshop and demonstration papers: 9
Papers under submission: 4
Number of citations: 310 and h-index: 10 (as per Google Scholar in April 2024)
Full list of publications: see https://heltzi.github.io/publications.html

Invited Talks, Panels, and Conference Presentations

- 08/2024: VLDB PhD Workshop Panel, Guangzhou, China (Invited Panelist)
- 07/2024: VLDB Summer School 2024, Cluj-Napoca, Romania (Invited Speaker)
- 07/2024: BIFOLD Lunch Talk, Berlin, Germany (Invited Speaker)
- 11/2023: Efficient Data Management for Modern Spatial Applications, HPI-TU Darmstadt Joint Database Systems Seminar, Online
- 09/2023: Efficient Data Management for Modern Spatial Applications, NERDS (ITU) Seminar, Denmark
- 09/2022: Efficient Data Management for Modern Spatial Applications and the Internet of Moving Things, DIREC Seminar, Aarhus, Denmark
- 05/2022: Spatial and Temporal Data Management Panel, ICDE Conference, Online
- 09/2021: Agora-EO: A Unified Ecosystem for Earth Observation, Monthly Research Meeting, Department of Geo-information Processing, University of Twente, Online
- 08/2021: Spatio-Temporal Data System Panel, VLDB Conference, Online
- 01/2021: The Case for Distance-Bounded Spatial Approximations, CIDR Conference, Online
- 11/2019: Efficient Bundled Spatial Range Queries, SIGSPATIAL Conference, Chicago, USA
- 08/2019: Efficient Query Processing for Spatial and Temporal Data Exploration, Public Defense, EPFL, Lausanne, Switzerland
- 07/2019: GPU Rasterization for Real-Time Spatial Aggregation over Arbitrary Polygons, Hellenic Data Management Symposium (HDMS), Athens, Greece
- 02/2019: Interactive and Exploratory Spatio-Temporal Data Analytics, DIMA Research Seminar, TU Berlin, Germany
- 08/2018: GPU Rasterization for Real-Time Spatial Aggregation over Arbitrary Polygons, VLDB Conference, Rio de Janeiro, Brazil
- 06/2018: Interactive Exploration of Urban Data with GPUs, Short Presentation, IC Research Day, EPFL, Lausanne, Switzerland
- 04/2018: Improving Spatial Data Processing by Clipping Minimum Bounding Boxes, ICDE Conference, Paris, France
- 06/2017: Real-Time Spatial Aggregation using GPU Rasterization, EcoCloud Annual Event, Lausanne, Switzerland
- 09/2016: Indexing the brain, Data Science Lunch Talk, NYU Center for Data Science, New York, USA
- 06/2015: RUBIK: Efficient Threshold Queries on Massive Time Series, SSDBM Conference, San Diego, USA

Advising (Current)

- *Xenofon Chatziliadis*, PhD, TUB, Primary advisor: Prof. Volker Markl   Fall 2019 − now
- *Gereon Dusella*, PhD, TUB, Primary advisor: Prof. Volker Markl   Fall 2023 − now
- *Aske Wachs*, MSc Research Project & Thesis, ITU   Fall 2023 − now
- *Johan Kjersgård Flensmark, Benjamin Hammer Thygesen, Alexander Theodor Bilde Pedersen*, MSc Research Project & Thesis, ITU   Fall 2023 − now
- *Barbara Puljak*, MSc Research Project & Thesis, ITU   Fall 2023 − now

Advising (Alumni)

- *Martin Kiefer*, PhD, TUB, Primary advisor: Prof. Volker Markl   Fall 2021 − Fall 2022
- *Dagmara Kamila Przygocka, Kamila Garczynska, Barbara Puljak*, MSc Research Project, ITU   Fall 2023
- *Hanno Skowronek*, MSc Thesis, TUB, Primary advisor: Prof. Begüm Demir   Spring 2023
- *Carl Bruun & Rasmus Garbarsch*, BSc Thesis, ITU   Spring 2023
- *Gergo Gyori*, BSc Thesis, ITU   Spring 2023
- *Gereon Dusella*, MSc Thesis, TUB, Co-supervisor: H. Gavriilidis   Spring 2023
- *Peter Løffmann, Thomas Haugaard Mogensen, Zachery Kuntz*, MSc Research Project, ITU   Fall 2022
- *Laert Nuhu*, MSc Thesis, TUB, Co-supervisor: H. Gavriilidis   Spring 2022
- *Pablo Alberto Osinaga Arze*, MSc Thesis, TUB   Fall 2021
- *Iva Mihajlovska*, MSc Thesis, TUB   Spring 2021
- *Marcellus Prama Saputra*, BSc Thesis, TUB   Spring 2021
- *Robin Papke*, MSc Thesis, TUB   Fall 2020
- *Elena Beatriz Ouro Paz*, MSc Thesis, TUB   Spring 2020
- *Carlos E. Muniz Cuza*, MSc Thesis, TUB & Aalborg University,   Spring 2020
  Co-supervisors: Professors Nguyen Thi Thao Ho, Torben Bach Pedersen, Bin Yang
- *Vlad Mihaescu*, MSc Research Project, EPFL   Fall 2018
- *Maria Ilina*, Summer Intern, EPFL   Summer 2018
- *Parand Alizadeh*, Summer Intern, EPFL   Summer 2018
- *Chenxi Sun*, Summer Intern, EPFL   Summer 2015

Guided Research

- *Thanasis Georgiadis*, Approximating Polygons as Raster Interval Lists   Spring 2023
- *David Burell*, Workload Prediction for IoT Data Management Systems   Fall 2022
- *Felix Henze*, Efficient Specialized Spreadsheet Parsing   Spring 2022
- *Ahmet Kerem Aksoy*, Satellite Image Search in AgoraEO   Spring 2022
- *Christian Winter*, A Query-Cache Accelerated Data Structure   Fall 2021
  for Spatial Aggregation over Polygons

Other Mentoring Activities

- Mentor in the AI Grid network   2023 − now

PhD Thesis Committees

- Keven Richly, PhD, HPI (Advisor: Hasso Plattner)   2024
- Martin Kiefer, PhD, TU Berlin (Advisor: Volker Markl)   2023
- Morten Tychsen Clausen, PhD Midway, ITU (Advisor: Philippe Bonnet)   2023

Teaching

Term	Institute	Course Name	Role
Spring 2024, Fall 2023, Fall 2022	ITU	Introduction to Database Systems	Course Manager & Responsible Lecturer
Fall 2021, Spring 2021	TUB	DBPRA: Datenbankpraktikum (Practical course on databases)	Responsible Lecturer
Fall 2020	TUB	AIM-3: Scalable Data Analysis and Data Mining	Lecturer
Fall 2020, Spring 2020, Fall 2019	TUB	BDASEM: Big Data Analytics Seminar	Lecturer
Spring 2020	TUB	BDAPRO: Big Data Analytics Project	Project Mentor
Fall 2019	TUB	DBSEM: Foundations of Database Systems Seminar	Lecturer
Fall 2018/2019, Spring 2014	EPFL	Information, Computation, Communication	Teaching Assistant
Spring 2018, Spring 2017	EPFL	Database Systems	Teaching Assistant
Fall 2017/2018	EPFL	Programming I (in C)	Teaching Assistant
Spring 2016	EPFL	Probability and Statistics	Teaching Assistant
Fall 2015/2016	EPFL	Computer Architecture	Teaching Assistant
Spring 2015	EPFL	Introduction to Database Systems	Teaching Assistant
Fall 2014/2015	EPFL	Introduction to Object Oriented Programming (in Java)	Teaching Assistant

Service

Organization:
- Proceedings Co-chair, SIGMOD 2025
- Diversity and Inclusion Co-chair, EDBT 2025
- Proceedings Chair, DEBS 2022
- Co-chair, BOSS Workshop 2020 (in conjunction with VLDB)

Program Committee:
- ACM SIGMOD: 2025, 2024, 2023, 2022, 2021 (Industrial track)
- VLDB: 2025, 2023, 2022
- IEEE ICDE: 2024 (Demo track)
- EDBT: 2022
- VLDB PhD Workshop: 2023
- BTW: 2023 (Demo track)
- ACM SIGSPATIAL Workshop on Location-based Recommendations, Geosocial Networks and Geoadvertising (LocalRec): 2023

- PLDI Workshop on Distributions, Relational Algebra, Graphs, Semi-Rings, Tensors, and All That (DRAGSTERS): 2023
- IEEE Intl. Conf. on Cloud Engineering Workshop on Testing Distributed Internet of Things Systems (TDIS): 2022
- AI-ML Systems: 2021
- CIKM: 2018 (Short research papers track)

Journal Reviewer:
- VLDB Journal, 2021 − 2022
- Knowledge and Information Systems (KAIS) Journal, 2021 − 2022
- Big Data Research Journal, 2022

External Reviewer:
CIDR 2022, SIGMOD 2021, CIDR 2021, ICDE 2017

Panelist:
- Spatial and Temporal Data Management Panel, ICDE, May 2022
- Spatio-Temporal Data System Panel, VLDB, August 2021

Session Chair:
EDBT 2023, VLDB 2021, VLDB 2020

Assessment and Admission Committees:
- Committee Member: Software Design Master's Program Admission, ITU, Spring 2023
- Committee Member: Two PhD Positions, ITU, Fall 2022 and Spring 2023
- Committee Member: Professorship of "W3 Big Data Engineering", TU Berlin, 2021

Department Level:
- Co-organizer: CS Lectures Series, ITU, 2022 − now
- Co-organizer: CS Department Annual Retreat, ITU, 2023

Media, Blogs, and Interviews
- 2023: *An Interview with Eleni Tzirita Zacharatou*, DIMA TUB webpage
- 2021: *Advancing Big Data Analytics: Post-Doctoral Research*, DataTalksClub podcast
- 2021: *BIFOLD welcomes the first six junior fellows*, BIFOLD webpage
- 2021: *The Case for Distance-Bounded Spatial Approximations*, The Agora Technology Blog, Medium
- 2018: *Student-teacher Duo from EPFL Wins Best Demonstration Award at SIGMOD*, Ecocloud News
- 2018: *Tandon Team Takes Home Top Honors at Association for Computing Machinery Conference*, Tandon School of Engineering News

References
Provided upon request.

Languages
Greek (Native), English (Fluent), French (Fluent), German (Intermediate)

Extracurricular
I have formally studied the piano, the violin, and music theory. I enjoy playing music alone or in groups.
- 2010: Piano Teaching Diploma (Ptychio), Grade Excellent, Athenaeum Conservatory
- 2005: Classical Harmony Diploma (Ptychio), Heraklion Conservatory

Eleni Tzirita Zacharatou
Publications

Assistant Professor, IT University of Copenhagen

elza@itu.dk | ORCID <u>0000-0001-8873-5455</u> | <u>heltzi.github.io</u>

Metric	Value
Peer-reviewed publications	23
Citations	310
h-index	10
i10-index	10

Table 1: Summary of bibliometrics as per <u>Google Scholar</u> in April 2024.

It's important to note that the database research community is relatively small, leading to smaller indices for database researchers, as evidenced by conference indices.[1] The venue ranking according to the CORE Conference Portal[2] is included when available. My name is highlighted in **boldface** and the names of students under my (co-)mentorship are marked with an asterisk (*).

Peer-Reviewed Journal Publications

[1] X. Chatziliadis*, E. **Tzirita Zacharatou**, A. Eracar, S. Zeuch, and V. Markl. "Efficient Placement of Decomposable Aggregation Functions for Stream Processing over Large Geo-Distributed Topologies". In: *Proceedings of the Very Large Databases Endowment (PVLDB)* 17(6) (2024), pp. 1501–1514. [Core A*].

[2] H. Gavriilidis, F. Henze*, E. **Tzirita Zacharatou**, and V. Markl. "SheetReader: Efficient Specialized Spreadsheet Parsing". In: *Information Systems* 115 (2023), p. 102183. [Core A*].

[3] M. Kiefer*, I. Poulakis, E. **Tzirita Zacharatou**, and V. Markl. "Optimistic Data Parallelism for FPGA-Accelerated Sketching". In: *Proceedings of the Very Large Databases Endowment (PVLDB)* 16(5) (2023), pp. 1113–1125. [Core A*].

[4] E. **Tzirita Zacharatou**, H. Doraiswamy, A. Ailamaki, C. T. Silva, and J. Freire. "GPU Rasterization for Real-Time Spatial Aggregation over Arbitrary Polygons". In: *Proceedings of the Very Large Databases Endowment (PVLDB)* 11(3) (2017), pp. 352–365. [Core A*].

Peer-Reviewed Conference Publications

[5] C. E. Muñiz-Cuza*, N. Ho, E. **Tzirita Zacharatou**, T. B. Pedersen, and B. Yang. "Spatio-temporal graph convolutional network for stochastic traffic speed imputation". In: *International Conference on Advances in Geographic Information Systems (SIGSPATIAL)*. ACM, 2022, 14:1–14:12. [Core A].

[6] M. P. Saputra*, E. **Tzirita Zacharatou**, S. Papadias, and V. Markl. "In-Place Updates in Tree-Encoded Bitmaps". In: *International Conference on Scientific and Statistical Database Management (SSDBM)*. ACM, 2022, 18:1–18:4. [Core2021 B].

[7] E. Ouro Paz*, E. **Tzirita Zacharatou**, and V. Markl. "Towards Resilient Data Management for the Internet of Moving Things". In: *Datenbanksysteme für Business, Technologie und Web (BTW)*. Gesellschaft für Informatik e.V., 2021, pp. 279–301.

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[1] https://scholar.google.de/citations?view_op=top_venues&hl=en&vq=eng_databasesinformationsystems
[2] www.core.edu.au/conference-portal

[8] E. **Tzirita Zacharatou**, A. Kipf, I. Sabek, V. Pandey, H. Doraiswamy, and V. Markl. "The Case for Distance-Bounded Spatial Approximations". In: *Conference on Innovative Data Systems Research (CIDR)*. www.cidrdb.org, 2021. [Core A].

[9] A. de Wall, B. Deiseroth, E. **Tzirita Zacharatou**, J.-A. Quiané-Ruiz, B. Demir, and V. Markl. "Agora-EO: A Unified Ecosystem for Earth Observation - A Vision for Boosting EO Data Literacy". In: *Conference on Big Data from Space*. 2021, pp. 101–104.

[10] C. Winter*, A. Kipf, C. Anneser, E. **Tzirita Zacharatou**, T. Neumann, and A. Kemper. "GeoBlocks: A Query-Cache Accelerated Data Structure for Spatial Aggregation over Polygons". In: *International Conference on Extending Database Technology (EDBT)*. OpenProceedings.org, 2021, pp. 169–180. [Core A].

[11] A. Kipf, H. Lang, V. Pandey, R. A. Persa, C. Anneser, E. **Tzirita Zacharatou**, H. Doraiswamy, P. A. Boncz, T. Neumann, and A. Kemper. "Adaptive Main-Memory Indexing for High-Performance Point-Polygon Joins". In: *International Conference on Extending Database Technology (EDBT)*. OpenProceedings.org, 2020, pp. 347–358. [Core A].

[12] E. **Tzirita Zacharatou**, D. Sidlauskas, F. Tauheed, T. Heinis, and A. Ailamaki. "Efficient Bundled Spatial Range Queries". In: *International Conference on Advances in Geographic Information Systems (SIGSPATIAL)*. ACM, 2019, pp. 139–148. [Core A].

[13] D. Sidlauskas, S. Chester, E. **Tzirita Zacharatou**, and A. Ailamaki. "Improving Spatial Data Processing by Clipping Minimum Bounding Boxes". In: *International Conference on Data Engineering, (ICDE)*. IEEE, 2018, pp. 425–436. [Core A*].

[14] E. **Tzirita Zacharatou**, F. Tauheed, T. Heinis, and A. Ailamaki. "RUBIK: efficient threshold queries on massive time series". In: *International Conference on Scientific and Statistical Database Management (SSDBM)*. ACM, 2015, 18:1–18:12. [Core2014 A].

Peer-Reviewed Workshop and Demonstration Publications

[15] G. Dusella*, H. Gavriilidis, L. Nuhu, V. Markl, and E. **Tzirita Zacharatou**. "Multi-Backend Zonal Statistics Execution with Raven". In: *International Conference on Management of Data (SIGMOD)*. To appear. ACM, 2024. Demo paper. [Core A*].

[16] A. Wachs* and E. **Tzirita Zacharatou**. "Analysis of Geospatial Data Loading". In: *DBTest@SIGMOD '24: Proceedings of the International Workshop of Testing Database Systems*. To appear. 2024.

[17] D. Burrell*, X. Chatziliadis*, E. **Tzirita Zacharatou**, S. Zeuch, and V. Markl. "Workload Prediction for IoT Data Management Systems". In: *Datenbanksysteme für Business, Technologie und Web (BTW)*. Gesellschaft für Informatik e.V., 2023, pp. 943–950. BTW 2023 DE4DS Workshop.

[18] A. K. Aksoy*, P. Dushev, E. **Tzirita Zacharatou**, H. Hemsen, M. Charfuelan, J. A. Quiané-Ruiz, B. Demir, and V. Markl. "Satellite Image Search in AgoraEO". In: *Proceedings of the Very Large Databases Endowment (PVLDB)* 15(12) (2022), pp. 3646–3649. Demo paper. [Core A*].

[19] F. Henze*, H. Gavriilidis, E. **Tzirita Zacharatou**, and V. Markl. "Efficient Specialized Spreadsheet Parsing for Data Science". In: *International Workshop on Design, Optimization, Languages and Analytical Processing of Big Data (DOLAP (co-located with EDBT))*. CEUR-WS.org, 2022, pp. 41–50. [Core B].

[20] X. Chatziliadis*, E. **Tzirita Zacharatou**, S. Zeuch, and V. Markl. "Monitoring of Stream Processing Engines Beyond the Cloud: An Overview". In: *Open Journal of Internet Of Things (OJIOT)* 7(1) (2021), pp. 71–82. VLDB 2021 VLIoT Workshop.

[21] S. Zeuch, E. **Tzirita Zacharatou**, S. Zhang, X. Chatziliadis, A. Chaudhary, B. D. Monte, D. Giouroukis, P. M. Grulich, A. Ziehn, and V. Markl. "NebulaStream: Complex Analytics Beyond the Cloud". In: *Open Journal of Internet Of Things (OJIOT)* 6(1) (2020), pp. 66–81. VLDB 2020 VLIoT Workshop.

[22] H. Doraiswamy, E. **Tzirita Zacharatou**, F. Miranda, M. Lage, A. Ailamaki, C. T. Silva, and J. Freire. "Interactive Visual Exploration of Spatio-Temporal Urban Data Sets using Urbane". In: *International Conference on Management of Data (SIGMOD)*. ACM, 2018, pp. 1693–1696. Demo paper. [Core A*]
Best Demonstration Award.

[23] M. Pavlovic, E. **Tzirita Zacharatou**, D. Sidlauskas, T. Heinis, and A. Ailamaki. "Space odyssey: efficient exploration of scientific data". In: *International Workshop on Exploratory Search in Databases and the Web (ExploreDB (co-located with SIGMOD))*. ACM, 2016, pp. 12–18.

Articles and Technical Reports (Non-Peer-Reviewed)

[24] Z. Bao, P. Bouros, R. Cheng, B. Choi, A. Dignös, W. Ding, Y. Fang, B. Han, J. Hu, A. Khan, W. Lin, X. Lin, C. Long, N. Mamoulis, J. Pei, M. Renz, S. Shekhar, J. Shi, E. **Tzirita Zacharatou**, S. Wang, X. Wang, X. Wang, R. C.-W. Wong, D. Yan, X. Yan, B. Yang, D. Yao, C. Zhang, P. Zhao, and R. Zhu. "A Summary of ICDE 2022 Research Session Panels". In: *Data Engineering Bulletin* 47 (2023). URL: http://sites.computer.org/debull/A23dec/p4.pdf.

[25] T. Georgiadis*, E. **Tzirita Zacharatou**, and N. Mamoulis. "APRIL: Approximating Polygons as Raster Interval Lists". In: *CoRR* abs/2307.01716 (2023). DOI: 10.48550/arXiv.2307.01716. URL: https://doi.org/10.48550/arXiv.2307.01716. **Under submission to VLDBJ.**

[26] V. Pandey, A. van Renen, E. **Tzirita Zacharatou**, A. Kipf, I. Sabek, J. Ding, V. Markl, and A. Kemper. "Enhancing In-Memory Spatial Indexing with Learned Search". In: *CoRR* abs/2309.06354 (2023). DOI: 10.48550/arXiv.2309.06354. URL: https://doi.org/10.48550/arXiv.2309.06354. **Under submission to Frontiers in Big Data Journal.**

PhD Thesis

[27] E. **Tzirita Zacharatou**. "Efficient Query Processing for Spatial and Temporal Data Exploration". PhD thesis. EPFL, 2019, p. 183.

Conference Proceedings

[28] Y. Zhou, P. K. Chrysanthis, V. Gulisano, and E. **Tzirita Zacharatou**, eds. *16th ACM International Conference on Distributed and Event-based Systems, DEBS 2022, Copenhagen, Denmark, June 27 - 30, 2022*. ACM, 2022. ISBN: 978-1-4503-9308-9. DOI: 10.1145/3524860. URL: https://doi.org/10.1145/3524860. Proceedings chair.