Dimitris Tsitsigkos

Software Engineer (Ph.D)

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Summary

Software Engineer specializing in data management and high-performance computing. Experienced in the design and implementation of in-memory indexing techniques that accelerate query performance for single and multi-dimensional data. Focuses on building efficient, scalable data systems and algorithms using C++, Java, and Python. Hands-on experience with frameworks such as OpenMP and SIMD for performance optimization. Focused on solving complex data challenges through robust software engineering and algorithmic design.

Work Experience

Archimedes Research on AI, Data Science and Algorithms, Greece Feb 2025 - present

Postdoctoral Researcher

- Member of the Data Science and Engineering team, focusing on multi-dimensional and vector data.
- Designing and implementing indexing techniques to enhance query performance for multi-dimensional and vector data.

Dept. of Computer Science & Engineering, Univ. of Ioannina, Greece Jan 2024 – Dec 2024

Doctoral Researcher

Participated in the Greek funding project MESA: In-memory Spatial Analytics Made Scalable

- Implemented novel parallel and non-parallel index structures for spatial queries, including spatial join, range queries, and k-NN.
- Contributed to the design and development of a prototype distributed spatial data management framework using MPI and OpenMP.

Information Management Systems Institute, Athens, Greece Dec 2012 – Dec 2023

Software Engineer

Participated in several Greek and European funding projects, including:

- MORE: Management of Real-time Energy data.
  (Oct 2020 – Dec 2023)
  - Developed a continuous evaluation module for edge-based sliding-window aggregations in Java.
  - Built parallel and distributed pattern extraction methods using Python and Dask, improving processing. efficiency.
- Amnesia: A Powerful Data Anonymization Platform.
  (Aug 2015 – Sep 2020)
  - Designed and built the framework from scratch as the lead software engineer.
- MoDisSENSE: A Distributed Spatio-Temporal and Textual Processing Platform for Social.
  (Dec 2012 - Jul 2015)
  - Engineered scalable algorithms for POI discovery and trajectory reconstruction using Hadoop, HBase, and PostGIS.
  - Designed and implemented web services supporting POI discovery and recommendation.

Institute of CS, Johannes Gutenberg University Mainz, Germany May 2022 – Jul 2022

Research Visitor

- PhD internship at the Institute of Computer Science with Professor Panagiotis Bouros, focusing on spatial joins.

Hellenic Army Information Technology Support Center, Greece Apr 2017 – Nov 2018

Software Engineer

- Maintain and update code for multiple Java applications, while developing new features.

Awards

3rd place Future of Database Programming Contest, Athens Mar 2025

Education

Ph.D., Computer Science Jul 2019 – Dec 2024

Department of Computer Science & Engineering, University of Ioannina

Thesis: In-memory Indexing for Parallel Processing of Single and Multi-Dimensional Queries

M.Sc., Computing Systems: Software and Hardware, Computer Science Nov 2012 – Sep 2016

Department of Informatics and Telecommunications, University of Athens

Thesis: Complex Event Processing (CEP) for Intrusion Detection

B.Sc., Computer Science Sep 2006 – Jun 2012

Department of Informatics and Telecommunications, University of Athens

Thesis: Clustering Wikipedia resources

Technical Skills

Languages	C, C++, Java, Python
Data Management	MySQL, PostgreSQL, PostGIS, HBase
Parallel & Systems Programming:	OpenMP, SIMD, MPI
Distributed Data Frameworks:	Hadoop, Spark, Dask
Web & Frameworks:	Spring, JavaScript, JSP, JSF, PHP
Operating Systems:	Ubuntu, Microsoft Windows, macOS

Selected Publications

Dimitrios Tsitsigkos, Achilleas Michalopoulos, Nikos Mamoulis, and Manolis Terrovitis (2026). "B^S-tree: A gapped data-parallel B-tree". In: *IEEE International Conference on Data Engineering, (ICDE).*

Dimitrios Tsitsigkos, Panagiotis Bouros, Konstantinos Lampropoulos, Nikos Mamoulis, and Manolis Terrovitis (2024). "Two-Layer Space-Oriented Partitioning for Non-Point Data". In: *IEEE Transactions on Knowledge and Data Engineering (TKDE).*

Panagiotis Bouros, Nikos Mamoulis, Dimitrios Tsitsigkos, and Manolis Terrovitis (2021). "In-Memory Interval Joins". In: *VLDB J.*

Dimitrios Tsitsigkos, Konstantinos Lampropoulos, Panagiotis Bouros, Nikos Mamoulis, and Manolis Terrovitis (2021). "A Two-layer Partitioning for Non-point Spatial Data". In: *IEEE International Conference on Data Engineering, (ICDE).*

Other

Languages	Greek (native), English (Advanced)
Volunteer	European Data Forum 2014, EDBT/ICDT 2023 Joint Conference, 6th ACM Europe Summer School on Data Science 2025, HDMS 2025.