George Christodoulou

George Christodoulou | giorgoschristodoulou.github.io | g.c.christodoulou@tudelft.nl | Google Scholar

Education

Ph.D. in Databases (summa cum laude) Mar 2020 - Sep 2023

University of Ioannina *Ioannina, Greece*

Topic: "Interval Data Management in Main Memory"

Supervisor: Nikolaos Mamoulis

M.Sc. in Computer Science (summa cum laude) Sep 2018 - Feb 2020

University of Ioannina *Ioannina, Greece*

Thesis: "A Prefix-based Hybrid Solution for Main Memory Indexing"

Supervisor: Nikolaos Mamoulis

Diploma (M.Eng.) in Computer Science & Engineering Sep 2011 - Sep 2017

University of Ioannina *Ioannina, Greece*

Thesis: "Routing Methods with Machine Learning on Delay Tolerant Networks."

Supervisor: Evangelos Papapetrou

Employment

Postdoctoral Researcher Oct 2023 – Present

Delft University of Technology *Delft, Netherlands*

- Research line: Revisiting data access paths and patterns for transactional Cloud applications.
- Working on stream processing, distributed database systems, transactions, fault tolerance and stateful serverless
- Mentoring PhD and MSc students; authoring scientific papers; co-teaching Web-scale Data Management (MSc) and Information and Data Management (BSc).

Research Program Scholar May 2020 - Jul 2023

Organization of Special Account of Research Funds, University of Ioannina *Ioannina, Greece*

- Smart City Bus Project (IoT Platform for Transportation)
- ProximIoT Project (IoT Platform for Proximity Marketing)

Research Assistant May 2019 – Sep 2019

Research & Technology Hellas (CERTH) *Thessaloniki, Greece*

- Worked on designing and developing an anomaly detector with machine learning for the "Secure and Safe IoT" project.
- Used Python, PyTorch, Tensorflow.

Software Engineer Jul 2016 – Aug 2016

Natech S.A. *Ioannina, Greece*

- Worked on designing and developing a ASP.NET MVC web application.
- Used C#, MVC

Publications

Selected Publications

- **Styx: Transactional Stateful Functions on Streaming Dataflows**
  K. Psarakis, **G. Christodoulou**, G. Siachamis, M. Fragkoulis, A. Katsifodimos
  ACM International Conference on Management of Data **(SIGMOD)** 2025, **(CORE A*)**.

- **LIT: Lightning-fast In-memory Temporal Indexing**
  G. Christodoulou, P. Bouros, N. Mamoulis.
  ACM International Conference on Management of Data **(SIGMOD)** 2024, **(CORE A*)**.
- **HINT: A Hierarchical Index for Intervals in Main Memory**
  G. Christodoulou, P. Bouros, N. Mamoulis.
  ACM International Conference on Management of Data **(SIGMOD)** 2022, **(CORE A*)**.

Other Publications: International Journals

- **Scalable Lighting-fast Temporal Indexing**
  P. Simatis, **G. Christodoulou**, P. Bouros, N. Mamoulis.
  International Journal on Very Large Databases **(VLDBJ)** 2025, **(CORE A*)**, Under submission.
- **Querying Interval Data on Steroids**
  P. Bouros, **G. Christodoulou**, C. Rauch, A. Titkov, N. Mamoulis.
  Transactions on Knowledge and Data Engineering **(TKDE)** 2025, **(CORE A*)**.
- **HINT: A Hierarchical Interval Index for Allen Relationships**
  G. Christodoulou, P. Bouros, N. Mamoulis.
  International Journal on Very Large Databases **(VLDBJ)** 2023, **(CORE A*)**.

Other Publications: International Conferences

- **Styx in Action: Transactional Cloud Applications Made Easy**
  K. Psarakis, O. Mraz, **G. Christodoulou**, G. Siachamis, M. Fragkoulis, A. Katsifodimos.
  International Conference on Very Large Databases **(VLDB)** 2025 Demo, **(CORE A*)**.
- **Transactional Cloud Applications Go with the (Data)Flow**
  K. Psarakis, **G. Christodoulou**, M. Fragkoulis, A. Katsifodimos.
  Conference on Innovative Data Systems Research **(CIDR)** 2025, **(CORE A)**.
- **Transactional Cloud Applications: Status Quo, Challenges, and Opportunities**
  R. Laigner, **G. Christodoulou**, K. Psarakis, A. Katsifodimos, Yongluan Zhou.
  ACM International Conference on Management of Data **(SIGMOD)** 2025 (Tutorial), **(CORE A*)**.
- **Evaluating Stream Processing Autoscalers**
  G. Siachamis, **G. Christodoulou**, K. Psarakis, M. Fragkoulis, A. van Deursen, A. Katsifodimos.
  International Conference on Distributed and Event-based Systems **(DEBS)** 2024.
- **HINT on Steroids: Batch Query Processing for Interval Data**
  P. Bouros, A. Titkov, **G. Christodoulou**, C. Rauch, N. Mamoulis.
  International Conference on Extending Database Technology **(EDBT)** 2024, **(CORE A)**.
- **SmartCityBus - A Platform for Smart Transportation Systems.**
  G. Bouloukakis, C. Zeginis, N. Papadakis, K. Magoutis, **G. Christodoulou**,
  C. Kosyfaki, K. Lampropoulos, N. Mamoulis
  ACM International Conference on Web Search and Data Mining **(WSDM)** 2023 (abstract), **(CORE A)**.

Other Publications: International Workshops

- **Cascade: From Imperative Code to Stateful Dataflows**
  M. Schutte, L. Van Mol, **G. Christodoulou**, A. Katsifodimos.
  International Symposium on Database Programming Languages **(DBPL)** 2025.
- **Efficient And Scalable Management Of Interval Data**
  G. Christodoulou
  International Conference on Extending Database Technology PhD Workshop **(EDBT)** 2023, **(CORE A)**.

Teaching

Delft University of Technology Oct 2023 – Present
Electrical Engineering, Mathematics & Computer Science Department *Delft, Netherlands*

- Spring 2024 co-teaching Web-scale Data Management (MSc).
- Spring 2024 co-teaching Information and Data Management (BSc).

University of Ioannina Sep 2017 - July 2023
Department of Computer Science and Engineering *Ioannina, Greece*

- Spring 2023 co-teaching Complex Data Management (BSc).
- Fall 2020-2022: Python lab assistant; Spring 2018: Java lab assistant; Fall 2017-2019: Networks lab assistant.

Student Supervision

PhD

- Oto Mraz, Evaluating Deterministic Database Sequencers, TU Delft
- Marcus Schutte, Compiling Actors to Stateful Streaming Programs, TU Delft
- Kyriakos Psarakis, Democratizing Scalable Cloud Applications, TU Delft
- George Siachamis, Adaptivity for Streaming Dataflow Engines, TU Delft, **grad. 2024**

MSc

- Lucas Van Mol, Intermediate representation for dataflows, TU Delft
- Smruti Kshirsagar, Efficient queries in external data stores, TU Delft
- Mitali Patil, Global state queries in stream processing, TU Delft
- Giorgos Kotsinas, Ranking queries over range data, UoI, **grad. 2024**

Bachelor

- Sebastian Hemberger, Indexing composite interval data, JGU, **grad. 2024**
- Dennis Scheck, Generating and visualizing complex interval data, JGU, **grad. 2024**
- Jan Raider, A graphical user interface for managing interval data, JGU, **grad. 2024**
- Vasileios Georgoulas, A web application for passenger movement with public transport, UoI, **grad. 2023**
- Danae Tsaousi, Visualization and analysis of public transport data, UoI, **grad. 2023**
- Penelope Eleftheriadi, Visualization and analysis of public transport data, UoI, **grad. 2023**
- Filippos Papachristou, Implementation and evaluation of a main memory temporal index, UoI, **grad. 2023**

Research Internships

Research Visit Jan 2023 - Feb 2023
Hong Kong University of Science and Technology (HKUST) *Hong Kong*

- Working on query optimization for multiversion data with Prof. Papadias.

Research Visit Feb 2022 - Apr 2022
University of Mainz (JGU) *Mainz, Germany*

- Working on query optimization for Allen's predicates with Prof. Bouros.

Software

- "HINT" is a novel in-memory index for intervals, with a focus on overlap queries along with Allen's algebra predicates. The intervals are stored as binary representations in a hierarchy of partitions. Multiple optimizations add to efficient storage consumption, sparsity&skewness handling, and fast look-ups. Code is written entirely in CPP.
  Note: Github repo is used only for release, development was done in private.
- "LIT" is a novel hybrid index, decoupling the management of the current and past states of an indexed column. The method includes optimized indexing modules for fast look-ups and update-heavy workloads. While multiple implementations were benchmarked for handling both parts, the best performing combination of structures is *i*) a custom hash-index optimized for non-random accesses on range queries for current records, *ii*) an hierarchical index

inspired from HINT for the past records. Code is written entirely in CPP.
Note: Github repo is used only for release, development was done in private.

Service

- Reviewer for PAKDD 2021, ICDE 2024, DEBS 2024, VLDB 2025-2026, EDBT 2026, Frontiers in Big Data Journal
- External Reviewer for ICDE 2019-2023, VLDB 2020-2024, SIGMOD 2020, EDBT 2020, DASFAA 2023
- Conference Volunteer at EDBT 2023, Ioannina, Greece

Technical Skills

Programming Languages: C/C++ (advanced), Java (intermediate), Python (intermediate).
Other Skills: Complex data management, Complex data indexing, Scalable Data Management, Query Processing, Stream Processing, Machine learning techniques, ASP.NET MVC

Languages

Greek (Native speaker), Dutch (Native speaker), English (Full Professional Proficiency).