# Curriculum Vitae

Anton Dignös

## Personal Information


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| **First Name:** | Anton |
| **Last Name:** | Dignös |
| **Office Address:** | Free University of Bozen-Bolzano<br>Faculty of Engineering<br>NOI Techpark - Bruno-Buozzi-Straße 1 - via Bruno Buozzi 1<br>39100 Bozen - Bolzano, Italy |
| | Phone: +39 0471 016142<br>Email: `anton.dignoes@unibz.it`<br>Website: `https://www.inf.unibz.it/~dignoes/` |


## Education

**Nov. 2010 – Nov. 2014**: PhD studies in Computer Science, Database Technology Research Group, Department of Informatics, University of Zurich, Zurich, Switzerland;
Thesis: *Interval-Dependent Attributes in Relational Database Systems*; advisor: Prof. Dr. Michael H. Böhlen; co-advisor: Prof. Dr. Christian S. Jensen, Aalborg University, Denmark.

**Sep. 2008 – Oct. 2010**: MSc studies in Computer Science, Faculty of Computer Science, Free University of Bozen-Bolzano, Bozen, Italy;
Thesis: *Temporal Unification for Database Management Systems*; advisor: Prof. Dr. Johann Gamper.

**Sep. 2005 – Oct. 2008**: BSc studies in Applied Computer Science, Faculty of Computer Science, Free University of Bozen-Bolzano, Bozen, Italy;
Thesis: *Temporal Multi-Dimensional Aggregation for Almost Sorted Data*; advisor: Prof. Dr. Johann Gamper.

**2000 – 2003**: Gewerbeoberschule "Max Valier" (technical institute), specialization in electrical engineering and automation systems, Bozen, Italy.

**1997 – 2000**: Lehranstalt für Industrie und Handwerk "Johann Kravogl" (professional institute), specialization in electrical engineering, Bozen, Italy.

## Degrees

**2021**: Italian national habilitation as associate professor (sector 01/B1 – computer science).

**2014**: PhD in Computer Science (Dr. sc.) with "summa cum laude", University of Zurich, Zurich, Switzerland.

**2010**: MSc in Computer Science, Free University of Bozen-Bolzano, Bozen, Italy.

**2008**: BSc in Applied Computer Science, Free University of Bozen-Bolzano, Bozen, Italy.

## Language knowledge

- German: native
- Italian: level C1 (Esame di bilinguismo A, Autonomous Province of Bozen-Bolzano, July 1, 2015)
- English: level C1 (Certificate in Advanced English, Cambridge English, June 2015; internal C1 exam, Language Centre of the Free University of Bozen-Bolzano, August 2020)

## Professional Experience

**Jun. 2025 – present**: Tenured Associate Professor, Faculty of Engineering, Free University of Bozen-Bolzano, Bozen, Italy.

**Jun. 2022 – May 2025**: Tenure track Assistant Professor (RTDb), Faculty of Engineering, Free University of Bozen-Bolzano, Bozen, Italy.

**Feb. 2021 – Jun. 2021**: Research and Teaching Stay, Department of Informatics, University of Zurich, Zurich, Switzerland.

**Dec. 2020 – May 2022**: Assistant Professor (RTDa), Faculty of Computer Science, Free University of Bozen-Bolzano, Bozen, Italy.

**Dec. 2017 – Nov. 2020**: Assistant Professor (RTDa), Faculty of Computer Science, Free University of Bozen-Bolzano, Bozen, Italy.

**Dec. 2014 – Nov. 2017**: Assistant Professor (RTDa), Faculty of Computer Science, Free University of Bozen-Bolzano, Bozen, Italy.

**Nov. 2010 – Nov. 2014**: Research and Teaching Assistant, Database Technology Research Group, Department of Informatics, University of Zurich, Zurich, Switzerland.

**Feb. 2010 – May 2010**: Teaching Assistant, Database Technology Research Group, Department of Informatics, University of Zurich, Zurich, Switzerland.

**Jul. 2009 – Oct. 2009**: Researcher with Project Contract, Faculty of Computer Science, Free University of Bozen-Bolzano, Bozen, Italy. Topic: *Temporal/Spatial Aggregation*.

**Jul. 2008 – Sep. 2008**: Researcher with Project Contract, Faculty of Computer Science, Free University of Bozen-Bolzano, Bozen, Italy. Topic: *Temporal Aggregation*.

**Nov. 2003 – Nov. 2005**: Help Desk employee for Microsoft Office and SAP, Brennercom Inc., Bozen, Italy.

## Research Statement

My main research focus is on interval-timestamped temporal databases, time-series data, and data analytics. My research is driven by data and problems that emerge from real world applications and my research method combines foundational studies with system engineering and empirical evaluations. The obtained research results have been published in the most prestigious conferences and journals of the database community (3 ICDE, 2 SIGMOD, 2 EDBT, 4 PVLDB, 3 Inf. Syst., 2 VLDBJ, 1 TODS). In my work I developed temporal primitives that allow querying interval-timestamped data in relational database systems, in a principled way, and an approach to scale attribute values that are interval-dependent. I implemented and integrated this work into the kernel of the open source database system PostgreSQL (available at `http://tpg.inf.unibz.it`) and submitted it as a patch to the PostgreSQL community. The primary line of research in the next future will be to progress current research activities and to address new challenges in the area of data-centric applications for temporal and spatial databases. I will continue to strengthen the principle of quality and target top tier international conferences and journals for publishing my research results.

## Honors and Awards

**2023**: Best paper award at the 35th International Conference on Scientific and Statistical Database Management for the paper "Indexing Temporal Relations for Range-Duration Queries" [c20].

**2022**: Best paper award at the 26th European Conference on Advances in Databases and Information Systems for the paper "Querying Temporal Anomalies in Healthcare Information Systems and Beyond" [c18].

**2017**: Article "Extending the Kernel of a Relational DBMS with Comprehensive Support for Sequenced Temporal Queries" [j1] selected as part of the 21st Annual Best of Computing - Notable Books and Articles of 2016 by ACM Computing Reviews (`http://www.computingreviews.com`).

**2017**: Best paper award at the 21st European Conference on Advances in Databases and Information Systems for the paper "Sparse Prefix Sums" [c8].

## Research Projects and Funds

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| **Project**: | DiCAM |
| Period: | 01.04.2025 – 31.03.2027 |
| Funding: | € 499,400 (total) – € 251,360 (unibz) |
| Funded by: | Autonomous Province of Bozen/Bolzano |
| Role: | Principal investigator |
| Objectives: | Design and development of a cutting edge data infrastructure for climate change adaptation and mitigation. |

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| **Project**: | DyHealthNet |
| Period: | 01.01.2024 – 31.12.2026 |
| Funding: | € 150,000 (unibz) |
| Funded by: | Autonomous Province of Bozen/Bolzano (Joint Projects Germany – South Tyrol; evaluated by DFG) |
| Role: | Co-investigator (unibz) |
| Objectives: | Development of a network-based data analysis platform that integrates heterogeneous data and supports explorative data analytics over dynamically generated subsets of the CHRIS study data. |

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| **Project**: | DIADEM |
| Period: | 15.12.2021 – 14.06.2025 |
| Funding: | € 179,400 |
| Funding Agency: | Free University of Bozen-Bolzano |
| Role: | Co-investigator |
| Objectives: | Development of a data driven anomaly detection framework for sustainable water and energy smart grids. |

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| **Project**: | ISTeP |
| Period: | 01.10.2020 – 30.09.2023 |
| Funding: | € 260,000 |
| Funded by: | Autonomous Province of Bozen/Bolzano |
| Role: | Co-investigator |
| Objectives: | Development of techniques to boost the efficiency and scalability of query processing in the temporal alignment framework. |

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| **Project**: | PREMISE |
| Period: | 24.09.2020 – 31.12.2022 |
| Funding: | € 466.415 (total) – € 130,026 (unibz) |
| Funded by: | ERDF (EFRE/FESR) 2014-2020 |
| Role: | Co-investigator |
| Objectives: | Development and implementation of a framework for predictive maintenance for industrial equipments. |

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| **Project**: | SDST |
| Period: | 01.04.2019 – 30.06.2019 |
| Funding: | € 10,000 |
| Funded by: | NOI Techpark Südtirol / Alto Adige |
| Role: | Principal investigator |
| Objectives: | Design, development and execution of a survey on database technology in South Tyrol. |

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| **Project**: | ISMarD |
| Period: | 01.08.2018 – 31.01.2022 |
| Funding: | € 120,000 |

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| Funding Agency: | Free University of Bozen-Bolzano |
| Role: | Co-investigator |
| Objectives: | Development of an intelligent platform for stock market (timeseries) data. |

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| **Project**: | VCTP |
| Period: | 16.06.2017 – 15.06.2020 |
| Funding: | € 19,000 |
| Funding Agency: | Free University of Bozen-Bolzano |
| Role: | Principal investigator from 01.02.2019 onwards |
| Objectives: | Development of visualization techniques for comparing interval-timestamped data. |

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| **Project**: | TASMA |
| Period: | 01.01.2018 – 30.09.2020 |
| Funding: | € 66,000 |
| Funding Agency: | Free University of Bozen-Bolzano |
| Role: | Co-investigator |
| Objectives: | Development of a time series processing framework for industry 4.0. |

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| **Project**: | DaSTS |
| Period: | 01.06.2017 – 31.05.2018 |
| Funding: | $ 88,000 |
| Funded by: | Oracle Inc. |
| Role: | Co-investigator for unibz |
| Objectives: | Design and development to deeply integrate comprehensive time series support in database systems. |

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| **Project**: | EMMA |
| Period: | 01.01.2017 – 31.12.2018 |
| Funding: | € 70,000 |
| Funding Agency: | Free University of Bozen-Bolzano |
| Role: | Co-investigator |
| Objectives: | Development of models and algorithms for efficient route planning in multi-modal transportation networks. |

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| **Project**: | periodVis |
| Period: | 01.08.2016 – 30.11.2017 |
| Funding: | € 20,000 |
| Funding Agency: | Free University of Bozen-Bolzano |
| Role: | Principal investigator |
| Objectives: | Design and development of visualization techniques for interval-timestamped data. |

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| **Project**: | TPG |
| Period: | 01.11.2015 – 31.10.2017 |
| Funding: | € 50,000 |
| Funding Agency: | Free University of Bozen-Bolzano |
| Role: | Principal investigator |
| Objectives: | Design and development to boost relational database technology to support the processing of interval-timestamped data. |

# Publications

For journal publications, the quartile Q1 (best), Q2, Q3, or Q4 based on Scopus' ranking SCImago[1] is provided, and for conference publications, the ICORE conference rating [2] (also adopted by Gruppo di Ingegneria Informatica GII and GRuppo di INformatica GRIN) with ratings A* (best), A, B, C, or Other, for the time of publication is provided.

## International Journal Publications

**[j20]** F. Persia, A. Dignös, S. Helmer, J. Gamper, and D. D'Auria. Modeling and Detecting High-Level Events in Healthcare Applications Exploiting ISEQL+. In *Soft Computing*, in press, 2025.
Rating: Q2

**[j19]** M. Ceccarello, A. Dignös, J. Gamper, and C. Khnaisser. Indexing Temporal Relations for Range-Duration Queries. In *Distributed and Parallel Databases*, Volume 43, Number 7, 2025.
DOI: https://doi.org/10.1007/s10619-024-07452-6
Rating: Q2

**[j18]** L. Althaus, M. Khayati, A. Khelifati, A. Dignös, D. Difallah, and P. Cudre-Mauroux. SEER: An End-to-End Toolkit for Benchmarking Time Series Database Systems in Monitoring Applications. In *Proceedings of the VLDB Endowment*, PVLDB '24, 17(12): 4361–4364, 2024.
DOI: https://doi.org/10.14778/3685800.3685875
Rating: Q1

**[j17]** M. Mozaffari, A. Dignös, J. Gamper, and U. Störl. Self-tuning Database Systems: A Systematic Literature Review of Automatic Schema Design and Tuning. In *ACM Computing Surveys*, 56(11), June 2024.
DOI: https://doi.org/10.1145/3665323
Rating: Q1

**[j16]** C. Khnaisser, H. Hamrouni, D. B. Blumenthal, A. Dignös, and J. Gamper. Efficiently labeling and retrieving temporal anomalies in relational databases. In *Information Systems Frontiers*, in press, 2024.
DOI: https://doi.org/10.1007/s10796-024-10495-w
Rating: Q1

**[j15]** A. Khelifati, M. Khayati, A. Dignös, D. Difallah, and P. Cudre-Mauroux. TSM-Bench: Benchmarking Time Series Database Systems for Monitoring Applications. In *Proceedings of the VLDB Endowment*, PVLDB '23, 16(11): 3363–3376, August 2023.
DOI: https://doi.org/10.14778/3611479.3611532
Rating: Q1

**[j14]** 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. T. Zacharatou, S. Wang, X. Wang, X. Wang, R. Chi-Wing 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 *IEEE Data Engineering Bulletin*, 47(4), December 2023.
Link: http://sites.computer.org/debull/A23dec/p4.pdf
Rating: -

**[j13]** D. Massimo, E. Ganthaler, A. Buriro, F. Barile, M. Moraschini, A. Dignös, T. Villgrattner, A. Peer, and F. Ricci. Estimation of Mass and Length of Sintered Workpieces using Predictive Models. In *IEEE Transactions on Instrumentation and Measurement*, TIM '23, Volume 72, pp. 1–14 2023.
DOI: https://doi.org/10.1109/TIM.2023.3298413
Rating: Q1

**[j12]** Y. Borgianni, L. Maccioni, A. Dignös, D. Basso. A Framework to Evaluate Areas of Interest for Sustainable Products and Designs. *Sustainability*, Volume 14, Issue 13, 2022.
DOI: https://doi.org/10.3390/su14137931
Rating: Q2

[1] https://www.scimagojr.com
[2] https://portal.core.edu.au/conf-ranks/

**[j11]** D.B. Blumenthal, S. Bougleux, A. Dignös, J. Gamper. Enumerating dissimilar minimum cost perfect and error-correcting bipartite matchings for robust data matching. *Information Sciences*, Volume 596, pp. 202–221, June 2022.
DOI: https://doi.org/10.1016/j.ins.2022.03.017
Rating: Q1

**[j10]** A. Dignös, M. H. Böhlen, J. Gamper, C. S. Jensen, and P. Moser. Leveraging Range Joins for the Computation of Overlap Joins. *The VLDB Journal*, Volume 31, Issue 1, pp. 75–99, January 2022.
DOI: https://doi.org/10.1007/s00778-021-00692-3
Rating: Q1

**[j9]** D. Piatov, S. Helmer, A. Dignös, and F. Persia. Cache-Efficient Sweeping-Based Interval Joins for Extended Allen Relation Predicates. *The VLDB Journal*, Volume 30, Issue 3, pp. 379–402, May 2021.
DOI: https://doi.org/10.1007/s00778-020-00650-5
Rating: Q1

**[j8]** V. Del Fatto, A. Dignös, G. Raimato, L. Maccioni, Y. Borgianni, and J. Gamper. Visual Time Period Analysis: a Multimedia Analytics Application for Summarizing and Analyzing Eye-Tracking Experiments. In *Multimedia Tools and Applications*, Volume 78, Issue 23, pp. 32779–32804, December 2019.
DOI: https://doi.org/10.1007/s11042-019-07950-1
Rating: Q2

**[j7]** A. Dignös, B. Glavic, X. Niu, J. Gamper, and M. H. Böhlen. Snapshot Semantics for Temporal Multiset Relations. In *Proceedings of the VLDB Endowment*, PVLDB '19, 12(6): 639–652, February 2019.
DOI: https://doi.org/10.14778/3311880.3311882
Rating: Q1

**[j6]** G. Mahlknecht, A. Dignös, and N. Kozmina. Modeling and Querying Facts with Period Timestamps in Data Warehouses. *International Journal of Applied Mathematics and Computer Science*, Volume 29, Number 1, pp. 31–49, March 2019.
DOI: https://doi.org/10.2478/amcs-2019-0003
Rating: Q2

**[j5]** D. Piatov, S. Helmer, A. Dignös, and J. Gamper. Interactive and Space-Efficient Multi-Dimensional Time Series Subsequence Matching. *Information Systems*, Volume 82, pp. 121–135, May 2019.
DOI: https://doi.org/10.1016/j.is.2018.08.002
Rating: Q1

**[j4]** M. Shekelyan, A. Dignös, and J. Gamper. Sparse Prefix Sums: Constant-Time Range Sum Queries Over Sparse Multidimensional Data Cubes. *Information Systems*, Volume 82, pp. 136–147, May 2019.
DOI: https://doi.org/10.1016/j.is.2018.06.009
Rating: Q1

**[j3]** M. Shekelyan, A. Dignös, and J. Gamper. DigitHist: a Histogram-Based Data Summary with Tight Error Bounds. In *Proceedings of the VLDB Endowment*, PVLDB '17, 10(11): 1514–1525, August 2017.
DOI: https://doi.org/10.14778/3137628.3137658
Rating: Q1

**[j2]** G. Mahlknecht, A. Dignös, and J. Gamper. A Scalable Dynamic Programming Scheme for the Computation of Optimal k-Segments for Ordered Data. *Information Systems*, Volume 70, pages 2–17, October 2017.
DOI: http://dx.doi.org/10.1016/j.is.2016.08.002
Rating: Q1

**[j1]** A. Dignös, M. H. Böhlen, J. Gamper, and C. S. Jensen. Extending the Kernel of a Relational DBMS with Comprehensive Support for Sequenced Temporal Queries. *ACM Transactions on Database Systems*, TODS 2016, 41(4), Article 26, 46 pages, ACM, November 2016.
DOI: http://dx.doi.org/10.1145/2967608
Rating: Q1

## International Conference Publications

[**c25**] M. Mozaffari, A. Dignös, O. Lanz, D. Matt, G. P. Monizza, M. Gauly, and J. Gamper. ONFOOD: A Substitute Recommendation System in Food Recipes. In *Proceedings of the 36th International Conference on Database and Expert Systems Applications*, DEXA '25, accepted for publication, 2025.
Rating: C

[**c24**] I. Reppas, M. Mirabi, L. Fathi, C. Binnig, A. Dignös, and J. Gamper. Parallel Processing of Temporal Anti-Joins in Memory. In *Proceedings of the 29th International Conference on Database Systems for Advanced Applications*, DASFAA '24, Gifu, Japan, pages 86–102, 2024.
DOI: https://doi.org/10.1007/978-981-97-5552-3_6
Rating: B

[**c23**] M. Mirabi, L. Fathi, A. Dignös, J. Gamper, and C. Binnig. A New Primitive for Processing Temporal Joins. In *Proceedings of the 18th International Symposium on Spatial and Temporal Databases*, SSTD '23, Calgary, Alberta, Canada, pages 106–109, 2023.
DOI: https://doi.org/10.1145/3609956.3609968
Rating: B

[**c22**] A. Przybylek, A. Karpus, A. Hadjali, A. Dignös, C. S. Hara, D. Pla Karidi, E. Zumpano, F. Persia, G. Vargas-Solar, G. Papastefanatos, G. Sperlì, G. Giannopoulos, I. Lukovic, J. Aligon, M. Terrovitis, M. Grzegorowski, M. Bonomo, M. Halfeld Ferrari Alves, N. Labroche, P. Monsarrat, R. Chbeir, S. Sellami, S. Tirupathi, S. E. Rombo, S. Kordic, S. Ristic, T. Di Noia, T. Bach Pedersen, and V. Moscato. Databases and Information Systems: Contributions from ADBIS 2023 Workshops and Doctoral Consortium. In *Proceedings of the 27th European Conference on Advances in Databases and Information Systems (Short Papers)*, ADBIS '23, Barcelona, Spain, pages 293–311, 2023.
DOI: https://doi.org/10.1007/978-3-031-42941-5_26
Rating: C

[**c21**] M. Mozaffari, A. Dignös, H. Hamrouni, and J. Gamper. NoSQL Schema Extraction from Temporal Conceptual Model: A Case for Cassandra. In *Proceedings of the 27th European Conference on Advances in Databases and Information Systems (Short Papers)*, ADBIS '23, Barcelona, Spain, pages 280–290, 2023.
DOI: https://doi.org/10.1007/978-3-031-42941-5_25
Rating: C

[**c20**] M. Ceccarello, A. Dignös, J. Gamper, and C. Khnaisser. Indexing Temporal Relations for Range-Duration Queries. In *Proceedings of the 35th International Conference on Scientific and Statistical Database Management*, SSDBM '23, Los Angeles, CA, USA, pages 3:1–3:12, 2023.
DOI: https://doi.org/10.1145/3603719.3603732
Rating: B

[**c19**] J. Gamper., M. Ceccarello, and A. Dignös. What's New in Temporal Databases?. In *Proceedings of the 26th European Conference on Advances in Databases and Information Systems*, ADBIS '22, Torino, Italy, pages 45–58, 2022.
DOI: https://doi.org/10.1007/978-3-031-15740-0_5
Rating: B

[**c18**] C. Khnaisser, H. Hamrouni, D. B. Blumenthal, A. Dignös, and J. Gamper. Querying Temporal Anomalies in Healthcare Information Systems and Beyond. In *Proceedings of the 26th European Conference on Advances in Databases and Information Systems*, ADBIS '22, Torino, Italy, pages 209–222, 2022.
DOI: https://doi.org/10.1007/978-3-031-15740-0_16
Rating: B

[**c17**] A. Charane, M. Ceccarello, A. Dignös, and J. Gamper. Efficient Computation of All-Window Length Correlations. In *Proceedings of the 15th International Baltic Conference on Digital Business and Intelligent Systems*, DB&IS '22, Riga, Latvia, pages 251–266, 2022.
DOI: https://doi.org/10.1007/978-3-031-09850-5_17
Rating: -

[**c16**] T. Liu, P. Coletti, A. Dignös, J. Gamper, and M. Murgia. Correlation graph analytics for stock time series data. In *Proceedings of the 24th International Conference on Extending Database Technology (Demo track)*, EDBT '21, Nicosia, Cyprus, pages 666–669, 2021.
DOI: https://dx.doi.org/10.5441/002/edbt.2021.79
Rating: A

[**c15**] M. Shekelyan, A. Dignös, J. Gamper, and M. N. Garofalakis. Approximating multidimensional range counts with maximum error guarantees. In *Proceedings of the 2021 IEEE 37th International Conference on Data Engineering*, ICDE '21, Chania, Crete, Greece, pages 1595–1606, 2021.
DOI: https://www.doi.org/10.1109/ICDE51399.2021.00141
Rating: A*

[**c14**] J. Gamper and A. Dignös. Processing Temporal and Time Series Data: Present State and Future Challenges. In *Proceedings of the 24th European Conference on Advances in Databases and Information Systems*, ADBIS '20, Lyon, France, pages 8–14, Springer, 2020.
DOI: https://doi.org/10.1007/978-3-030-54832-2_2
Rating: B

[**c13**] A. Behrend, A. Dignös, J. Gamper, P. Schmiegelt, H. Voigt, M. Rottmann, and K. Kahl. Period Index: A Learned 2D Hash Index for Range and Duration Queries. In *Proceedings of the 16th International Symposium on Spatial and Temporal Databases*, SSTD '19, Vienna, Austria, pages 100–109, 2019.
DOI: https://doi.org/10.1145/3340964.3340965
Rating: A

[**c12**] N. Duran, G. Mahlknecht, A. Dignös, and J. Gamper. HotPeriods: Visual Correlation Analysis of Interval Data. In *Proceedings of the 16th International Symposium on Spatial and Temporal Databases (Demo track)*, SSTD '19, Vienna, Austria, pages 178–181, 2019.
DOI: https://doi.org/10.1145/3340964.3340989
Rating: A

[**c11**] M. H. Böhlen, A. Dignös, J. Gamper, and C. S. Jensen. Database Technology for Processing Temporal Data (Invited Paper). In *Proceedings of the 25th International Symposium on Temporal Representation and Reasoning*, TIME '18, Warsaw, Poland, pages 2:1–2:7, 2018.
DOI: https://doi.org/10.4230/LIPIcs.TIME.2018.2
Rating: B

[**c10**] M. H. Böhlen, A. Dignös, J. Gamper, and C. S. Jensen. Temporal Data Management – An Overview. In *Business Intelligence and Big Data, eBISS '17, Lecture Notes in Business Information Processing*, pages 51–83, 2018.
DOI: https://doi.org/10.1007/978-3-319-96655-7_3
Rating: -

[**c9**] V. Del Fatto, A. Dignös, and J. Gamper. TIME°DIFF: a Visual Approach to Compare Period Data. In *Proceedings of the 22nd International Conference on Information Visualisation*, IV '18, Salerno, Italy, pages 38–43, 2018.
DOI: https://doi.org/10.1109/iV.2018.00017
Rating: B

[**c8**] M. Shekelyan, A. Dignös, and J. Gamper. Sparse Prefix Sums. In *Proceedings of the 21st European Conference on Advances in Databases and Information Systems*, ADBIS '17, Nicosia, Cyprus, pages 120–135, 2017.
DOI: https://doi.org/10.1007/978-3-319-66917-5_9
Rating: B

[**c7**] G. Mahlknecht, M. H. Böhlen, A. Dignös, and J. Gamper. VISOR: Visualizing Summaries of Ordered Data. In *Proceedings of the 29th International Conference on Scientific and Statistical Database Management (Demo track)*, SSDBM '17, Chicago, IL, USA, pages 40:1–40:5, 2017.
DOI: http://dx.doi.org/10.1145/3085504.3091115
Rating: A

[**c6**] K. Wellezohn, M. H. Böhlen, A. Dignös, J. Gamper, and H. Mitterer. Continuous Imputation of Missing Values in Streams of Pattern-Determining Time Series. In *Proceedings of the 20th International Conference on Extending Database Technology*, EDBT '17, Venice, Italy, pages 330–341, 2017.
DOI: http://dx.doi.org/10.5441/002/edbt.2017.30
Rating: A

[**c5**] D. Piatov, S. Helmer, and A. Dignös. An Interval Join Optimized for Modern Hardware. In *Proceedings of the 2016 IEEE 32nd International Conference on Data Engineering*, ICDE '16, Helsinki, Finland, pages 1098–1109, IEEE Computer Society, 2016.
DOI: http://dx.doi.org/10.1109/ICDE.2016.7498316
Rating: A*

[**c4**] G. Mahlknecht, A. Dignös, and J. Gamper. Efficient Computation of Parsimonious Temporal Aggregation. In *Proceedings of the 19th East European Conference on Advances in Databases and Information Systems*, ADBIS '15, Poitiers, France, pages 320–333, Springer, 2015.
DOI: http://dx.doi.org/10.1007/978-3-319-23135-8_22
Rating: B

[**c3**] A. Dignös, M. H. Böhlen, and J. Gamper. Overlap Interval Partition Join. In *Proceedings of the 2014 ACM SIGMOD International Conference on Management of Data*, SIGMOD '14, Snowbird, UT, USA, pages 1459–1470, ACM, 2014.
DOI: http://dx.doi.org/10.1145/2588555.2612175
Rating: A*

[**c2**] A. Dignös, M. Böhlen, and J. Gamper. Query Time Scaling of Attribute Values in Interval Timestamped Databases. In *Proceedings of the 2013 IEEE 29th International Conference on Data Engineering (Demo track)*, ICDE '13, Brisbane, Australia, pages 1304–1307, IEEE Computer Society, 2013.
DOI: http://dx.doi.org/10.1109/ICDE.2013.6544930
Rating: A*

[**c1**] A. Dignös, M. H. Böhlen, and J. Gamper. Temporal Alignment. In *Proceedings of the 2012 ACM SIGMOD International Conference on Management of Data*, SIGMOD '12, Scottsdale, AZ, USA, pages 433–444, ACM, 2012.
DOI: http://dx.doi.org/10.1145/2213836.2213886
Rating: A*

# Program Committee Member

International Conference on Data Engineering (ICDE) 2026, International Conference on Very Large Data Bases (VLDB) 2025, International Conference on Data Engineering (ICDE) 2025, ACM/SIGAPP Symposium On Applied Computing (SAC) 2025, European Conference on Advances in Databases and Information Systems (ADBIS) 2025, IEEE International Conference on Artificial Intelligence x Data & Knowledge Engineering (AIxDKE) 2024, International Conference on Big Data Analytics and Knowledge Discovery (DAWAK) 2024, European Conference on Advances in Databases and Information Systems (ADBIS) 2024, International Conference on Mobile Data Management (MDM) 2024 (Demo track), International Conference on Very Large Data Bases (VLDB) 2024, International Conference on Mobile Data Management (MDM) 2023 (Demo track), International Conference on Big Data Analytics and Knowledge Discovery (DAWAK) 2023, International Conference on Data Science, Technology and Applications (DATA) 2023, International Conference on Data Engineering (ICDE) 2023, International Conference on Very Large Data Bases (VLDB) 2023, International Conference on Advances in Databases, Knowledge, and Data Applications (DBKDA) 2023, International Conference on Data Engineering (ICDE) 2022 (Demo track), International Conference on Mobile Data Management (MDM) 2022 (Demo track), International Conference on Very Large Data Bases (VLDB) 2022, International Conference on Advances in Databases, Knowledge, and Data Applications (DBKDA) 2022, International Conference on Data Engineering (ICDE) 2021 (Demo track), International Symposium on Spatial and Temporal Databases (SSTD) 2021, International Conference on Advances in Databases, Knowledge, and Data Applications (DBKDA) 2021, International Conference on Data Engineering (ICDE) 2020, International Conference on Web Information Systems Engineering (WISE) 2020, International Symposium on Temporal Representation and Reasoning (TIME) 2020, International Conference on Database Systems for Advanced Applications

(DASFAA) 2020, International Conference on Advances in Databases, Knowledge, and Data Applications (DBKDA) 2020, International Conference on Web Information Systems Engineering (WISE) 2019, International Conference on Extending Database Technology (EDBT) 2019, International Conference on Extending Database Technology (EDBT) 2018, International Conference on Current Trends in Theory and Practice of Computer Science (SOFSEM) 2018, International Symposium on Temporal Representation and Reasoning (TIME) 2016, International Provenance and Annotation Workshop (IPAW) 2016.

## Reviewing Activity

Data and Knowledge Engineering 2025, Data and Knowledge Engineering 2024 (2), TKDE 2023, TKDE 2021, Information and Computation 2021, Information Systems 2020, JAIR 2020, TKDE 2020, VLDB Journal 2020, TODS 2019, TKDE 2018, Distributed and Parallel Databases 2018, Journal of Computer Science and Technology 2018, Informatica 2018, Journal of Computer Science and Technology 2017, Distributed and Parallel Databases 2017, ICDE 2017 (external reviewer), DASFAA 2017 (external reviewer), ICDE 2016 (external reviewer), Information Systems 2015, ADBIS 2015 (external reviewer), ICDE 2014 (external reviewer), SIGMOD Record 2014, TODS 2013, VLDB Journal 2012, TKDE 2011 (external reviewer), VLDB Journal 2011.

## Services to the Research Community

**2024-2025**: Program co-chair of DaWaK 2025 held in Bangkok, Thailand.

**2023-2024**: Program co-chair of the EDBT 2024 PhD Workshop held in Paestum, Italy.

**2023**: Co-chair of the AIDMA 2023 Workshop at ADBIS 2023 held in Barcelona, Spain.

**2022-2023**: Program co-chair of the EDBT 2023 PhD Workshop held in Ioannina, Greece.

**2022**: Invited panel member in the session Spatial and Temporal Data Management at ICDE 2022 held virtually.

**2020-2021**: Co-chair of the Student Research Forum at the SOFSEM 2021 held at the Free University of Bozen-Bolzano, Italy.

**2020-2021**: Web & Publicity chair of SOFSEM 2021 held at the Free University of Bozen-Bolzano, Italy.

**2018**: Local arrangements chair of SSDBM 2018 held at the Free University of Bozen-Bolzano, Italy.

## Services to the Faculty

**2022–present**: Member of the teaching committee of the PhD in Computer Science, Faculty of Computer Science, Free University of Bozen-Bolzano.

**2018-present**: Reference Teacher "docente di riferimento" for the MSc in Computer Science at the Free University of Bozen-Bolzano, Italy.

**2018-present**: Member of the commission for the selection procedure of the MSc in Computational Data Science at the Free University of Bozen-Bolzano, Italy.

**2017–present**: Member of the teaching committee of the MSc in Computer Science, Faculty of Computer Science, Free University of Bozen-Bolzano.

**2023, 2024, 2025**: Co-chair of the event "Computer Science Research Meets Business".

**2021–2024**: Second reader for PhD student Theo Abgrall of the Free University of Bozen-Bolzano that is supervised by Enrico Franconi.

**2022, 2023, 2024**: Co-organization of the event "Le Mille e una Scienza" at the Free University of Bozen-Bolzano.

**2022**: Nominated responsible for the dissemination and advertisement of the call for the PhD School in Computer Science of the Free University of Bozen-Bolzano.

**2021–2024**: Second reader for PhD student Muhammad Adnan of the Free University of Bozen-Bolzano that is supervised by Diego Calvanese and Guohui Xiao.

**2019**: Appointed as a representative for the discussions with the evaluation commission CEV ("Esperti di Valutazione") for the periodic accreditation of the Free University of Bozen-Bolzano.

**2017, 2018, 2019, 2020**: Co-organization of a hub for Google Hash Code at the Free University of Bozen-Bolzano.

**2016–2019**: Second reader for PhD student Elem Güzel of the Free University of Bozen-Bolzano that is supervised by Diego Calvanese and Guohui Xiao.

**2016**: Support the Bachelor Council at the Free University of Bozen-Bolzano in the revision of the bachelor program. The main activities included the development of the study program, specialization areas, course syllabi, and didactic documents for the university and ministry.

**2015–2018**: Study plan advisor and tutor for the curriculum Data and Knowledge Engineering of the Master in Computer Science, Faculty of Computer Science, Free University of Bozen-Bolzano.

**2015–2017**: Member of the teaching committee of the PhD in Computer Science, Faculty of Computer Science, Free University of Bozen-Bolzano.

# Research Prototypes and Software

**2021–present**: Patch and work on a range join algorithm for PostgreSQL (`http://tpg.inf.unibz.it/project-rmj`). Ongoing work.

**2016–present**: Patch and work on PostgreSQL to provide temporal query processing capabilities with range types (`http://tpg.inf.unibz.it`). Ongoing work.

**2018**: Bug fix patch for PostgreSQL to prevent memory leakage with SP-GiST indices (`https://commitfest.postgresql.org/17/1555/`). Integrated into the PostgreSQL release in May 2018 (`https://www.postgresql.org/docs/9.6/static/release-9-6-9.html`).

# Training Courses

**2015**: Academic Teaching Excellence - English as a Medium of Instruction, British Council, September 28 - October 2, 2015 (35h), Free University of Bozen-Bolzano, Bozen, Italy.

**2012**: Teaching in English in a non-English speaking environment, September 24 and October 15, 2012 (14h), University of Zurich, Zurich, Switzerland.

# Teaching Activity

## Courses

**2024, 2025**: *Applied Informatics* (BSc level), Faculty of Agricultural, Environmental and Food Sciences, Free University of Bozen-Bolzano, Bozen, Italy

**2024, 2025**: *Data Management and Business Intelligence* (MSc level), Faculty of Engineering, Free University of Bozen-Bolzano, Bozen, Italy

**2022, 2023**: *Applied Informatics* (BSc level), Faculty of Science and Technology, Free University of Bozen-Bolzano, Bozen, Italy

**2021, 2022, 2023**: *Data Management Technologies* (MSc level), Faculty of Computer Science, Free University of Bozen-Bolzano, Bozen, Italy

**2021**: *Informatics II (Data Structures and Algorithms)* (BSc level - assessment course $\approx$ 280 students), University of Zurich, Switzerland

**2019, 2020**: *Advanced Database Management Technologies* (MSc level), Faculty of Computer Science, Free University of Bozen-Bolzano, Bozen, Italy

**2019, 2020**: *Research Methods – Empirical/experimental CS research methods* (PhD level), Faculty of Computer Science, Free University of Bozen-Bolzano, Bozen, Italy

**2019**: *Database Management Systems* (BSc level), Faculty of Computer Science, Free University of Bozen-Bolzano, Bozen, Italy

**2016, 2017, 2018**: *Temporal and Spatial Database* (MSc level, together with Vincenzo Del Fatto), Faculty of Computer Science, Free University of Bozen-Bolzano, Bozen, Italy

**2015**: *Temporal and Spatial Database* (BSc level), Faculty of Computer Science, Free University of Bozen-Bolzano, Bozen, Italy

## Teaching Assistant

**2019**: *Database Management Systems* (BSc level), Faculty of Computer Science, Free University of Bozen-Bolzano, Bozen, Italy

**2016, 2017, 2018, 2019, 2020**: *Advanced Database Management Technologies* (MSc level), Faculty of Computer Science, Free University of Bozen-Bolzano, Bozen, Italy; held by Prof. Johann Gamper.

**2010, 2011, 2012, 2013, 2014**: *Database Systems* (BSc level), Department of Informatics, University of Zurich, Zurich, Switzerland; held by Prof. Michael H. Böhlen.

**2012**: *Nonstandard Database Systems* (MSc level), Department of Informatics, University of Zurich, Zurich, Switzerland; held by Prof. Michael H. Böhlen.

**2011**: *Distributed Database Systems* (BSc level), Department of Informatics, University of Zurich, Zurich, Switzerland; held by Prof. Michael H. Böhlen.

## Student Advisor

### PhD students

**2023-present**: Saifullah Burero
Topic: *Analyzing Time Series With Contextual Data.*

**2015-2020**: Giovanni Mahlknecht, co-advised with Prof. Johann Gamper.
Topic: *Temporal Aggregation for Data Analytics.*

**2017-2018**: Michael Shekelyan, co-advised with Prof. Johann Gamper.
Topic: *Reliable Multidimensional Data Summaries Using Histograms.*

### MSc/BSc theses

**2024**: MSc thesis by Aditya Iftikar Riaddy.
Title: *A Greedy Algorithm for Ingredient Substitution using a Graph-Based Recipe Model.*

**2023**: MSc thesis by Marcelo Eduardo Redoschi.
Title: *Extraction of Time Series Features from Heterogeneous Data.*

**2022**: BSc thesis by Deivid Bardhi.
Title: *Predictive maintenance for industrial equipment - an experimental evaluation.*

**2022**: MSc thesis by Xiaozhe Yao (University of Zurich), co-advised with Prof. Michael H. Böhlen and Qing Chen.
Title: *Implementing Learned Cardinality Estimation in a Database Systems Context.*

**2021**: MSc thesis by Aristea Ibershimi, co-advised with Prof. Johann Gamper.
Title: *A Data Warehouse Solution to Support the Analysis of Amazon Seller Data.*

**2021**: MSc thesis by Alessandro Dal Gobbo, co-advised with Prof. Johann Gamper.
Title: *An Analytical Software for Amazon Sellers.*

**2020**: MSc thesis by Silvia Fracalossi.
Title: *Time Series Data Management: An Analysis of Databases for a Use Case of Industrial Printers' Sensor Data.*

**2020**: MSc thesis by Jamal Mohammed, co-advised with Prof. Johann Gamper.
Title: *Transfer Learning for Failure Prediction using Approximately Bayesian Ensembling of Neural Networks.*

**2020**: BSc thesis by Thomas Mannhart (University of Zurich), co-advised with Prof. Michael H. Böhlen.
Title: *Range Merge Join in PostgreSQL.* Awarded with the semester prize of the University of Zurich( `https://www.ifi.uzh.ch/en/news/Mannhart-semester-award.html`).

**2020**: BSc thesis by Manuel Pillon.
Title: *Optimising Energy Efficiency of Pumping Stations.*

**2020**: BSc thesis by Ulrike Niederstätter.
Title: *User-Friendly Data Analytics: An Interactive Map of South Tyrol to Visualise & Analyse Hail-Damage.*

**2020**: BSc thesis by Andriy Polulyakh.
Title: *Anomaly detection in time series data using one-class classifier.*

**2017**: BSc thesis by Matthias Keim.
Title: *Automated Traffic Sign Recognition for Street Videos.*

**2017**: MSc thesis by Peter Moser, co-advised with Prof. Johann Gamper.
Title: *Range Merge Joins for Temporal Data.*

**2015**: MSc thesis by Kevin Wellenzohn, co-advised with Prof. Johann Gamper.
Title: *Imputation of Missing Values in Highly Correlated Streams of Time Series Data.*

**2015**: BSc thesis by Tobias Bernard, co-advised with Prof. Johann Gamper.
Title: *Interactive Visualization of Temperature Data Over Time.*

**2013**: BSc thesis by Oliver Leumann, co-advised with Prof. Michael H. Böhlen.
Title: *Query Compilation of Statement Modifiers.*

**2012**: BSc thesis by Jonas Schmid, co-advised with Prof. Michael H. Böhlen.
Title: *Implementation and Evaluation of a Key-Value Store for Flash-based Storage.*

**Others**

**2022**: MSc capstone project by Marcelo Eduardo Redoschi.
Title:*An exploration of industrial printers' data.*

**2020**: MSc capstone project by Oscar Ricardo Cuéllar Rodríguez and Luqman Muhammad Shoaib.
Title:*Predictive maintenance for printer pumps.*

**2020**: MSc capstone project by Adam Harmanec.
Title:*Predictive maintenance for printer pumps.*

**2013**: Term paper (Facharbeit) by Michael Hartmann, co-advised with Prof. Michael H. Böhlen.
Title: *Implementation of a relational algebra based graphical user-interface for the execution of temporal queries.*

**2013**: Term paper (Facharbeit) by Marius Wolfensberger, co-advised with Prof. Michael H. Böhlen.
Title: *Quadtrees.*

**2013**: Self-Study (Vertiefung) by Oliver Leumann, co-advised with Prof. Michael H. Böhlen.
Title: *SQL Mapping of Statement Modifiers.*

**2011**: Term paper (Facharbeit) by Ekateriana Kuleshova, co-advised with Prof. Michael H. Böhlen.
Title: *Provenance in Temporal Databases.*

**2011**: Self-Study (Vertiefung) by Jonas Schmid, co-advised with Prof. Michael H. Böhlen.
Title: *A Database System's Storage Layer Implementation.*

# Talks

**2025**: *Processing Temporal Data.* Seminar at Paris Lodron University of Salzburg, Salzburg, Austria.

**2023**: *Making a career in science. Stories from professors.* Realgymnasium "Peter Anich" talk at Free University of Bozen-Bolzano, Bozen, Italy.

**2023**: *Indexing Temporal Relations for Range-Duration Queries.* SSDBM, Los Angeles, CA, USA.

**2022**: *Temporal Data Management in Postgres.* SFScon22, Free Software Conference, Bozen, Italy.

**2022**: *Temporal Data Management in Postgres.* Software Developers' Thursday, NOI Techpark Südtirol / Alto Adige, Bozen, Italy.

**2022**: *Machine Learning for Quality Measures Prediction.* RobuSinter Workshop, GKN Sinter Metals, Sand in Taufers, Italy.

**2021**: *Relational Model and ER Mapping.* Istituto Istruzione Secondaria Superiore Gandhi Merano (Online lecture).

**2021**: *ER Modelling.* Istituto Istruzione Secondaria Superiore Gandhi Merano (Online lecture).

**2020**: *Anfrageoptimierung in PostgreSQL. (EN: Query optimization in PostgreSQL)* INNOS GmbH, Lienz, Austria (Webinar series).

**2019**: *Database Technology Landscape in South Tyrol — Which databases are we using in South Tyrol?* SFScon19, Free Software Conference, Bozen, Italy.

**2019**: *Snapshot Semantics for Temporal Multiset Relations.* VLDB, Los Angeles, CA, USA.

**2019**: *Period Index: A Learned 2D Hash Index for Range and Duration Queries.* SSTD, Vienna, Austria.

**2014**: *Overlap Interval Partition Join.* SIGMOD Conference, Snowbird, UT, USA.

**2013**: *Towards a Temporal PostgreSQL.* SFScon13, Free Software Conference, Bozen, Italy.

**2012**: *Temporal Alignment.* DIS Seminar Series, Free University of Bozen-Bolzano, Bozen, Italy.

**2012**: *Temporal Alignment.* SIGMOD Conference, Scottsdale, AZ, USA.

**2011**: *Curbing Time Intervals in Database Systems.* DIS Seminar Series, Free University of Bozen-Bolzano, Bozen, Italy.

June 1, 2025 Anton Dignös