

Dimosthenis Pasadakis

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🎓 Scholar profile



Current occupation

- Since 09/2025 **Lecturer**, Università della Svizzera italiana (USI), Faculty of Informatics, Institute of Computing, Lugano, Switzerland, <http://usi.to/vh8>.
- Currently lecturing **Data analytics for fraud detection** (MSc, PhD) and **Emerging topics in advanced computing** (PhD).
- Since 03/2023 **Postdoctoral fellow**, Università della Svizzera italiana (USI).
- My research focuses on high-performance computing algorithms for graphs learning from large-scale data, and on combinatorial and continuous optimization methods for graph partitioning, clustering, and anomaly detection.
- Since 06/2023 **Chief Operating Officer (COO)**, Panua Technologies Sagl, Lugano, Switzerland, <https://panua.ch>.
- Company based in Lugano that creates customized high-end software solutions for large-scale prediction, simulation, optimization, and graph analytics.

Education

- 09/2018 – 02/23 **Doctor of Philosophy in Computational Science**, Università della Svizzera italiana (USI). Supervisor: Olaf Schenk.
Thesis: Learning and clustering graphs from high dimensional data.
- 2015 – 2017 **Master of Science in Computational Science**, USI - Magna cum laude.
Thesis: A three dimensional fluid-structure interaction approach for the simulation of the human heart based on an embedded boundary method.
- 2009 – 2015 **Degree of Physics**, Aristotle University of Thessaloniki (AUTH), Greece.
Thesis: Post-Chernobyl ^{137}Cs in the atmosphere of Thessaloniki.

Projects & grants

- 2025 **[PI]** Huawei Zürich Research Center, Research grant: Directed acyclic graph partitioning for scheduling tasks. Sole investigator, Amount: 120,000 USD.
- 2023 **[PI]** Danish Data Science Academy (DDSA) Research visit grant number: 2023-1855. Sole investigator, Amount: 15,000 DKK.

Academic visits

- 03/2025 – 04/2025 **Research visit**, Huawei Technologies Research Center, Zürich.
- 10/2023 – 12/2023 **Research visit**, Dpt. of Mathematical Sciences, Aalborg University, Denmark.
- 10/2021 – 11/2021 **Research visit**, Huawei Technologies Research Center, Zürich.
- 2013 – 2014 **Exchange program**, Mathematics and Natural Sciences, TU Berlin, Germany.



Teaching experience

- 2025 - ongoing **Data analytics for fraud detection**, Computational Science, Financial Technology and Computing (MSc, PhD), 3 ECTS, USI. [Course website](#)
- 2024, 2025 - ongoing **Emerging topics in advanced computing**, Informatics (PhD), 2 ECTS, USI. [Course website](#)
- 2023 **Numerical Computing**, Informatics (BSc), 6 ECTS, USI.
 - Teaching assistant in the courses: High-Performance Computing Lab for CSE (BSc, ETH Zürich), High Performance Computing (MSc, USI), Software Atelier (MSc, USI), Linear Algebra (BSc, USI).

Prizes & awards

- Outstanding paper awards at IEEE High Performance Extreme Computing Conference HPEC'23, IEEE HPEC'24.
- Best paper award at Springer Mediterranean Geosciences Union MedGU'22.
- Best poster awards at ACM Platform for Advanced Scientific Computing PASC'16, ACM PASC'18, IEEE Swiss Conference on Data Science SDS'24, IEEE International Conference on Cluster Computing CLUSTER'25.

Software

- **Open source software:** In Matlab, R, python, and C++ on Github  and Gitlab , dmpas.github.io/software/.
- **Panua Technologies:** Sparse symmetric and unsymmetric linear solver Panua-Pardiso <https://panua.ch/pardiso/> and nonlinear optimizer Panua-Ipopt <https://panua.ch/ipopt/>.

Service

- **Minisymposia organizer:** ① Scalable numerical algorithms and graph analytics for large-scale applications at SIAM Parallel Processing for Scientific Computing (PP'26), Berlin, ② Learning and clustering tasks on graphical structures at SIAM Conference on Applied Linear Algebra (LA'24), Paris, ③ High performance graph analytics at ACM PASC'24, Zürich, ④ Chair of ACM Papers Session 1B at the PASC'22, Basel.
- **Reviewer:** SIAM Journal on Scientific Computing (SISC), Bayesian Analysis (BA), Linear Algebra and its Applications (LAA), International Journal of Data Science and Analytics (IJDSA), Statistics and Computing (Stat and Comp).
- **Scientific committee:** IEEE Swiss Conference on Data Science (SDS).

Languages

- English (full proficiency), German (C1 - Goethe Mittelstufeprüfung), Italian (B1 - FIDE), Greek (native speaker).

References

- **Academic:** ① Prof. Dr. Olaf Schenk, Institute of Computing (CI), USI Lugano, olaf.schenk@usi.ch, <http://usi.to/ovv> ② Prof. Dr. Matthias Bollhöfer, Carl-Friedrich-Gauss-Dept., TU Braunschweig, m.bollhoefer@tu-bs.de, <http://www.icm.tu-bs.de/bolle/>
- **Industrial:** ① Dr. Madan Sathe, Partner, Forensics, Deloitte AG, Zürich, msathe@deloitte.ch, [personal website](#) ② Dr. Albert-Jan N. Yzelman, Computing Systems Laboratory, Huawei Zürich Research Center, albert-jan@yzelman.net, <http://albert-jan.yzelman.net/>

Supervised student thesis

A complete list of all students, together with the outcome of their work is available at: dmpas.github.io/teaching/.

- PhD in Computational Science, M. Lechekhab, Multilevel diffusion-based graph methods for clustering and anomaly detection, USI, 2026, <https://n2t.net/ark:/12658/srd1335226>.

- MSc in High Performance Computing Engineering, J. Palumbo, Spectral embeddings for directed graph clustering, USI and Politecnico di Milano (Polimi), 2025.
- MSc in Informatics, C. Ricci, Using time-series clustering for a better financial crime segmentation model, USI and Università degli Studi di Milano-Bicocca (UniMiB), 2025.
- MSc in Artificial Intelligence, J. Schmidt, Detecting financial fraud using graph neural networks, USI, 2023.
- BSc in Informatics, L. Najdenov, A study of spectral clustering techniques for machine learning applications, USI, 2020.
- Five semester projects at USI (MSc of Computational Science) and ETH Zürich (MSc in Computational Science and Engineering).

List of publications

The full list is also available at: dmpas.github.io/publications/ and at my [scholar profile](#).

Journal articles

- D. V. Rodriguez, S. Omlin, D. Pasadakis, and O. Schenk, Generating Architecture-Agnostic Performance Tests from Functional Unit Tests, *ACM Transactions on Modeling and Performance Evaluation of Computing Systems*, 11, 1–2, Article 16, 2026, doi: [10.1145/3801098](https://doi.org/10.1145/3801098).
- A. Eftekhari, L. Gaedke-Merzhäuser, D. Pasadakis, M. Bollhöfer, S. Scheidegger, and O. Schenk, Algorithm 1042: Sparse Precision Matrix Estimation With SQUIC, *ACM Transactions of Mathematical Software*, 50, 2, Article 13, 2024, doi: [10.1145/3650108](https://doi.org/10.1145/3650108).
- D. Pasadakis, M. Bollhöfer, and O. Schenk, Sparse Quadratic Approximation for Graph Learning, *IEEE Transactions on Pattern Analysis and Machine Intelligence*, vol. 45, no. 9, pp. 11256–11269, 1 Sept. 2023, doi: [10.1109/TPAMI.2023.3263969](https://doi.org/10.1109/TPAMI.2023.3263969).
- D. Pasadakis, C. L. Alappat, O. Schenk, and G. Wellein, Multiway p-spectral graph cuts on Grassmann manifolds, *Machine Learning* 111, 791–829, 2022, doi: [10.1007/s10994-021-06108-1](https://doi.org/10.1007/s10994-021-06108-1).
- A. Eftekhari*, D. Pasadakis*, M. Bollhöfer, S. Scheidegger, and O. Schenk, Block-enhanced precision matrix estimation for large-scale datasets, *Journal of Computational Science*, vol. 53, 2021, doi: [10.1016/j.jocs.2021.101389](https://doi.org/10.1016/j.jocs.2021.101389)

Conference papers

- D. Pasadakis, R. S. Steiner, P. A. Papp, T. Böhnlein, and A.-J. N. Yzelman, Brief announcement: Direction-incentivized spectral partitioning for acyclic graphs, in *Proceedings of the 38th on Symposium on Parallelism in Algorithms and Architectures*, ser. SPAA '26. New York, NY, USA: ACM, Accepted, in press, 2026, doi: [10.1145/3816782.3819184](https://doi.org/10.1145/3816782.3819184).
- L. Losavio, L. Persia, M. Sathe, and D. Pasadakis, Fraud detection in cryptocurrency markets with spatio-temporal graph neural networks, in *13th IEEE Swiss Conference on Data Science (SDS)*, Accepted, in press, 2026, doi: [10.48550/arXiv.2604.24590](https://doi.org/10.48550/arXiv.2604.24590).
- X. Niu, G. Meyer, D. Pasadakis, A. -J. Yzelman and O. Schenk, Incremental sparse tensor format for maximizing efficiency in tensor-vector multiplications, in *IEEE International Conference on Cluster Computing Workshops (CLUSTER)*, 2025, doi: [10.1109/CLUSTERWorkshops65972.2025.11164206](https://doi.org/10.1109/CLUSTERWorkshops65972.2025.11164206).
- M. Lechekhab, D. Pasadakis, and O. Schenk, Multilevel diffusion based spectral graph clustering, in *2024 IEEE High Performance Extreme Computing Conference (HPEC)*, Wakefield, MA, USA, pp. 1-7, 2024, doi: [10.1109/HPEC62836.2024.10938528](https://doi.org/10.1109/HPEC62836.2024.10938528).
- J. Schmidt, D. Pasadakis, M. Sathe, and O. Schenk, GAMLNet: a graph based framework for the detection of money laundering, in *11th IEEE Swiss Conference on Data Science (SDS)*, Zurich, Switzerland, 2024, doi: [10.1109/SDS60720.2024.00043](https://doi.org/10.1109/SDS60720.2024.00043).
- V.I. Makri and D. Pasadakis, The clustering of source rocks: A spectral approach, in *Mediterranean Geosciences*

Union, MedGU, March 2024, doi: [10.1007/978-3-031-48758-3_72](https://doi.org/10.1007/978-3-031-48758-3_72)

- D. Pasadakis, O. Schenk, V. Vlacic, and A.-J. Yzelman, Nonlinear spectral clustering with C++ GraphBLAS, IEEE High Performance Extreme Computing Conference (HPEC), Wakefield, MA, USA, 2023, doi: [10.48550/arXiv.2605.26975](https://doi.org/10.48550/arXiv.2605.26975).
- V.I. Makri, D. Pasadakis, and N. Pasadakis, A novel chemometric approach for oil & source rock clustering, in European Association of Geoscientists & Engineers, IMOG, 2023, doi: [10.3997/2214-4609.202333183](https://doi.org/10.3997/2214-4609.202333183).
- T. Simpson, D. Pasadakis, D. Kourounis, K. Fujita, T. Yamaguchi, T. Ichimura, and O. Schenk, Balanced graph partition refinement using the graph p-Laplacian, in Proceedings of the Platform for Advanced Scientific Computing Conference, ser. PASC'18, NY, USA: ACM, 2018, doi: [10.1145/3218176.3218232](https://doi.org/10.1145/3218176.3218232)

Preprints

- C. Kodsí and D. Pasadakis, Nonlinear PageRank problem for local graph partitioning, 2025, <https://arxiv.org/abs/2409.01834>.
- D. Pasadakis, R. S. Steiner, P. A. Papp, T. Böhnlein, and A.-J. Yzelman, Symmetry-breaking symmetry in directed spectral partitioning, 2025, <https://arxiv.org/abs/2508.16173>.
- M. Lechekhab, D. Pasadakis, Roger Käppeli, A. Eftekhari, and O. Schenk, GraphLab.jl: A Julia Framework for Graph Partitioning, 2026, [Preprint link](#).

PhD Thesis

- D. Pasadakis, Learning and clustering graphs from high dimensional data, PhD thesis, Università della Svizzera italiana, 2023, <https://n2t.net/ark:/12658/srd1324640>.

Selected conference & seminar talks

- (invited) Large-scale graph estimation and spectral anomaly detection, Complexity Science Hub, Vienna, Austria, June 03, 2026.
- (invited) An introduction to linear and non-linear spectral clustering, Siebel School of Computing and Data Science, University of Illinois Urbana-Champaign, USA, April 7, 2026.
- (invited) Multilevel anomaly detection in large-scale directed graphs, SIAM Conference on Parallel Processing for Scientific Computing (PP), Zuse Institute, Berlin, Germany, Mar. 03, 2026.
- (invited) Graph learning and community detection in large-scale data, Aristotle University Research Dissemination Center, Thessaloniki, Greece, Feb. 18, 2026.
- (invited) Governance and development of AI, principles in practice, Academy & Finance, Hôtel Président Wilson, Geneva, December 3, and Sheraton Hotel, Zurich, Switzerland, Dec. 10, 2025.
- Symmetry-breaking symmetry in directed spectral partitioning, Networks for Science, David Brower Center, Berkeley, CA, USA, Nov. 5, 2025.
- (invited) Graph learning and spectral clustering in high dimensional data, Duke Computer Science Colloquium, Durham, NC, USA, July 21, 2025.
- Graph analytics and machine learning for anomaly detection in financial transactions, SIAM Conference on Financial Mathematics and Engineering (FM), Miami, USA, July 2025.
- Graph-based anomaly detection in financial transactions, Vienna Congress on Mathematical Finance (VCMF), Vienna, Austria, July 2025.
- (invited) Artificial intelligence and compliance processes, Academy & Finance seminar, Hôtel Président Wilson, Geneva, Nov. 2024, and Zürich Sheraton Hotel, Switzerland, Mar. 2025.
- (invited) Graph analytics and machine learning for anomaly detection in financial transactions, The power of graph technology in financial crime, Deloitte Zürich, Switzerland, Oct. 2024.

- (invited) Graph adjacency matrix estimation via maximum likelihood, SIAM Conference on Applied Linear Algebra (LA), Sorbonne, Paris, France, May 2024.
- Learning graph Laplacian matrices via maximum likelihood, Swiss Numerics Day (SND), University of Bern, Switzerland, Sep. 2023.
- (invited) Sparse quadratic approximation for graph learning, Platform for Advanced Scientific Computing Conference (ACM PASC), Congress Center Basel, Switzerland, July 2022.
- Multiway p-spectral graph cuts on Grassmann manifolds, Swiss Numerics Day (SND), EPFL, Lausanne, Switzerland Sep. 2021.
- (invited) Multiway p-spectral clustering on Grassmann manifolds, SIAM Conference on Applied Linear Algebra (LA), New Orleans, USA, May 2021.
- Spectral graph partition refinement using the graph p-Laplacian, International Conference on Continuous Optimization (ICCOPT), Technical University (TU), Berlin, Germany, Aug. 2019.
- (invited) Improvement of graph partitions using the graph p-Laplacian, Platform for Advanced Scientific Computing Conference (ACM PASC), Congress Center Basel, Switzerland, July 2018.
- (invited) Balanced graph partition refinement using the graph p-Laplacian, SIAM Conference on Parallel Processing for Scientific Computing (PP), Waseda University, Tokyo, Japan, Mar. 2018.
- A historical perspective of graph theory, Seminar talk, Academic Teaching, USI, Lugano, Switzerland, Nov. 2018.
- (invited) Fluid-structure interaction simulations of the human heart, Seminar talk, ARTORG Center for Biomedical Engineering, University of Bern, Switzerland, Sep. 2017.