Dimosthenis Pasadakis

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Scholar profile
Dimosthenis-Pasadakis
Date of birth: July 29, 1991
Birthplace: Thessaloniki, Greece

Research focus

Development of efficient and accurate routines for the learning of large-scale graphs, and the utilization of these graphical structures in partitioning and clustering tasks.

Current occupation

Since 03/2023 **Postdoctoral fellow**, Università della Svizzera italiana (USI), Faculty of Informatics, Institute of Computing, Lugano, Switzerland.

Education

11/2023 – 12/2023 **Research visit**, Aalborg University, Denmark.

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.

10/2021 – 11/2021 **Research visit**, Huawei Technologies Research Center, Zürich.

2017–2018 **Research assistant**, USI, Lugano.

2016–2017 **Student researcher**, USI, Lugano.

2015–2017 **Master of Science in Computational Science**, USI. Honors: *Magna cum laude*.
Thesis: *A three dimensional fluid-structure interaction approach for the simulation of the human heart based on an embedded boundary method.*

02013–2014 **Exchange program**, Technical University (TU) Berlin, Germany.

2009–2015 **Diploma of Physics**, Aristotle University of Thessaloniki (AUTH), Greece. Honors: *Very good*.
Thesis: *Post-Chernobyl ^{137}Cs in the atmosphere of Thessaloniki.*

Grants

2023 *Danish Data Science Academy (DDSA) Research Visit*, Grant number: 2023-1855. Amount awarded: 15000 DKK.

Co-supervised student projects

2023 J. Schmidt, *Detecting financial fraud using graph neural networks*, MSc thesis, Faculty of Informatics, USI Lugano, and poster submission to the PASC'23 conference, Davos, Switzerland.

2022 K. Szenes, *Spectral clustering using a multilevel approach*, Semesterarbeit, Computational Science and Engineering MSc programme, ETH Zürich.

2020 L. Najdenov, *A study of spectral clustering techniques for machine learning applications*, BSc thesis, Faculty of Informatics, USI Lugano.

2019 L. Karagyaur, V. Braglia, and L. Ferri, *A high performance video segmentation framework*, Semester project, MSc of Computational Science, USI Lugano.

2018 E. Barnett, S. Gyanchandani, and S. Rawat, *High performance topology optimization*, Semester project, MSc of Computational Science, USI Lugano, and poster submission to the PASC'18 conference, Basel, Switzerland.

Teaching experience

2023 **Numerical Computing (instructor)**, Format: lab course & lectures, audience: Informatics (Bachelor). USI Lugano.

2020 – 2023 **High-Performance Computing Lab for CSE (assistant)**, Format: lab course & lectures, audience: Computational Science and Engineering (Bachelor). ETH Zürich.

2018 – 2022 **Numerical Computing (assistant)**, Format: lab course & lectures, audience: Informatics (Bachelor). USI Lugano.

2019 – 2021 **High Performance Computing (assistant)**, Format: lab course & lectures, audience: Computational Science (Master). USI Lugano.

2020 **Linear Algebra (assistant)**, Format: lab course & lectures, audience: Informatics (Bachelor). USI Lugano.

Software

2023 **pGrass**, Nonlinear spectral clustering in the p-norm. www.doi.org/10.5281/zenodo.7937142.

2022 **SQUIC**, Estimating large-scale sparse precision matrices. www.gitlab.ci.inf.usi.ch/SQUIC.

List of publications

Note: Equal contribution is denoted by an asterisk (*). The list is in reversed chronological order.

Journal articles

- A. Eftekhari, L. Gaedke-Merzhäuser, D. Pasadakis, M. Bollhöfer, S. Scheidegger, and O. Schenk, *Algorithm XXX: Sparse Precision Matrix Estimation With SQUIC,* ACM Transactions of Mathematical Software, March 2024.
- D. Pasadakis, M. Bollhöfer, and O. Schenk, *Sparse quadratic approximation for graph learning*, IEEE Transactions on Pattern Analysis and Machine Intelligence, April 2023.
- D. Pasadakis, C. L. Alappat, O. Schenk, and G. Wellein, *Multiway p-spectral graph cuts on Grassmann manifolds*, Machine Learning 111, 791–829, 2022.
- 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.

Conference papers

- D. Pasadakis, O. Schenk, V. Vlacic, and A.-J. Yzelman, *Nonlinear spectral clustering with C++ GraphBLAS*. IEEE High Performance Extreme Computing Conference, 25 - 29 September 2023.
- 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.
- 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. New York, NY, USA: ACM, 2018.

Selected posters

- D. Pasadakis, D. Kourounis, and O. Schenk, *Balanced graph partition refinement in the p-norm*, International Conference on Continuous Optimization (ICCOPT'19), 2019.
- D. Pasadakis, D. Kourounis, and O. Schenk, *Spectral graph partitioning in the p-norm*, in Computational Science at Scale (CoSaS'18), 2018.
- D. Pasadakis, M. Nestola, F. Maffessanti, B. Becsek, D. Obrist, R. Krause, *Fluid-structure interaction simulations of the heart*, in Platform for Advanced Scientific Computing Conference (PASC'17), 2017.
- D. Pasadakis, D. Kourounis, and O. Schenk, *Estimation of drag and lift coefficients for steady state incompressible flow of a newtonian fluid on domains with periodic roughness*, in Platform for Advanced Scientific Computing Conference (PASC'16), 2016.

Conference & seminar talks

- *Learning graph Laplacian matrices via maximum likelihood*. Swiss Numerics Day (SND), University of Bern, Switzerland 2023.
- *Sparse quadratic approximation for graph learning*. 2022, June 29; Platform for Advanced Scientific Computing Conference (PASC'22), Congress Center Basel, Switzerland.
- *Multiway p-spectral graph cuts on Grassmann manifolds*. 2021, September 13; Swiss Numerics Day (SND'21), EPFL, Lausanne, Switzerland.
- *Multiway p-spectral clustering on Grassmann manifolds*. 2021, May 17; SIAM Conference on Applied Linear Algebra (LA'21), virtual event, New Orleans, USA.
- *Spectral graph partition refinement using the graph p-Laplacian*. 2019, August 08; International Conference on Continuous Optimization (ICCOPT'19), Technical University (TU), Berlin, Germany.
- *Improvement of graph partitions using the graph p-Laplacian*. 2018, July 3; Platform for Advanced Scientific Computing Conference (PASC'18), Congress Center Basel, Switzerland.
- *Balanced graph partition refinement using the graph p-Laplacian*. 2018, March 9; SIAM Conference on Parallel Processing for Scientific Computing (SIAM PP18), Waseda University, Tokyo, Japan.
- *Fluid-structure interaction simulations of the human heart*. 2017, September 28; Seminar Talk, ARTORG Center for Biomedical Engineering, University of Bern, Switzerland.

Outreach

- Our article *Multiway p-spectral graph cuts on Grassmann manifolds* featured in the December 2021 newsletter of the National Centre for High Performance Computing of the University of Erlangen (NHR@FAU). Newsletter link

Service

- Organizing the minisymposium *Learning and Clustering Tasks on Graphical Structures* at SIAM LA 24 in Paris.
- Organizing the minisymposium *High Performance Graph Analytics* at PASC 24 in Zürich.
- Chair of ACM Papers Session 1B at the PASC'22 conference.
- Reviewer for the journals SIAM scientific computing (SISC), Bayesian Analysis (BA), and Linear Algebra and its Applications (LAA).

Prizes & awards

- Outstanding short paper award, IEEE HPEC 2023.
- Best poster award, 3rd place runner-up, PASC'18, Basel, Switzerland.
- Best poster award in Computer Science and Applied Mathematics, PASC'16, Lausanne, Switzerland.