

Giorgis Georgakoudis

Curriculum Vitae – June 2023

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Education

- 09/2010 – **PhD in Comp. Eng., University of Thessaly (GR),**
03/2017 GPA 10/10 (Excellent),
Dissertation: “Scheduling and Performance Characterization on Heterogeneous Computing Systems”.
Supervisors: Prof. Dimitrios S. Nikolopoulos, Prof. Spyros Lalis, Prof. Christos Antonopoulos
- 02/2008 – **Master’s Degree in Comp. Eng., University of Thessaly (GR),**
06/2009 GPA 8.75/10 (Excellent).
- 02/2002 – **Diploma in Comp. Eng., University of Thessaly (GR),**
09/2007 GPA 7.26/10 (Very Good).

Research experience

- 11/2018 – **Lawrence Livermore National Laboratory (USA), Computer Scientist (02/2020 – present),**
present *Postdoctoral Researcher (11/2018 – 02/2020).*
Current projects
 - LDRD 21-ERD-018, Achieving Peak Performance of High-Performance Computing Applications by Optimizing Parallelism Compilation (PI)
 - LDRD 22-ERD-041, High-Performance Computing Force Multiplier: Leading the Way for Extreme-Scale Converged Computing (Col)
 - LDRD 23-ERD-022, Localizing and Explaining Performance Defects in Heterogeneous Applications (Col)
 - NNSA ASC ATDM, Apollo: Fast, Lightweight, Dynamic Tuning for Data-Dependent Code (Col)
 - RAPIDS2: A SciDAC Institute for Computer Science, Data, and Artificial Intelligence (Col)
- 09/2016 – **Queen’s University Belfast (UK), Research Fellow.**
11/2018 “SERT: Scale-free, Energy-aware, Resilient and Transparent Adaptation of CSE Applications to Mega-core Systems”,
funded by EPSRC, Reference: EP/M01147X/1
“Open transPREcision COMputing (OPRECOMP)”, funded by EU H2020, grant 732631
- 11/2016 – **Lawrence Livermore National Laboratory (USA), Research Intern.**
03/2017 “REFINE: Realistic Fault Injection for Accuracy, Portability and Speed”
Supervisors: Ignacio Laguna, Martin Schulz
- 01/2013 – **Queen’s University Belfast (UK), Research Assistant.**
08/2016 “NanoStreams: A Hardware and Software Stack for Real-Time Analytics on Fast Data Streams (NanoStreams)”, funded
by EU under FP7-ICT, Project reference: 610509
“GreenEr Mobile Systems by Cross Layer Integrated energy Management (GEMSCLAIM)”, funded by EPSRC, Reference:
EP/K017594/1
- 11/2007 – **Center for Research & Technology Hellas (CERTH) (GR), Research Assistant.**
04/2011 “Platform for Opportunistic Behavior in Incompletely Specified, Heterogeneous Object Communities (POBICOS)”,
funded by EU, Contract No: INFSo-ICT-223984
“Wearable computing for injury detection”, funded by General Secretariat for Research and Technology (GSRT), GR

Funding

- 2020 LDRD Exporatory Research (3 years) Optimizing Parallelism Compilation, \$1.6M
2019 LDRD Feasibility Study Optimizing Performance Through Parallelism-Aware Compilation, \$150K

Honors and Awards

- 2021 **Best reproducibility** award, SC'21
- 2020 **Best paper** award, IWOMP 2021
- 2020 **SPOT LLNL** award for exemplary leadership and teamwork on the Apollo project
- 2020 **Best paper** award, IWOMP 2020
- 2020 **Best paper** award in track Test and Dependability, DATE 2020
- 2017 **Discretionary Award for Exceptional Performance**, Queen's University Belfast (UK)
- 2013 **Best paper** award, COSMIC'13 (CGO)

Invited Talks

- HiPEAC'18** REFINE: A Compiler Based Tool to Simulate Faults at Scale, Post-Exascale Workshop, Manchester, UK
- HiPEAC'14** Informed Dynamic Scheduling On Shared-ISA Heterogeneous MPSoCs, Computing Systems Week, Athens, Greece

Professional Service

- Professional Societies **IEEE** (Senior Member), **ACM** (Member), **Technical Chamber of Greece** (Member)

Committees and Boards

- Journals **IEEE IT Professional** (Associate Editor) (2023–present), **Frontiers in High Performance Computing** (Review Board) (2023–present)
- Conferences **HPC Asia** (Program Committee) (2022), **CF** (Program Committee) (2020), **ARCS** (Program Committee) (2020), **Euro-Par** (Program Committee) (2022, 2018), **ICS** (Program Committee) (2023), **IISWC** (Program Committee) (2022)
- Workshops **LLPP (ICPP)** (Co-chair) (2022, 2021), **HIPS (IPDPS)** (Program Committee) (2023)
- Grants **NSF Panel Reviewer** (Computer and Information Science and Engineering (CISE), March 2023)

Peer Reviewer

- Journals **IEEE TCC** (2023) **IEEE TPDS** (2022, 2020, 2014), **JPDC** (2015)
- Conferences **IPDPS** (2020, 2017, 2014, 2012), **ICPP** (2016), **ICS** (2017) **EuroPar** (2017 – 2014), **CF** (2017, 2016), **CLUSTER** (2017, 2015), **CCGRID** (2019, 2017), **ICPADS** (2016),
- Workshops **COSMIC (CGO)** (2015), **AsHES (IPDPS)** (2014),

Other

- Google Summer of Code (GSoC)** (Mentor) (2020) **CLUSTER** (Web Chair) (2018, 2022)

Publications

(Google Scholar – Citations: 347, h-index: 10, i10-index: 10)

Conferences

- PACT'22** J. Doerfert, M. Jasper, J. Huber, K. Abdelaal, G. **Georgakoudis**, T. Scogland, and K. Parasyris, “Breaking the Vendor Lock: Performance Portable Programming through OpenMP as Target Independent Runtime Layer,” in *Proceedings of the International Conference on Parallel Architectures and Compilation Techniques*, ser. PACT '22, (acceptance 34% 40/118), Chicago, Illinois: Association for Computing Machinery, 2023, 494–504. DOI: 10.1145/3559009.3569687.
- IPDPS'22** J. Doerfert, A. Patel, J. Huber, S. Tian, J. M. M. Diaz, B. Chapman, and G. **Georgakoudis**, “Co-Designing an OpenMP GPU Runtime and Optimizations for Near-Zero Overhead Execution,” in *2022 IEEE International Parallel and Distributed Processing Symposium (IPDPS)*, (acceptance 26% 123/474), 2022, pp. 504–514. DOI: 10.1109/IPDPS53621.2022.00055.
- CGO'22** J. Huber, M. Cornelius, **Georgakoudis**, **Giorgis**, S. Tian, J. M. M. Diaz, K. Dinel, B. Chapman, and J. Doerfert, “Efficient Execution of OpenMP on GPUs,” in *2022 IEEE/ACM International Symposium on Code Generation and Optimization (CGO)*, (acceptance 27% 27/99), 2022, pp. 41–52. DOI: 10.1109/CGO53902.2022.9741290.

- CCGrid'21** K. Parasyris, G. **Georgakoudis**, L. Bautista-Gomez, and I. Laguna, "Co-Designing Multi-Level Checkpoint Restart for MPI Applications," in *2021 IEEE/ACM 21st International Symposium on Cluster, Cloud and Internet Computing (CCGrid)*, (acceptance 26% 60/230), 2021, pp. 103–112. DOI: 10.1109/CCGrid51090.2021.00020.
- SC21** K. Parasyris, G. **Georgakoudis**, H. Menon, J. Diffenderfer, I. Laguna, D. Osei-Kuffuor, and M. Schordan, "HPAC: Evaluating Approximate Computing Techniques on HPC OpenMP Applications," in *Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis*, ser. SC '21, **Best reproducibility award** (acceptance 25.8% 98/379), St. Louis, Missouri: Association for Computing Machinery, 2021. DOI: 10.1145/3458817.3476216.
- DSN'21** A. Taherin, T. Patel, G. **Georgakoudis**, I. Laguna, and D. Tiwari, "Examining Failures and Repairs on Supercomputers with Multi-GPU Compute Nodes," in *2021 51st Annual IEEE/IFIP International Conference on Dependable Systems and Networks (DSN)*, (acceptance 16.3% 48/295), 2021, pp. 305–313. DOI: 10.1109/DSN48987.2021.00043.
- ISC'21** C. Wood, G. **Georgakoudis**, D. Beckingsale, D. Poliakoff, A. Gimenez, K. Huck, A. Malony, and T. Gamblin, "Artemis: Automatic Runtime Tuning Of Parallel Execution Parameters Using Machine Learning," in *High Performance Computing: 36th International Conference, ISC High Performance 2021, Virtual Event, June 24 - July 2, 2021, Proceedings*, (acceptance 32.4% 24/74), Berlin, Heidelberg: Springer-Verlag, 2021, 453–472. DOI: 10.1007/978-3-030-78713-4_24.
- IISWC'20** L. Guo, G. **Georgakoudis**, K. Parasyris, I. Laguna, and D. Li, "MATCH: An MPI Fault Tolerance Benchmark Suite," in *2020 IEEE International Symposium on Workload Characterization (IISWC)*, (acceptance 37% 26/70), 2020, pp. 60–71. DOI: 10.1109/IISWC50251.2020.00015.
- IISWC'20** K. Parasyris, I. Laguna, H. Menon, M. Schordan, D. Osei-Kuffuor, G. **Georgakoudis**, M. O. Lam, and T. Vanderbruggen, "HPC-MixPBench: An HPC Benchmark Suite for Mixed-Precision Analysis," in *2020 IEEE International Symposium on Workload Characterization (IISWC)*, (acceptance 37% 26/70), 2020, pp. 25–36. DOI: 10.1109/IISWC50251.2020.00012.
- SC20** B. Swain, Y. Li, P. Liu, I. Laguna, G. **Georgakoudis**, and J. Huang, "OMPRacer: A Scalable and Precise Static Race Detector for OpenMP Programs," in *Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis*, ser. SC '20, (acceptance 25% 95/378), Atlanta, Georgia: IEEE Press, 2020.
- ISC'20** G. **Georgakoudis**, L. Guo, and I. Laguna, "Reinit⁺⁺: Evaluating the Performance of Global-Restart Recovery Methods for MPI Fault Tolerance," in *High Performance Computing*, P. Sadayappan, B. L. Chamberlain, G. Juckeland, and H. Ltaief, Eds., (acceptance 31% 27/87), Cham: Springer International Publishing, 2020, pp. 536–554.
- DATE'20** I. Tsiokanos, L. Mukhanov, G. **Georgakoudis**, D. S. Nikolopoulos, and G. Karakonstantis, "Defcon: Generating and detecting failure-prone instruction sequences via stochastic search," in *2020 Design, Automation Test in Europe Conference Exhibition (DATE)*, **Best paper award**, (acceptance 26% 194/748), 2020, pp. 1121–1126.
- HiPC'19** G. **Georgakoudis**, N. Jain, T. Ono, K. Inoue, S. Miwa, and A. Bhatele, "Evaluating the impact of energy efficient networks on hpc workloads," in *2019 IEEE 26th International Conference on High Performance Computing, Data, and Analytics (HiPC)*, (acceptance 23% 39/171), 2019, pp. 301–310.
- IPDPS'19** G. **Georgakoudis**, I. Laguna, H. Vandierendonck, D. S. Nikolopoulos, and M. Schulz, "SAFIRE: Scalable and Accurate Fault Injection for Parallel Multithreaded Applications," in *2019 IEEE International Parallel and Distributed Processing Symposium (IPDPS)*, (acceptance 28% 103/372), 2019, pp. 890–899. DOI: 10.1109/IPDPS.2019.00097.
- SC17** G. **Georgakoudis**, I. Laguna, D. S. Nikolopoulos, and M. Schulz, "REFINE: Realistic Fault Injection via Compiler-based Instrumentation for Accuracy, Portability and Speed," in *Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis*, ser. SC17, (acceptance 19% 61/327), Denver, Colorado: ACM, 2017, 29:1–29:14. DOI: 10.1145/3126908.3126972.
- ARCS'16** M. Marcu, O. Boncalo, M. Ghenea, A. Amaricai, J. Weinstock, R. Leupers, Z. Wang, G. **Georgakoudis**, D. S. Nikolopoulos, C. Cernazanu-Glavan, L. Bara, and M. Ionascu, "Low-Cost Hardware Infrastructure for Runtime Thread Level Energy Accounting," in *Architecture of Computing Systems - ARCS 2016: 29th International Conference, Nuremberg, Germany, April 4-7, 2016, Proceedings*, (acceptance 33% 29/87), Cham: Springer International Publishing, 2016, pp. 277–289. DOI: 10.1007/978-3-319-30695-7_21.
- SAMOS'16** G. **Georgakoudis**, C. Gillan, A. Hassan, U. I. Minhas, I. Spence, G. Tzenakis, H. Vandierendonck, R. Woods, D. S. Nikolopoulos, M. Shyamsundar, P. Barber, M. Russell, A. Bilas, S. Kaloutsakis, H. Giefers, P. Staar, C. Bekas, N. Horlock, R. Faloon, and C. Pattison, "NanoStreams: Codesigned microservers for edge analytics in real time," in *2016 International Conference on Embedded Computer Systems: Architectures, Modeling and Simulation (SAMOS)*, (acceptance 48% 25/52), 2016, pp. 180–187. DOI: 10.1109/SAMOS.2016.7818346.
- SAMOS'14** G. **Georgakoudis**, D. S. Nikolopoulos, H. Vandierendonck, and S. Lalis, "Fast Dynamic Binary Rewriting for flexible thread migration on shared-ISA heterogeneous MPSoCs," in *Embedded Computer Systems: Architectures, Modeling, and Simulation (SAMOS XIV), 2014 International Conference on*, (acceptance: 40% 37/92), 2014, pp. 156–163. DOI: 10.1109/SAMOS.2014.6893207.

- S-CUBE'12** N. Tziritas, G. **Georgakoudis**, S. Lalis, T. Paczesny, J. Domaszewicz, P. Lampsas, and T. Loukopoulos, "Middleware mechanisms for agent mobility in wireless sensor and actuator networks," in *Sensor Systems and Software*, ser. Lecture Notes of the Institute for Computer Sciences, Social Informatics and Telecommunications Engineering, vol. 102, Springer Berlin Heidelberg, 2012, pp. 30–44. DOI: 10.1007/978-3-642-32778-0_3.
- UBICOMM'10** S. Lalis, J. Domaszewicz, A. Pruszkowski, T. Paczesny, M. Ala-Louko, M. Taumberger, G. **Georgakoudis**, and K. Lekkas, "Tangible applications for regular objects: An end-user model for pervasive computing at home," in *UBICOMM 2010, 4th International Conference on Mobile Ubiquitous Computing, Systems, Services and Technologies*, 2010, pp. 385–390.

Journals

- IEEE TC'22** I. Tsiokanos, S. Tompazi, G. **Georgakoudis**, L. Mukhanov, and G. Karakonstantis, "Arete: Accurate error assessment via machine learning-guided dynamic-timing analysis," *IEEE Transactions on Computers*, pp. 1–14, 2022. DOI: 10.1109/TC.2022.3191966.
- CSE'21** T. G. Mattson, T. A. Anderson, and G. **Georgakoudis**, "PyOMP: Multithreaded Parallel Programming in Python," *Computing in Science Engineering*, vol. 23, no. 6, pp. 77–80, 2021, (JCR IF 2.080). DOI: 10.1109/MCSE.2021.3128806.
- IJHPCA'18** C. Chalios, G. **Georgakoudis**, K. Tovletoglou, G. Karakonstantis, H. Vandierendonck, and D. S. Nikolopoulos, "DARE: Data-Access Aware Refresh via spatial-temporal application resilience on commodity servers," *The International Journal of High Performance Computing Applications*, vol. 32, no. 1, pp. 74–88, 2018, (JCR IF 1.956). DOI: 10.1177/1094342017718612.
- IEEE TMCS'17** U. I. Minhas, M. Russell, S. Kaloutsakis, P. Barber, R. Woods, G. **Georgakoudis**, C. Gillan, D. S. Nikolopoulos, and A. Bilas, "NanoStreams: A Microserver Architecture for Real-time Analytics on Fast Data Streams," *IEEE Transactions on Multi-Scale Computing Systems*, vol. PP, no. 99, pp. 1–1, 2017. DOI: 10.1109/TMCS.2017.2764087.
- TACO'17** G. **Georgakoudis**, H. Vandierendonck, P. Thoman, B. R. D. Supinski, T. Fahringer, and D. S. Nikolopoulos, "SCALO: Scalability-Aware Parallelism Orchestration for Multi-Threaded Workloads," *ACM Trans. Archit. Code Optim.*, vol. 14, no. 4, 54:1–54:25, Dec. 2017. DOI: 10.1145/3158643.
- CCPE'16** G. **Georgakoudis**, C. J. Gillan, A. Sayed, I. Spence, R. Faloon, and D. S. Nikolopoulos, "Methods and metrics for fair server assessment under real-time financial workloads," *Concurrency and Computation: Practice and Experience*, vol. 28, no. 3, pp. 916–928, 2016, (JCR IF 1.167). DOI: 10.1002/cpe.3704.
- PPL'15** G. **Georgakoudis**, C. Gillan, A. Sayed, I. Spence, R. Faloon, and D. S. Nikolopoulos, "Iso-Quality of Service: Fairly Ranking Servers for Real-Time Data Analytics," *Parallel Processing Letters*, vol. 25, no. 03, p. 1541004, 2015. DOI: 10.1142/S0129626415410042.

Workshops and Posters

- WACCPD'21** C. Liao, A. Wang, G. **Georgakoudis**, B. R. de Supinski, Y. Yan, D. Beckingsale, and T. Gamblin, "Extending OpenMP for Machine Learning-Driven Adaptation," in *Accelerator Programming Using Directives*, S. Bhalachandra, C. Daley, and V. Melesse Vergara, Eds., Cham: Springer International Publishing, 2022, pp. 49–69.
- CANOPIE-HPC'22** D. J. Milroy, C. Misale, G. **Georgakoudis**, T. Elengikal, A. Sarkar, M. Drocco, T. Patki, J.-S. Yeom, C. E. A. Gutierrez, D. H. Ahn, and Y. Park, "One Step Closer to Converged Computing: Achieving Scalability with Cloud-Native HPC," in *2022 IEEE/ACM 4th International Workshop on Containers and New Orchestration Paradigms for Isolated Environments in HPC (CANOPIE-HPC)*, 2022, pp. 57–70. DOI: 10.1109/CANOPIE-HPC56864.2022.00011.
- P3HPC'22** K. Parasyris, G. **Georgakoudis**, J. Doerfert, I. Laguna, and T. R. Scogland, "Piper: Pipelining OpenMP Offloading Execution Through Compiler Optimization For Performance," in *2022 IEEE/ACM International Workshop on Performance, Portability and Productivity in HPC (P3HPC)*, 2022, pp. 100–110. DOI: 10.1109/P3HPC56579.2022.00015.
- IWOMP'22** G. **Georgakoudis**, T. R. W. Scogland, C. Liao, and B. R. de Supinski, "Extending OpenMP to Support Automated Function Specialization Across Translation Units," in *OpenMP in a Modern World: From Multi-device Support to Meta Programming*, M. Klemm, B. R. de Supinski, J. Klinkenberg, and B. Neth, Eds., Cham: Springer International Publishing, 2022, pp. 159–173.
- IWOMP'21** J. Huber, W. Wei, G. **Georgakoudis**, J. Doerfert, and O. Hernandez, "A Case Study of LLVM-Based Analysis for Optimizing SIMD Code Generation," in *OpenMP: Enabling Massive Node-Level Parallelism*, S. McIntosh-Smith, B. R. de Supinski, and J. Klinkenberg, Eds., **Best paper award**, Cham: Springer International Publishing, 2021, pp. 142–155.
- ICPPW'21** T. Jayatilaka, H. Ueno, G. **Georgakoudis**, E. Park, and J. Doerfert, "Towards Compile-Time-Reducing Compiler Optimization Selection via Machine Learning," in *50th International Conference on Parallel Processing Workshop*. New York, NY, USA: Association for Computing Machinery, 2021.

- IWOMP 2020** G. Georgakoudis, J. Doerfert, I. Laguna, and T. R. W. Scogland, "FAROS: A Framework to Analyze OpenMP Compilation Through Benchmarking and Compiler Optimization Analysis," in *OpenMP: Portable Multi-Level Parallelism on Modern Systems*, K. Milfeld, B. R. de Supinski, L. Koesterke, and J. Klinkenberg, Eds., **Best paper award**, Cham: Springer International Publishing, 2020, pp. 3–17.
- IWOMP 2015** F. Alessi, P. Thoman, G. Georgakoudis, T. Fahringer, and D. S. Nikolopoulos, "Application-Level Energy Awareness for OpenMP," in *OpenMP: Heterogenous Execution and Data Movements: 11th International Workshop on OpenMP, IWOMP 2015, Aachen, Germany, October 1-2, 2015, Proceedings*, Cham: Springer International Publishing, 2015, pp. 219–232. DOI: 10.1007/978-3-319-24595-9_16.
- WHPCF'14 (SC14)** C. J. Gillan, D. S. Nikolopoulos, G. Georgakoudis, R. Faloon, G. Tzenakis, and I. Spence, "On the Viability of Microservers for Financial Analytics," in *High Performance Computational Finance (WHPCF), 2014 Seventh Workshop on*, 2014, pp. 29–36. DOI: 10.1109/WHPCF.2014.11.
- COSMIC'13** G. Georgakoudis, D. S. Nikolopoulos, and S. Lalis, "Fast Dynamic Binary Rewriting to Support Thread Migration in shared-ISA Asymmetric Multicores," in *Proceedings of the First International Workshop on Code Optimisation for Multi and Many Cores (CGO)*, ser. COSMIC'13, **Best paper award**, Shenzhen, China, **Best paper award**: ACM, 2013, pp. 1–10. DOI: 10.1145/2446920.2446924.
- HPDC'12 (Poster)** G. Georgakoudis, S. Lalis, and D. S. Nikolopoulos, "Summary: Dynamic Binary Rewriting and Migration for shared-ISA Asymmetric, Multicore Processors," in *Proceedings of the 21st International Symposium on High-Performance Parallel and Distributed Computing*, ser. HPDC'12, Delft, The Netherlands: ACM, 2012, pp. 127–128. DOI: 10.1145/2287076.2287096.
- SECON'09** J. Domaszewicz, A. Pruszkowski, P. Cieslak, T. Paczesny, M. Roj, S. Lalis, G. Georgakoudis, and M. Koutsoubelias, "Development tools for opportunistic pervasive computing," in *Sensor, Mesh and Ad Hoc Communications and Networks Workshops, 2009. SECON Workshops '09. 6th Annual IEEE Communications Society Conference on*, 2009, pp. 1–3. DOI: 10.1109/SAHCNW.2009.5172927.