

# Gerasimos Gerogiannis

gg24@illinois.edu

Office 4238, Thomas M. Siebel Center  
201 N. Goodwin Avenue, Urbana, IL, 61801, USA

## RESEARCH INTERESTS

---

- Computer architecture
- Architectures for machine learning, graph analytics and scientific workloads
- Modern aspects of domain-specific systems such as flexibility, scalability, scheduling and decision-making
- Integration of specialization in general-purpose systems

## EDUCATION

---

### University of Illinois at Urbana-Champaign (UIUC)

Urbana, IL, USA

*PhD - Electrical and Computer Engineering; expected graduation date 06/2026*

*Aug. 2021 - present*

- Advisor: Prof. Josep Torrellas
- Current GPA: 4.0/4.0

### University of Patras

Patras, Greece

*Diploma in Electrical and Computer Engineering (B.Eng. + M.Eng.)*

*Sep. 2016 - June 2021*

- GPA: 9.83/10.00 (first of my class)
- Thesis: '*Reinforcement Learning for Task Offloading in Next Generation Networks: Algorithms and Hardware Acceleration*'  
Thesis Supervisor: Prof. Alexios Birbas

## AWARDS AND HONORS

---

### Rambus Computer Engineering Fellowship

UIUC, ECE Department, USA, 2024

- For demonstrating outstanding research performance in the area of Computer Engineering.

### IEEE Micro Top Picks from Computer Architecture Conferences Top Pick

IEEE, USA, 2024

- Awarded to the 12 most significant papers in computer architecture published in the previous year based on novelty and potential for long-term impact. Top Pick awarded for my paper: '*Micro-Armed Bandit: Lightweight & Reusable Reinforcement Learning for Microarchitecture Decision-Making*'.

### IEEE Micro Top Picks from Computer Architecture Conferences Honorable Mention

IEEE, USA, 2024

- Awarded to the 12 most significant papers in computer architecture published in the previous year based on novelty and potential for long-term impact. Honorable Mention awarded for my paper: '*SPADE: A Flexible and Scalable Accelerator for SpMM and SDDMM*'.

### ASPLOS Conference Travel Grant

ACM, USA, 2024

### HPCA Conference Travel Grant

IEEE, USA, 2024

### MICRO Conference Travel Grant

IEEE/ACM, USA, 2023

### ISCA Conference Travel Grant

IEEE/ACM, USA, 2023

### Student Excellence Award

University of Patras, Greece, 2021

- For the highest GPA among all 2020-2021 graduates of the Electrical and Computer Engineering Department of the University of Patras.

### Excellence Award

State Scholarships Foundation (IKY), Greece, 2021

- For the highest GPA among all 2020-2021 graduates of the Electrical and Computer Engineering Department of the University of Patras.

### Skouras Foundation Award

Skouras Foundation, Greece, 2020

- For the highest GPA among all undergraduate students in the Electrical and Computer Engineering Department of the University of Patras.

### Freshman Excellence Award

University of Patras, Greece, 2016

- For the highest grade in the National University Entrance Exams (Panhellenic Exams) among the freshmen students in the Electrical and Computer Engineering Department of the University of Patras.

## Distinctions in national high-school student competitions

2013-2016

- Replacement member of the student team that represented Greece in the 47th International Physics Olympiad (Switzerland-Liechtenstein, 2016).
- 7th place in phase A and phase B of the National Student Physics Competition organized by the University of Athens (2016).
- 10th place in the National Student Physics Competition organized by the University of Athens in cooperation with Greek Physicists Union (2015).
- 12th place in the National Student Chemistry Competition organized by the Greek Chemists Union (2015).
- Thales Prize in the National Student Mathematics Competition organized by the Greek Mathematical Society (2014-2015).
- Thales Prize in the National Student Mathematics Competition organized by the Greek Mathematical Society (2013-2014).
- Member of the team that finished 9th in the Greek Qualifiers for the European Union Science Olympiad (EUSO) (2015).

## CONFERENCE PUBLICATIONS

---

- [C7] *'MeshFlow: Efficient 2D Tensor Parallelism for Distributed DNN Training'*  
 Hyounghwook Nam, **Gerasimos Gerogiannis**, and Josep Torrellas,  
 To appear In Proceedings of the International Symposium on Computer Architecture (ISCA), June 2025
- [C6] *'Distributed-Memory Parallel Algorithms for Sparse Matrix and Sparse Tall-and-Skinny Matrix Multiplication'*  
 Isuru Ranawaka, Md Taufique Hussain, Charles Block, **Gerasimos Gerogiannis**, Josep Torrellas, and Ariful Azad  
 In Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis (SC), November 2024
- [C5] *'Two-Face: Combining Collective and One-Sided Communication for Efficient Distributed SpMM'*  
 Charles Block\*, **Gerasimos Gerogiannis**\*, Charith Mendis, Ariful Azad, and Josep Torrellas  
 \*Co-first authors, order is alphabetical  
 In Proceedings of the International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS), April 2024
- [C4] *'HotTiles: Accelerating SpMM with Heterogeneous Accelerator Architectures'*  
**Gerasimos Gerogiannis**, Sriram Aananthakrishnan, Josep Torrellas, and Ibrahim Hur  
 In Proceedings of the International Symposium on High Performance Computer Architecture (HPCA), March 2024
- [C3] *'Micro-Armed Bandit: Lightweight & Reusable Reinforcement Learning for Microarchitecture Decision-Making'*  
**Gerasimos Gerogiannis** and Josep Torrellas  
 In Proceedings of the International Symposium on Microarchitecture (MICRO), October 2023  
**Selected as a Top Pick in IEEE Micro Top Picks from Computer Architecture Conferences**
- [C2] *'SPADE: A Flexible and Scalable Accelerator for SpMM and SDDMM'*  
**Gerasimos Gerogiannis**, Serif Yesil, Damitha Lenadora, Dingyuan Cao, Charith Mendis, and Josep Torrellas  
 In Proceedings of the International Symposium on Computer Architecture (ISCA), June 2023  
**Selected as a Honorable Mention in IEEE Micro Top Picks from Computer Architecture Conferences**
- [C1] *'Characterizing the Scalability of Graph Convolutional Networks on Intel® PIUMA'*  
 Matthew Adiletta, Jesmin Jahan Tithi, Emmanouil-Ioannis Farsarakis, **Gerasimos Gerogiannis**, Robert Adolf, Robert Benke, Sidharth Kashyap, Samuel Hsia, Kartik Lakhota, Fabrizio Petrini, Gu-Yeon Wei, and David Brooks  
 In Proceedings of the International Symposium on Performance Analysis of Systems and Software (ISPASS), April 2023

## JOURNAL PUBLICATIONS

---

- [J2] *'Practical Online Reinforcement Learning for Microprocessors with Micro-Armed Bandit'*  
**Gerasimos Gerogiannis** and Josep Torrellas  
 IEEE Micro Magazine, Top Picks in Computer Architecture Special Issue, July-August 2024

- [J1] '*Deep Reinforcement Learning Acceleration for Real-Time Edge Computing Mixed Integer Programming Problems*'  
**Gerasimos Gerogiannis**, Michael Birbas, Aimilios Leftheriotis, Eleftherios Mylonas, Nikolaos Tzanis, and Alexios Birbas  
IEEE Access, January 2022

## SUBMITTED FOR PUBLICATION

---

- [S2] '*NetSparse: In-Network Acceleration of Distributed Sparse Kernels*'  
**Gerasimos Gerogiannis**, Charles Block, Annus Zulfiqar, Muhammad Shahbaz and Josep Torrellas  
Submitted for Publication, 2024
- [S1] '*DECA: An LLM Decompression Accelerator Grounded on a 3D-Roofline Model*'  
**Gerasimos Gerogiannis**, Stijn Eyerman, Evangelos Georganas, Wim Heirman and Josep Torrellas  
Submitted for Publication, 2024

## PREPRINTS

---

- [R1] '*Input-sensitive dense-sparse primitive compositions for GNN acceleration*'  
Damitha Lenadora, Vimarsh Sathia, **Gerasimos Gerogiannis**, Serif Yesil, Josep Torrellas and Charith Mendis  
arXiv preprint arXiv:2306.15155, June 2023

## POSTERS

---

- [O3] '*HotTiles: Accelerating SpMM with Heterogeneous Accelerator Architectures*'  
International Symposium on High Performance Computer Architecture (HPCA) Poster Session, March 2024
- [O2] '*SPADE: A Flexible and Scalable Accelerator for SpMM and SDDMM*'  
• ACE Center for Evolvable Computing Spring Meeting, June 2023  
• ACE Center for Evolvable Computing Annual Meeting, October 2023
- [O1] '*Micro-Armed Bandit: Lightweight & Reusable Reinforcement Learning for Microarchitecture Decision-Making*'  
International Symposium on Microarchitecture (MICRO) Poster Session, October 2023

## US PATENT APPLICATIONS

---

- [P1] '*Methods and Apparatus for a Machine Learning Model Decompression Accelerator*'  
**Gerasimos Gerogiannis**, Stijn Eyerman, Wim Heirman and Evangelos Georganas  
US Patent App. 18/927,638 November 2024

## CONFERENCE TALKS

---

- [N5] '*Sparsity at Scale: Towards Efficient Distributed Sparse Accelerators*'  
SRC TECHCON 2024,  
Session 24: Digital Processing: Artificial Intelligence, September 10 2024
- [N4] '*Two-Face: Combining Collective and One-Sided Communication for Efficient Distributed SpMM*'  
International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS),  
Session 1B: Optimizing ML Communication, April 29 2024
- [N3] '*HotTiles: Accelerating SpMM with Heterogeneous Accelerator Architectures*'  
International Symposium on High Performance Computer Architecture (HPCA), Session 10A: Accelerator, March 6 2024
- [N2] '*Micro-Armed Bandit: Lightweight & Reusable Reinforcement Learning for Microarchitecture Decision-Making*'  
International Symposium on Microarchitecture (MICRO), Session 5B: Prefetching, October 31 2023
- [N1] '*SPADE: A Flexible and Scalable Accelerator for SpMM and SDDMM*'  
International Symposium on Computer Architecture (ISCA), Session 1B: CPU Microarchitecture, June 19 2023

## OTHER TALKS

---

- [T5] '*Micro-Armed Bandit: Lightweight & Reusable Reinforcement Learning for Microarchitecture Decision-Making*'  
Intel uArch Monthly Meeting, July 16 2024
- [T4] '*Micro-Armed Bandit: Lightweight & Reusable Reinforcement Learning for Microarchitecture Decision-Making*'  
Intel Archfest, May 17 2024
- [T3] '*Micro-Armed Bandit: Lightweight & Reusable Reinforcement Learning for Microarchitecture Decision-Making*'  
ACE Center for Evolvable Computing Theme Meeting, December 1 2023
- [T2] '*Domain-Specific Hardware and Software for Mixed Sparse-Dense Algebra at Scale*'  
ACE Center for Evolvable Computing Theme Meeting, August 4 2023
- [T1] '*Accelerators for Irregular Applications*'  
IBM-Illinois Discovery Accelerator Institute Annual Meeting, March 1 2023

## SELECTED PROJECTS

---

- miniSPADE** 2022-2023
- Designed the microarchitecture and taped-out a simplified ASIC prototype of the accelerator described in our ISCA'23 paper using TSMC 65nm technology.

## WORK EXPERIENCE

---

- Graduate Intern** January 2024 - December 2025 (ongoing)  
*Intel Corporation* (remote) Champaign, IL, USA
- CPU architecture redesign for emerging Machine Learning applications such as Large Language Models.
- Graduate Intern** May 2023 - August 2023  
*Intel Corporation* (remote) Champaign, IL, USA
- Heterogeneous accelerator architectures to accelerate sparse matrix - dense matrix multiplication.
  - Research conducted in internship led to publication in HPCA'24.
- Graduate Intern** May 2022 - August 2022  
*Intel Corporation* (remote) Champaign, IL, USA
- Synergies between hardware and software to maximize performance on the Intel Programmable Integrated Unified Memory Architecture (PIUMA).
  - Research conducted in internship led to publication in ISPASS'23.
- Research Assistant** August 2021 - present  
*i-acom group, University of Illinois at Urbana-Champaign* Champaign, IL, USA

## TEACHING EXPERIENCE

---

- Private Tutor** 2016 – 2020  
*Patras, Greece*
- Tutor** 2020 – 2021  
*Proximo Education Center* Patras, Greece
- Gave lectures and tutored undergraduate students in preparation for their exams in a variety of electrical and computer engineering subjects.

## GRANT WRITING EXPERIENCE

---

- NSF** 2023 – 2028  
*PPoSS: LARGE: General-Purpose Scalable Technologies for Fundamental Graph Problems* Amount: \$5,000,000
- Lead PI: Josep Torrellas, number of PIs: 10
  - Assisted in the preparation and writing of the NSF Grant proposal, focusing on hardware support for scalable graph algorithms and on the hardware-software interaction.

## PROFESSIONAL MEMBERSHIPS

---

- Student Member** May 2023 – present  
*ACM*

## TECHNICAL SKILLS

---

**Programming Languages:** C/C++, Python, Matlab, Shell/Bash scripting, Perl, VHDL, Verilog

**Parallel Programming:** OpenMP, MPI, Posix Threads

**Frameworks/Libraries:** Simulink, Vivado, Vivado HLS, Cadence EDA tools, TensorFlow, PyTorch, Deep Graph Library

**Microarchitectural Simulators and Tools:** SST, Sniper, gem5, ChampSim, Accel-Sim, DRAMSim, CACTI, McPAT

**Development Tools:** git, CMake

## HOBBIES

---

- FIDE rated chess player - member of the team that won the bronze medal in the National Student Chess Competition (2013).
- Guitar and Greek traditional instruments player.

## REFERENCES AVAILABLE UPON REQUEST

---

**Josep Torrellas**, Professor, University of Illinois at Urbana-Champaign, USA

**Charith Mendis**, Assistant Professor, University of Illinois at Urbana-Champaign, USA

**Ibrahim Hur**, Senior Principal Architecture Lead, Microsoft, USA

**Stijn Eyerman**, Research Scientist, Intel, Belgium

**Alexios Birbas**, Professor, University of Patras, Greece

**Stavros Koubias**, Professor Emeritus and Former Rector, University of Patras, Greece