Georgios Vavouliotis

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Research Interests

Computer Architecture, High Performance Computing, Machine Learning for Computer Architecture, Data Centers; identifying and exploiting the predictability of programs to design μarchitectural prefetching and prediction mechanisms for the cache and the TLB hierarchy, improving cache/TLB management for emerging applications with large data and code footprints, leveraging machine learning algorithms to design intelligent μarchitectural components, and re-thinking μarchitectural designs for server and data center applications.

Education

Universitat Politècnica de Catalunya (UPC) — **Barcelona**
Doctor of Philosophy (Ph.D.), Advisors: Dr. Marc Casas, Dr. Lluc Alvarez — *Sept 2018-Dec 2022*
Advanced Hardware Prefetching in Virtual Memory Systems

National Technical University of Athens (NTUA) — **Athens**
Diploma (M.Eng.) on Electrical & Computer Engineering (M.Sc. equivalent), **GPA: 8.9/10** — *2012-March 2018*

Academic Directions
- *Computer Systems & Software*
- *Computer Networks and Networks Security*
- *Signal Processing, Automatic Control and Robotics*

Employment

Huawei Zurich Research Center — **Zurich**
Postdoctoral Researcher — *Feb 2023–now*

Huawei Zurich Research Center — **Zurich**
Research Internship — *Nov 2021–April 2022*
Hardware Accelerated Java Garbage Collection

Barcelona Supercomputing Center (BSC-CNS) — **Barcelona**
Researcher at Computer Architecture & Operating Systems Group — *Sept 2018–Dec 2022*

National Technical University of Athens (NTUA) — **Athens**
Research Student at Computer Systems Laboratory (CSLab) — *Feb 2018–July 2018*

Honors and Awards

HiPEAC 2022 Paper Award — **Chicago**
For the Page Size Aware Cache Prefetching paper — *2022*

Travel Grant for MICRO'22 — **Chicago**
MICRO 2022 Conference — *2022*

Travel Grant for ISCA'22 — **New York**
ISCA 2022 Conference — *2022*

HiPEAC 2021 Paper Award — **Virtual**
For the Morrigan: A Composite Instruction TLB Prefetcher paper — *2021*

HiPEAC 2021 Paper Award — **Virtual**
For the Exploiting Page Table Locality for Agile TLB Prefetching paper — *2021*

Best Poster Award — **Virtual**
2021 ACM School on HPC Computer Architectures for AI and Dedicated Applications — *2021*

2019 FPI Doctoral Fellowship — **Barcelona**
Funded by Spanish Government (MINECO) — *2019-2022*

Travel Grant for ASPLOS'20 — **Lausanne/Virtual**
ASPLOS 2020 Conference — *2020*

○ **Mathematics Award - National Technical University of Athens (NTUA)** **Athens**
Excellent marks in all mathematical courses during the first two (2) years. *2014*

○ **"The Great Moment of Education" Eurobank EFG Scholarship** **Chalkida**
Highest rank in National Qualifications Exams in my school *2012*

Peer-Reviewed Conference Publications

[1] **Georgios Vavouliotis**, Gino Chancon, Lluc Alvarez, Paul V. Gratz, Daniel A. Jiménez, Marc Casas, Page Size Aware Cache Prefetching. Proceedings of the 55th IEEE/ACM International Symposium on Microarchitecture (MICRO), Chicago, Oct 2022.

[2] **Georgios Vavouliotis**, Lluc Alvarez, Boris Grot, Daniel A. Jiménez, Marc Casas, *Morrigan: A Composite Instruction TLB Prefetcher*. Proceedings of the 54th IEEE/ACM International Symposium on Microarchitecture (MICRO), Virtual, Oct 2021.

[3] **Georgios Vavouliotis**, Lluc Alvarez, Vasileios Karakostas, Konstantinos Nikas, Nectarios Koziris, Daniel A. Jiménez, Marc Casas, *Exploiting Page Table Locality for Agile TLB Prefetching*. Proceedings of the 48th International Symposium on Computer Architecture (ISCA), Virtual, June 2021. Also presented as a *Poster* at the 49th International Symposium on Computer Architecture (ISCA), New York, June 2022.

Peer-Reviewed Journal/Workshop Publications and Posters

[1] **Georgios Vavouliotis**, Gino Chancon, Lluc Alvarez, Paul V. Gratz, Daniel A. Jiménez, Marc Casas, *Leveraging Page Size Information to Enhance Data Cache Prefetching*. Poster at the 2021 ACM Summer School on HPC Computer Architectures for AI and Dedicated Applications, Virtual, Aug 2021. [Best Poster Award]

[2] **Georgios Vavouliotis**, Lluc Alvarez, Marc Casas, *Pushing the envelope on free TLB prefetching*. Proceedings of the 8th BSC Doctoral Symposium, Virtual, May 2021.

[3] **Georgios Vavouliotis**, *Cost-Effective Instruction TLB Prefetching*. Second Young Architect Workshop (YArch 2020). In conjunction with The 25th ACM International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS), Virtual, March 2020.

[4] **Georgios Vavouliotis**, Goumas Georgios, *"Performance Analysis of TLB Prefetching Mechanisms"*. Book of my diploma thesis.

Invited Talks

○ **Advanced Hardware Prefetching in Virtual Memory Systems** **Athens**
6th Computing Systems Research Day @ CSLab *Jan 2023*

○ **Page Size Aware Cache Prefetching** **Chicago**
55th IEEE/ACM International Symposium on Microarchitecture (MICRO) *Oct 2022*

○ **Morrigan: A Composite Instruction TLB Prefetcher** **Zurich**
Huawei Zurich Research Center *Dec 2021*

○ **Morrigan: A Composite Instruction TLB Prefetcher** **Virtual**
54th IEEE/ACM International Symposium on Microarchitecture (MICRO) *Oct 2021*

○ **Leveraging Page Size Information to Enhance Data Cache Prefetching** **Virtual**
ACM School on HPC Computer Architectures for AI and Dedicated Applications *Aug 2021*

○ **Exploiting Page Table Locality for Agile TLB Prefetching** **Virtual**
48th International Symposium on Computer Architecture (ISCA) *June 2021*

○ **Pushing the Envelope on Free TLB Prefetching** **Virtual**
8th BSC Doctoral Symposium *May 2021*

Technical Reviewer for Conferences

○ **ACM Transactions on Architecture and Code Optimization (TACO'23)**
Reviewer

- **IEEE Supercomputing Conference (SC'21)**
  Sub-reviewer
- **IEEE Transactions on Computers (2021)**
  Reviewer
- **ACM International Conference on Computing Frontiers (CF'21)**
  Sub-reviewer

Teaching Experience

- **Private Tutor** **Athens**
  C programming, Computer Architecture, Automatic Control for undergraduate students *2013–2018*
- **Lab Assistant at National Technical University of Athens (NTUA)** **Athens**
  C programming *2013-2017*

Selected Press

- **TCuArch Interview** **youtube**
  What attracted you to research computer architecture and systems? *Dec 2022*
- **Page Size Aware Cache Prefetching** **easyperf.net**
  Oct Newsletter of easyperf.net – *Among the Most Interesting MICRO '22 Papers* *Oct 2022*

Languages

- Greek (Native)
- English
- Italian (Beginner)
- Spanish (Beginner)