

# Georgios Vavouliotis

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## Research Interests

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**Computer Architecture, High Performance Computing, Machine Learning for Computer Architecture, Data Centers;** identifying and exploiting the predictability of programs to design  $\mu$ architectural 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  $\mu$ architectural components, and re-thinking  $\mu$ architectural designs for server and data center applications.

## Education

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- **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** (Cum Laude Award)
- **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

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- **Huawei Zurich Research Center** **Zurich**  
*Postdoctoral Researcher* *Feb 2023–now*
- **Huawei Zurich Research Center** **Zurich**  
*Research Internship* *Nov 2021–April 2022*  
*Impact of Concurrent Java Garbage Collectors on Cache Locality*
- **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

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- **Cum Laude Ph.D. Award** **Spain**  
*For my Ph.D. dissertation entitled Advanced Hardware Prefetching in Virtual Memory Systems* *2023*
- **Hisilicon Core Star Award (awarded by Huawei)** **Shenzhen**  
*For the [Concurrent GCs and Modern Java Workloads: A Cache Perspective](#) paper* *2023*
- **Best Paper Award - ISMM 2023** **Orlando**  
*For the [Concurrent GCs and Modern Java Workloads: A Cache Perspective](#) paper* *2023*
- **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

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- [1] Alexandre Valentin Jamet, **Georgios Vavouliotis**, Lluc Alvarez, Daniel A. Jiménez, Marc Casas, [A Two Level Neural Approach Combining Off-Chip Prediction with Adaptive Prefetch Filtering \(to appear\)](#). Proceedings of the 30th International Symposium on High-Performance Computer Architecture (HPCA), Edinburgh, March 2024.
- [2] Maria Carpen-Amarié, **Georgios Vavouliotis**, Konstantinos Tovletoglou, Boris Grot, Rene Mueller, [Concurrent GCs and Modern Java Workloads: A Cache Perspective](#). Proceedings of the 2023 ACM SIGPLAN International Symposium on Memory Management (ISMM), Orlando, June 2023. [**Best Paper Award**]
- [3] **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.
- [4] **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.
- [5] **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

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- [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.

## Dissertations

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- [1] **Georgios Vavouliotis** *"Advanced Hardware Prefetching in Virtual Memory Systems"*. Book of my Doctoral dissertation.  
  
**Thesis Statement:** *Hardware TLB prefetching can reduce the address translation overheads posed with applications with large data and code footprints while exploiting address translation metadata available at the microarchitecture and runtime levels can improve the performance of cache prefetchers.*
- [2] **Georgios Vavouliotis**, Goumas Georgios, *"Performance Analysis of TLB Prefetching Mechanisms"*. Book of my Diploma thesis (in Greek).

## Invited Talks

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- **Advanced Hardware Prefetching in Virtual Memory Systems** **Athens**  
[6th Computing Systems Research Day @ CSLab](#) Jan 2023

- **Page Size Aware Cache Prefetching** **Chicago**  
Oct 2022  
55th IEEE/ACM International Symposium on Microarchitecture (MICRO)
- **Morrigan: A Composite Instruction TLB Prefetcher** **Zurich**  
Dec 2021  
Huawei Zurich Research Center
- **Morrigan: A Composite Instruction TLB Prefetcher** **Virtual**  
Oct 2021  
54th IEEE/ACM International Symposium on Microarchitecture (MICRO)
- **Leveraging Page Size Information to Enhance Data Cache Prefetching** **Virtual**  
Aug 2021  
ACM School on HPC Computer Architectures for AI and Dedicated Applications
- **Exploiting Page Table Locality for Agile TLB Prefetching** **Virtual**  
June 2021  
48th International Symposium on Computer Architecture (ISCA)
- **Pushing the Envelope on Free TLB Prefetching** **Virtual**  
May 2021  
8th BSC Doctoral Symposium

## Professional Activities - Leadership & Service

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- **European Conference on Parallel and Distributed Computing (Euro-Par'24)** **Madrid**  
2023-2024  
*Program Committee (PC) member*
- **International Symposium on High-Performance Computer Architecture (HPCA'24)** **Edinburgh**  
2023-2024  
*Artifact Evaluation Committee member*
- **International Symposium on Computer Architecture (ISCA'24)** **Buenos Aires**  
2023-2024  
*Website Co-Chair*

## Technical Reviewer for Conferences and Journals

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- European Conference on Parallel and Distributed Computing (Euro-Par'24)
- International Symposium on High-Performance Computer Architecture (HPCA'24)-Artifact Evaluation
- Journal of Parallel and Distributed Computing (JPDC'23)
- IEEE Access 2023
- ACM Transactions on Architecture and Code Optimization (TACO'23)
- IEEE Supercomputing Conference (SC'21)
- IEEE Transactions on Computers (2021)
- ACM International Conference on Computing Frontiers (CF'21)

## Teaching Experience

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

## Selected Press

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

## Languages

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