# Georgios Vavouliotis | Curriculum Vitae

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## Profile

I earned my diploma on Electrical and Computer Engineering from the National Technical University of Athens (NTUA). Currently, I am a 4th year Ph.D. student in Computer Science at Universitat Politècnica de Catalunya (UPC) and Barcelona Supercomputing Center (BSC-CNS). My supervisors are Dr. Marc Casas Guix from BSC-CNS and Dr. Lluc Alvarez from UPC. Moreover, I collaborate with Prof. Daniel A. Jiménez from Texas A&M University and Prof. Boris Grot from the University of Edinburgh. My research mainly aims at designing intelligent microarchitectural prediction/prefetching mechanisms for the cache and the TLB hierarchy.

## Areas of (Research) Interest

**Computer Architecture, High Performance Computing (HPC) Systems, Machine Learning for Computer Architecture;** identifying and exploiting the predictability of programs to design microarchitectural prefetching/prediction mechanisms for the cache and the TLB hierarchy, improving the cache/TLB management, and leveraging machine learning algorithms to design intelligent microarchitectural components.

## Education

**Universitat Politècnica de Catalunya (UPC)** — **Barcelona**
*Doctor of Philosophy (Ph.D.)* — *September 2018-now*
***Leveraging Artificial Intelligence Algorithms for Hardware Prediction***

**National Technical University of Athens (NTUA)** — **Athens**
*Diploma on Electrical & Computer Engineering, **300 ECTS**, **GPA: 8.9/10*** — *2012-March 2018*

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

Diploma Thesis...............................................................................................................
*Performance Analysis of TLB Prefetching Mechanisms, **GPA: 10/10***

**General Lyceum, Chalkida, Greece** — **Chalkida**
*Apolytirion, **Top 0.2%** in National Qualification Exams, **GPA: 19.5/20*** — *2009-2012*

## Research Experience

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

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

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

## Participation in Projects

**SOW 5.3 - Intel and BSC-CNS Collaboration** — **Barcelona**
*Barcelona Supercomputing Center (BSC-CNS)* — *September 2018–now*

**High Performance Computing VII** — **Barcelona**
*Barcelona Supercomputing Center (BSC-CNS)* — *September 2018–now*

## Publications

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

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

[3] **Georgios Vavouliotis**, Gino Chancon, Lluc Alvarez, Paul V. Gratz, Daniel A. Jiménez, Marc Casas Guix, *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, August 2021. [Best Poster Award]

[4] **Georgios Vavouliotis**, Lluc Alvarez, Vasileios Karakostas, Konstantinos Nikas, Nectarios Koziris, Daniel A. Jiménez, Marc Casas Guix, *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.

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

[6] **Georgios Vavouliotis**, Lluc Alvarez, Daniel A. Jiménez, Marc Casas Guix, *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.

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

## Invited Talks

**Morrigan: A Composite Instruction TLB Prefetcher** — **Zurich**
*Huawei Zurich Research Center* — *December 2021*

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

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

**IEEE Supercomputing Conference (SC'21)**
*Sub-reviewer*

**IEEE Transactions on Computers (2021)**
*Reviewer*

**18th ACM International Conference on Computing Frontiers (CF'21)**
*Sub-reviewer*

## Teaching Experience

**Private Tutor** — **Athens**
*During my Diploma I was giving private lectures to:* — *2013–2018*

- **Undergraduate students of Computer Science Department**
  *C programming, Computer Architecture, Operating Systems, Automatic Control*

- **High school students**
  *Mathematics, Physics*

| **Lab Assistant at National Technical University of Athens (NTUA)** | **Athens** |
|---|---|
| *C programming* | *2013-2017* |

## Seminars and Training Courses

○ **Summer Schools**
*Participation in accredited Summer Schools (**certification provided**)*

- **HPC Architectures for Artificial Intelligence and Dedicated Applications**
  *Provided by **ACM-Europe**, 17 - 24 July 2019 & 30 - 3 August 2021*

○ **Seminars**
*Participation in accredited seminars (**certification provided**)*

- **Introduction to Big Data & Practical Data Analytics for Solving Real World Problems**
  *Provided by **PACT BSC-CNS**, February 2021*

- **Introduction to Heterogenous Memory Usage**
  *Provided by **PACT BSC-CNS**, February 2019*

○ **Online Courses (MOOCs)**
*Courses offered by accredited universities and training programs (**certification provided**)*

- **Machine Learning**
  *Provided by **Stanford University** (Prof. Andrew Ng), May 2018 - July 2018, **GPA: 10/10***

- **Advanced Programming with Python**
  *Provided by **Mathesis Online Platform**, March 2018 - April 2018, **GPA: 10/10***

## Technical and Personal Skills

○ **Programming Languages**
- Advanced knowledge: C
- Working knowledge: C++, Python, Matlab, Assembly (8085, 8086, AVR), SML/NJ, HTML

○ **Tools**
- Advanced knowledge: Unix Bash, LaTeX, SVN
- Working knowledge: Git, CACTI, MS Office

○ **Simulators**
- Advanced knowledge: ChampSim

○ **General Business Skills**
- Ability to work with a team
- Very good presentation skills
- Able to write well organized and structured reports

## Honors and Awards

| **Travel Grant for ISCA'22** | **New York** |
|---|---|
| *ISCA 2022 Conference* | *2022* |
| **HiPEAC 2021 Paper Award** | **Virtual** |
| *For the MICRO'21 paper* | *2021* |
| **HiPEAC 2021 Paper Award** | **Virtual** |
| *For the ISCA'21 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*

## Languages

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

## References

- **Daniel A. Jiménez**    djimenez.@.cse.tamu.edu
  *Texas A&M University*
- **Boris Grot**    boris.grot@ed.ac.uk
  *University of Edinburgh*
- **Marc Casas**    marc.casas@bsc.es
  *Universitat Politècnica de Catalunya, Barcelona Supercomputing Center*
- **Lluc Alvarez**    lluc.alvarez@bsc.es
  *Universitat Politècnica de Catalunya, Barcelona Supercomputing Center*