

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. Lluç 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 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*
Accelerating Java Garbage Collection Through Microarchitecture
- **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**, 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.
- [2] **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]
- [3] **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.
- [3] **Georgios Vavouliotis**, Lluc Alvarez, Marc Casas Guix, *Pushing the envelope on free TLB prefetching*. Proceedings of the 8th BSC Doctoral Symposium, Virtual, May 2021.
- [4] **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.
- [5] **Georgios Vavouliotis**, Goumas Georgios, *"Performance Analysis of TLB Prefetching Mechanisms"*. Book of my diploma thesis.

Invited Talks

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| ○ Morrigan: A Composite Instruction TLB Prefetcher
<i>Huawei Zurich Research Center</i> | Zurich
<i>December 2021</i> |
| ○ Morrigan: A Composite Instruction TLB Prefetcher
<i>54th IEEE/ACM International Symposium on Microarchitecture (MICRO)</i> | Virtual
<i>October 2021</i> |
| ○ Leveraging Page Size Information to Enhance Data Cache Prefetching
<i>ACM School on HPC Computer Architectures for AI and Dedicated Applications</i> | Virtual
<i>August 2021</i> |
| ○ Exploiting Page Table Locality for Agile TLB Prefetching
<i>48th International Symposium on Computer Architecture (ISCA)</i> | Virtual
<i>June 2021</i> |
| ○ Pushing the Envelope on Free TLB Prefetching
<i>8th BSC Doctoral Symposium</i> | Virtual
<i>May 2021</i> |

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

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| ○ Private Tutor
<i>During my Diploma I was giving private lectures to:</i> <ul style="list-style-type: none">- Undergraduate students of Computer Science Department
<i>C programming, Computer Architecture, Operating Systems, Automatic Control</i>- High school students
<i>Mathematics, Physics</i> | Athens
<i>2013–2018</i> |
| ○ Lab Assistant at National Technical University of Athens (NTUA)
<i>C programming</i> | Athens
<i>2013-2017</i> |

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

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| ○ 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

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

References

<ul style="list-style-type: none">o Daniel A. Jiménez <i>Texas A&M University</i>	djimenez.@cse.tamu.edu
<ul style="list-style-type: none">o Boris Grot <i>University of Edinburgh</i>	boris.grot@ed.ac.uk
<ul style="list-style-type: none">o Marc Casas <i>Universitat Politècnica de Catalunya, Barcelona Supercomputing Center</i>	marc.casas@bsc.es
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