

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 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, ***Title is not shown for transparency***. Paper is under submission at the 55th IEEE/ACM International Symposium on Microarchitecture (MICRO), 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)**
C programming

Athens
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**
Highest rank in National Qualifications Exams in my school

Chalkida
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**
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