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 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

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

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

○ **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*

Affiliations

○ ACM student member   ○ Affiliated PhD student in HiPEAC

Languages

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

Personal Interests and extra-curricular activity

○ Challenges   ○ Cooking   ○ Basketball   ○ Travelling   ○ Writing   ○ Cinema

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

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References