

Athanasios Kastoras

[akastoras](#) | [Thanos Kastoras](#) | [Website](#) | athanasios.kastoras@bsc.es

RESEARCH INTERESTS

Compilers, Computer Architecture, HPC and Embedded Systems, Accelerators.

EDUCATION

- 2019 - Present | Diploma (5 years) in ELECTRICAL AND COMPUTER ENGINEERING
University of Thessaly, Volos, Greece
CURRENT GPA (FOR 45 TOTAL COURSES): **8.64/10**
CURRENT MAJOR GPA (FOR 19 ELECTIVE COURSES): **9.64/10**
- 20-26 Jul 2025 | ACM EUROPE SUMMER SCHOOL ON HPC COMPUTER ARCHITECTURES FOR AI AND DEDICATED APPLICATIONS
Barcelona Supercomputing Center (BSC-CNS), Barcelona, Spain
Topics covered: HPC for AI, RISC-V, quantum computing, Parallel Systems

WORK EXPERIENCE

- March 2025-Present* | Junior Research Engineer at [Barcelona Supercomputing Center](#), Barcelona, Spain
Member of the "Compilers and Toolchains for HPC" group in the Computer Sciences Department. Extending the compiler of the vector RISC-V architecture to exploit AoS-to-SoA memory accesses of the RISC-V Vector Extension.
- Apr 2024-Sept 2024* | Undergraduate Student Researcher at [CSL](#), University of Thessaly, Greece
Roofline Analysis of High-Level Synthesis designs for Reconfigurable Platforms using the LLVM Compiler Infrastructure.
- Oct 2023-March 2024* | CPU Performance and Modeling Intern at [Arm](#), Sophia-Antipolis, France
Modelling and performance characterization of Dead Block Predictor based cache replacement policies. Extended a cycle-accurate model of an ARM processor written in C, with a generic implementation of a prediction table designed to support several dead block predictor policies.
- Oct 2022-Jan 2025* | Undergraduate Teaching Assistant at [E-CE, University of Thessaly](#), Greece
Computer Organization and Design, Fall 2022, Prof. Nikolaos Bellas. Examination of laboratory assignments on MIPs assembly programming, Verilog implementation of a MIPs CPU, and performance analysis and optimization of a large program on x86 CPUs.
Embedded Systems, Spring 2024, Prof. Nikolaos Bellas. Enabling students to implement a dynamic programming algorithm in High-Level Synthesis C and execute it on Zedboard FPGAs.
- Jun 2022-Sep 2022* | Research Intern at [CSL](#), University of Thessaly, Greece
Optimized the Raycast Hardware kernel on the FPGA. Raycast is used in real-time KinectFusion, a complex, Simultaneous Localization and Mapping (SLAM) algorithm for Robotics. Focused on getting over the memory access patterns limitations.
- Jul 2021-Aug 2021* | Research Intern at [Barcelona Supercomputing Center](#), Remote
Internship under the scope of PRACE Summer of HPC program. Worked on FTI, a fault tolerance library for distributed computing applications. Integrated lossy compression in the checkpoint/restart mechanism to reduce IO bottleneck on checkpoint/restart mechanism.

PUBLICATIONS

- Athanasios Kastoras, Kevser Ildes, Kai Keller, Leonardo Bautista-Gomez
Accelerating checkpoint/restart with lossy methods (Poster at Student Research Symposium),
2021 IEEE 28th International Conference on High-Performance Computing, Data, and Analytics (HiPC'21), Bangalore, India.
- Kevser Ildes, Athanasios Kastoras, Kai Keller, Leonardo Bautista-Gomez
Accelerating checkpoint/restart with lossy methods (Extended Abstract),
2021 IEEE/ACM 11th Workshop on Fault Tolerance for HPC at eXtreme Scale (FTXS'21), St. Louis, USA

SELECTED ACADEMIC PROJECTS

ECE 415: High-Performance Computing

- Parallel implementation of a Sobel Filter with OpenMP
- GPU acceleration of a separable convolution kernel with CUDA
- CPU/GPU acceleration of a histogram equalization algorithm with OpenMP/CUDA
- CPU/GPU acceleration of an N-body simulation with OpenMP/CUDA

ECE 340: Embedded Systems

- Hardware acceleration of the Smith-Waterman Local Sequence Alignment algorithm for Genomics using the Vitis High-Level Synthesis toolset, on a low-power FPGA MPSoC
- Performance measurement of bare-metal embedded software on an ARM processor
- IEEE 754 compatible Floating-Point Adder in Verilog on an FPGA

ECE 340: Concurrent Programming

- Implementation of a User-Level threads runtime based on Pthreads, and a trie-based tuple space for synchronization
- Implementation of many concurrent algorithms in C/Java using Semaphores/Monitors

ECE 318: Operating Systems

- Benchmarking alternatives of Shortest-Job First (SJF) on a VM that emulates the API of the Linux scheduler
- Implementation of a user-space file system based on FUSE with support for basic file operations
- Modifying the SLOB memory allocator to use the First-fit algorithm for both page and block allocation

ECE 319: Compilers

- Implementation of the front-end of a compiler for a language based on a subset of FORTRAN, using Flex and Bison for the lexical and syntax analysis, and C for semantic analysis and AST generation.

ECE 338 Parallel Computer Architecture

- Series of theoretical exercises from the Hennessy & Patterson book.
- Design of a pipelined in-order RISC-V CPU supporting the RV32I ISA instructions in Verilog, with Unit Test based Verification.

ECE494: Processor Design

- Hardware acceleration of Quantized Deep Neural Networks on FPGAs using the FINN compiler by Xilinx. Evaluation of several levels of quantization and the effects on accuracy, performance, and power consumption

ECE 480: Deep Learning and its Applications

- Evaluation of the Neural Collaborative Filtering (NeuMF) architecture for Recommendation Systems on a subset of the MovieLens Data-set in PyTorch

ECE 333: Digital Circuits Lab

Verilog Implementation and evaluation on Nexys A7 FPGA of:

- A 7-Segment Display Driver to display a scrolling message
- A UART serial communication system
- A VGA driver used to drive a conventional monitor and depict a variety of images

SKILLS

SOFTWARE	C, C++, Python, CUDA
HARDWARE	Verilog, HLS C/C++, Xilinx Tools
FRAMEWORKS	LLVM, OpenMP, Flex/Bison, MPI, Pthreads, Pytorch, Eigen
TOOLS	git, CMake, Makefile, Intel VTune, Xilinx Vitis HLS & Vivado

VOLUNTARY WORK/EXTRA CURRICULARS

-
- Elected Member of the Student Council of the E-CE department at the University of Thessaly (May 2024-April 2025)
 - Head of Academics Committee at [14th Electrical and Computer Engineering Student Conference](#) (April 7-9 2023)
 - Active Member of IEEE Student Branch Volos (2020-2022)
 - Organizing Activities: UTh Cinema Club, UTh Hikers Group

LANGUAGES

GREEK:	Native Speaker
ENGLISH:	Intermediate (CEFR - B2)
SPANISH:	Beginner