Dimitris Aspetakis

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(he/him)

Profile

Dimitris Aspetakis is a recently-graduated MSc student from the Computer Science Department of the University of Crete. He currently works at ICS FORTH, researching software-based memory isolation techniques targeting GP-GPU multitenancy. His academic interests span across **Programming Languages**, **Compilers**, **Hardware Architecture**, **Parallel & Distributed Systems** and **Formal Methods**.

- Most experienced with **C**, **Ocaml**, **C++** and **Typst**.
- Moderately proficient in **Rust**, **Cuda**, **SystemVerilog**, **Ada** and **Latex**.
- Hands-on experience with frameworks/projects: **LLVM**, **Cranelift** and **CIL**.

During his free time, he enjoys playing **basketball** and **table-tennis**. Whenever possible, he equally appreciates **cycling**, **fishing**, **playing piano**, the occasional **video game**, and **going for a swim**.

Education

Master in Computer Science
September 2023 – July 2025

University of Crete
Heraklion, Greece

Master's Thesis

«GPU AToLL: Optimizing Software-Based Memory Isolation on GP-GPUs»

Graduated with 9.57 / 10.

Bachelor in Computer Science
September 2019 – July 2023

University of Crete
Heraklion, Greece

Bachelor's Thesis

«Evaluation of the Ada-SPARK Language Effectiveness in Graphics Processing Units for Safety Critical Systems»

Graduated with the 3rd highest grade in class — 9.32 / 10.

Teaching Assistance Experience

University	Course	Period
University of Crete	Information System Analysis and Design	Spring 2022
University of Crete	Computer Organization (intermediate H/W architecture course)	Spring {2023, 2024, 2025}
University of Crete	Data Structures	Fall {2023, 2024}
University of Crete	Digital Design (introductory H/W design course)	Fall 2024

Work

CARV laboratory, ICS-FORTH
August 2025 – Present

Short-term researching contract
Heraklion, Greece

His main research has been focused around fine-grain GP-GPU memory isolation techniques, targeting a FaaS-like future for cloud accelerators.

Barcelona Supercomputing Center August 2023 – March 2024
Research Engineer Barcelona, Spain

Dimitris' Bachelor's project was conducted during his Erasmus visit at the Polytechnic University of Catalonia, attracting interest from the **European Space Agency** and resulting in his contracted hiring for 8 months at the **Barcelona Supercomputing Center**. He was tasked with driving the work behind ESA's "**Formal Methods for GPU Software Development and Verification**" activity (ESA STAR AO 2-1856/22/NL/GLC/ov).

Publications

- **Formal Methods for High Integrity GPU Software Development and Verification**
  Dimitris Aspetakis, Leonidas Kosmidis, Matina Maria Trompouki, Jose Ruiz, Gabor Marosy.
  Design, Automation & Test in Europe Conference & Exhibition (**DATE**), March 2024.

Notable Projects

- **GPU-AToLL: software-based memory isolation for GP-GPU multitenancy** [under development]
  The project provides a memory isolation solution targeting lightweight context switching with minimal runtime overheads on NVIDIA GPUs. It utilizes a mix of static analysis (with custom LLVM passes) and dynamic instrumentation of kernels, along with interception on the CUDA driver and runtime APIs.
- **Mid-Level Instruction Scheduling on Cranelift**
  A two-person project for CS-446 (Managed Runtime Systems) at the University of Crete. This work on wasmtime aims to improve the performance of WebAssembly by implementing mid-level instruction scheduling on Cranelift using various heuristic techniques. The main idea from issue #6260 has been fully-implemented, but the work has remained unmerged due to a lack of statistically significant performance gains on some benchmarks, and non-trivial (10-30%) compilation-time regressions.
- **Cuda2AdaSpark** [prototype status]
  Starting from kernels in a CUDA subset, this transpiler (aided by pragma-enabled semantics) is able to generate equivalent ADA programs targeting NVIDIA GPUs, enhanced with formal verification from ADA-SPARK. It was constructed for the "**Formal Methods for GPU Software Development and Verification**" ESA activity at BSC.
- **Alpha compiler & virtual machine**
  From-scratch compiler and VM written in C (with Bison as the only external dependency) targeting a custom dynamic language (Alpha). It was a three-person group project for CS-340 (Compilers) at the University of Crete.

Awards & Scholarships

ICS-FORTH Graduate Scholarship August 2024 – July 2025
Working on GP-GPU multitenancy under the umbrella of the AERO project. Heraklion, Greece

DATE Young People Programme University Fair Award March 2024
«Hardware and Software Designs for High Performance and Reliable Space Processing» — joint recipient *DATE[24]*

Elisabet Karamintzou Award July 2023
Awarded to the 3 highest undergrad GPAs of the 2019 graduating class. University of Crete

Stelios Orphanoudakis Scholarship 2019–2022
Awarded to the 3 best-performing CS students from UoC each year. ICS-FORTH