Andronikakis Andreas,
Research Prompt & Data Engineer

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Education

February 2025 — **M.Phil, Computer Science, University of Manchester, Manchester, United Kingdom**
Topic: *Performance Analysis for Memory Optimisations of Managed Graph Databases on NUMA Architectures*

2017 - 2025 — **Ph.D. Candidate, Computer Science, University of Manchester, Manchester, United Kingdom**
Topic: *Performance Analysis of Memory Optimisations of Managed Graph Databases on NUMA Architectures*

- Development of Neo4j on Maxine VM (`https://github.com/beehive-lab/Maxine-VM`)
- Detailed Performance Analysis of Neo4j on NUMAscale architectures
- Research on co-Design optimisations for Graph databases:
  - Compiler Optimisations (data aware memory allocation, gpu acceleration etc.)
  - GC optimisations (GC tuning etc.)

2009 - 2017 — **Diploma (5-year program), Electronic and Computer Engineering, Technical University of Crete, Chania, Greece**
Diploma Thesis: *Memory System Evaluation for Disintegrated Cloud Servers*. *Grade 7.18/10*

Employment Experience

Jan 2025 – Present — **Research Prompt Engineer** University of Manchester, Manchester, United Kingdom, EU Horizon Project INCODE (Grant Agreement No. 101092851) *Java Applications with TornadoVM: A Fine-Tuned LLM Approach*

- Design and fine-tune large language models (LLMs) to suggest TornadoVM optimisations for Java applications.
- Curate datasets combining Java code, TornadoVM configurations, and benchmark results.
- Integrate LLM-generated optimisation hints into TornadoVM and contribute to its open-source development.
- Benchmark and evaluate runtime/compiler performance guided by LLM suggestions.

Employment Experience (continued)

Jan 2023 – Dec 2024

Data Engineer / Research Assistant University of Manchester, Manchester, United Kingdom, EU Horizon Project INCODE (Grant Agreement No. 101093069)

- Focus on data analysis and benchmarking of Neo4j and other managed workloads on NUMA architectures.
- Develop scripts and automation tools (Python, Bash) to support compiler/runtime optimisation studies.
- Analyze runtime characteristics and tune memory layouts for managed applications.

Aug 2022 – Dec 2022

Research Assistant University of Manchester, Manchester, United Kingdom, EU Horizon Project ENCRYPT (Grant Agreement No. 101070670)

- Conducted benchmarking and data analysis on the Neo4j graph database as part of ongoing research into memory and runtime optimisations for managed workloads.
- Collected and structured datasets to support architectural performance tuning and workload profiling on MaxineVM.

May 2022 – Jul 2022

Research Assistant University of Manchester, Manchester, United Kingdom, Horizon 2020 ELEGANT Project (Grant Agreement No. 101004274)

- Supported research on managed runtimes for Big Data platforms deployed on heterogeneous cloud architectures and IoT environments.

Mar 2017 – Jun 2017

Research Software Engineer (Intern) University of Manchester, Manchester, United Kingdom, Horizon 2020 ACTiCLOUD Project (Grant Agreement No. 732366)

- Ported the Maxine Virtual Machine to the Aarch64 instruction set architecture (ISA).
- Debugged the C1X and T1X compilers for the Aarch64 backend.
- Developed testing automation tools using Python and Java (JUnit).

Mar 2016 – Jun 2016

Software Engineer Focus Photography, Chania, Greece

- Developed a performance monitoring and reporting system for company photographers using Java.

Jun 2013 – Sep 2013

Technical and Supporting Staff (Internship) Information Technology Department, Chania Nautical Club, Chania, Greece

Research Publications

1. Andronikakis, A. (2025). *Performance analysis for memory optimisations of managed graph databases on numa architectures* (MPhil Thesis, University of Manchester).
2. Papadakis, O., Andronikakis, A., Foutris, N., Papadimitriou, M., Stratikopoulos, A., Zakkak, F. S., … Kotselidis, C. (2023a). A multifaceted memory analysis of java benchmarks. In *Proceedings of the 20th acm sigplan international conference on managed programming languages and runtimes* (pp. 70–84). Cascais, Portugal: ACM. doi:10.1145/3617651.3622978
3. Papadakis, O., Andronikakis, A., Foutris, N., Papadimitriou, M., Stratikopoulos, A., Zakkak, F. S., … Kotselidis, C. (2023b). Scaling up performance of managed applications on numa systems. In *Proceedings of the 2023 acm sigplan international symposium on memory management* (pp. 1–12). Orlando, FL, USA: ACM. doi:10.1145/3591195.3595270
4. Alachiotis, N., Andronikakis, A., Papadakis, O., Theodoropoulos, D., Pnevmatikatos, D., Syrivelis, D., … Zyulkyarov, F. (2019). Dredbox: A disaggregated architectural perspective for data centers. In C. Kachris, B. Falsafi & D. Soudris (Eds.), *Hardware accelerators in data centers* (pp. 35–56). Cham: Springer International Publishing. doi:10.1007/978-3-319-92792-3_3
5. Nisbet, A., Zakkak, F. S., Apreotesei, I., Andronikakis, A., Luján, M. & Kotselidis, C. (2018). *Enabling virtual machine research on arm-based iot devices*. doi:10.13140/RG.2.2.25147.05921
6. Zakkak, F. S., Nisbet, A., Hartley, T., Foutris, N., Papadakis, O., Andronikakis, A., … Kotselidis, C. (2018). On the future of research vms: A hardware/software perspective. In *Conference companion of the 2nd international conference on art, science, and engineering of programming* (pp. 51–53). Nice, France: ACM. doi:10.1145/3191697.3191729

Teaching

Oct 2017-Jan 2019 — **(COMP15111) Fundamentals of Computer Architecture**

- Processors, binary representations, fetch-execute cycle, registers, ARM code for: Basic data types and expressions, data structures, control structures, functions, input/output, interrupts

Oct 2018-Jan 2019 — **(COMP12111) Fundamentals of Computer Engineering**

- Introduction to basic logic and logic gates, combinatorial and sequential blocks, basic CAD tools to aid in the design of a basic computer system, hardware description languages (Verilog), logic level implementation of a simple processor

Feb 2018-May 2018 — **(COMP25212) System Architecture**

- Advanced architectural techniques: Caching, Pipelining, Multi-Threading, Multi-Core, File System Support, Virtual Machines

Skills

Languages	Greek (Native Speaker), English (C1 - Effective Operational Proficiency, State Certificate of Foreign Language Proficiency), German (Zertifikat B2, Goethe Institut).
Programming	Java, Python, C/C++, R, Go, C#.NET, Bash, SQL, Cypher, Prolog, PHP, XML/XSL, Visual Basic.NET, ASP.NET, MIPS Assembly, VHDL, Pascal, Arduino Wiring, Flex/Bison.
AI & Machine Learning	Large Language Models (LLMs), Generative AI, AI-Assisted Code Optimisation, Prompt Engineering, Unsloth, LoRA, Hugging Face , OpenAI API, DeepSeek, LLaMA, Mistral, Phi, Qwen, Dataset Curation, PyTorch, Model Deployment & Monitoring, Automated ML Workflows, ML Pipelines.
Data Science & Analytics	Data Analysis, Statistical Modeling, A/B Testing & Experiment Design, Customer Lifetime Value Analysis, Data Visualization & Storytelling, Power BI.
Data Engineering	Databases (Neo4j), MySQL, SQLite, Data Collection and Benchmarking, Performance Profiling, dbt, Airflow, MLflow, Apache Kafka, Spark, Data Warehousing, Terraform.
Parallel & Heterogeneous Computing	TornadoVM, MaxineVM, OpenCL, CUDA, NUMA Architectures, Parallel Programming, Heterogeneous Computing (GPU/FPGA/CPU), Compiler & Runtime Optimisations, JVM Optimisations.
Platforms & Tools	Docker, Git/GitHub, Intel PIN, DRAMSim2, Vivado, Xilinx IDE, MAGIC VLSI, Spice, JUnit, Linux Shell, Google Cloud Platform, AWS.
Web Development	HTML, CSS, JavaScript, Apache Web Server, Tomcat Web Server.
Other Skills	Academic Research, Research Software Engineering, Teaching, Technical Writing, Open-Source Development, EU Research Projects, Strategic Thinking, Business Acumen, Cross-functional Collaboration, Mentoring & Knowledge Sharing, Curious and Initiative-Driven Mindset, LaTeX Typesetting and Publishing.

Scholarships

2019 **Google**, Google Compiler Summit of 2019. Full Sponsorship, Munich, Germany.

Scholarships (continued)

2018 **HiPEAC**, Summer school on Advanced Computer Architecture and Compilation for High-Performance. Full scholarship for summer school participation, Fiuggi, Italy.

2017 **University of Manchester**, Awarded a school scholarship from the Computer Science department of the University of Manchester,covering the PhD tuition fees and a yearly stipend, Manchester, UK.

References

Available on Request