

Curriculum Vitae (online version) – 19/02/2024

Dr Philippos Papaphilippou

Email: philippos (at) philippos.info

Nationality: Cypriot

Date of birth: 1993

Academic Education

PhD in Computer Science – High Performance, Embedded and Distributed Systems (HiPEDS)

Imperial College London, London (UK)

Duration: 1 October 2017 - 1 October 2021

EPSRC – HiPEDS Centre for Doctoral Training (CDT), with sponsorship from dunnhumby

Graduate teaching assistant: 202 Algorithms II (17/18), 502 Operating Systems (17/18), 332 Advanced Computer Architecture (17/18-20/21), 113 Introduction to Computer Architecture (19/20)

Thesis title: Reconfigurable Acceleration of Big Data Analytics [link](#)

Supervisor: Prof. Wayne Luk

Internal and external examiner: Dr. Thomas Heinis, Prof. Dirk Koch

M.Phil in Advanced Computer Science

University of Cambridge – Wolfson College, Cambridge (UK)

Duration: 1 October 2016 - 30 June 2017

MPhil dissertation: Performance Tuning for Deep Learning on a Many-core Processor [pdf](#)

Supervisor: Prof. Robert Mullins

Module selection: R05 Chip Multiprocessors (75.5%), L41 Advanced Operating Systems (80%), L11 Algebraic Path Problems with applications to Internet Routing (74.33%), L42 Machine learning and algorithms for data mining (72%), P35 System on Chip Design and Modeling (79.5%)

Grade: 75.53/100 [Distinction]

Bachelor (BSc) of Computer Science

Duration: 11 September 2012 - 15 June 2016

University of Cyprus, Nicosia (Cyprus)

Course Specialization: Computer Systems and Networks

Thesis: Designing a Modern Block Replacement Policy for Last-Level Cache
[link](#)

Supervisor: Prof. Yanos Sazeides

GPA: 8.82/10.0 [Excellent] (Rank: 2/67)

Employment

HCI Assistant Professor in Computer Science (10 Aug 2023 - present)

Trinity College Dublin, Ireland

School of Computer Science and Statistics, Human Capital Initiative (HCI)

Senior mobile CPU Architect (1 Oct 2021 - 31 Jul 2023)

Huawei Technologies Research & Development (UK) Ltd, Cambridge (UK)

Probation result: Excellent

Awards: Best Technological Diplomat Award, Future Star 2022

Publications

Journal papers

Philippos Papaphilippou, Thiem Van Chu "Efficient deadlock avoidance for 2D mesh NoCs that use OQ or VOQ routers" Transactions on Computers 2024
[pdf](#) [link](#) [source](#) [bib](#)

Philippos Papaphilippou, Kentaro Sano, Boma A. Adhi, Wayne Luk
"Experimental survey of FPGA-based monolithic switches and a novel queue balancer" IEEE Transactions on Parallel and Distributed Systems 2023 [pdf](#)
[link](#) [source](#) [bib](#)

Philippos Papaphilippou, Wayne Luk and Chris Brooks "FLiMS: a Fast Lightweight 2-way Merger for Sorting" IEEE Transactions on Computers 2022
[pdf](#) [link](#) [source](#) [visualisation](#) [bib](#)

Philippos Papaphilippou, Jiuxi Meng, Nadeen Gebara and Wayne Luk
"Hipernetch: High-Performance FPGA Network Switch" ACM Transactions on Reconfigurable Technology and Systems (TRETs) 2021 [link](#) [source](#)

Stefan Krieg, Thomas Luu, Johann Ostmeyer, Philippos Papaphilippou and Carsten Urbach “Accelerating Hybrid Monte Carlo simulations of the Hubbard model on the hexagonal lattice” Computer Physics Communications, 2019 [link](#)

Conference papers

Philippos Papaphilippou, Myrtle Shah “FPGA-extended General Purpose Computer Architecture” The 18th International Symposium on Applied Reconfigurable Computing (ARC) 2022 [pdf](#) [link](#) [source](#) [program](#) [slides](#) [bib](#)

Philippos Papaphilippou, Chris Brooks and Wayne Luk “An Adaptable High-Throughput FPGA Merge Sorter for Accelerating Database Analytics” The International Conference on Field-Programmable Logic and Applications (FPL) 2020 [pdf](#) [link](#) [source](#) [program](#) [slides](#) [visualisations](#) [pitch](#) [bib](#)

Philippos Papaphilippou, Jiuxi Meng and Wayne Luk “High-performance FPGA network switch architecture” The 28th ACM/SIGDA International Symposium on Field-Programmable Gate Arrays (FPGA) 2020 [pdf](#) [link](#) [slides](#) [source](#) [program](#) [bib](#) (Best Paper Candidate)

Philippos Papaphilippou, Chris Brooks and Wayne Luk “FLiMS: Fast Lightweight Merge Sorter” International Conference on Field-Programmable Technology (FPT) 2018 [pdf](#) [link](#) [slides](#) [source](#) [program](#) [visualisation](#) [bib](#)

Philippos Papaphilippou and Wayne Luk “Accelerating database systems using FPGAs: A survey” The International Conference on Field-Programmable Logic and Applications (FPL) 2018 [pdf](#) [link](#) [program](#) [bib](#)

Conference (short) and workshop papers

Philippos Papaphilippou, Zhiqiang Que and Wayne Luk “Efficiently Removing Sparsity for High-Throughput Stream Processing” The International Conference on Field-Programmable Technology (FPT) 2023 [pdf](#) [link](#) [source](#) [program](#) [slides](#) [visualisation](#) [bib](#)

Philippos Papaphilippou, Kentaro Sano, Boma A. Adhi and Wayne Luk “Efficient Queue-Balancing Switch for FPGAs” The International Conference on Field-Programmable Technology (FPT) 2021 [pdf](#) [link](#) [slides](#) [program](#) [bib](#)

Philippos Papaphilippou, Paul H. J. Kelly and Wayne Luk “Simodense: a RISC-V softcore optimised for exploring custom SIMD instructions” The International Conference on Field-Programmable Logic and Applications (FPL) 2021 [pdf](#) [link](#) [source](#) [program](#) [bib](#)

Philippos Papaphilippou, Paul H. J. Kelly and Wayne Luk “Extending the RISC-V ISA for exploring advanced reconfigurable SIMD instructions” The Fifth Workshop on Computer Architecture Research with RISC-V (CARRV 2021) (co-located with ISCA 2021) [pdf](#) [slides](#) [source](#) [program](#) [bib](#)

Philippos Papaphilippou, Paul H. J. Kelly and Wayne Luk “Pangloss: a novel Markov chain prefetcher” The 3rd Data Prefetching Championship (DPC3) (co-located with ISCA 2019) [pdf](#) [slides](#) [source](#) [program](#) [bib](#)

Philippos Papaphilippou, Holger Pirk and Wayne Luk “Accelerating the merge phase of sort-merge join” The International Conference on Field-Programmable Logic and Applications (FPL) 2019 [pdf](#) [link](#) [slides](#) [source](#) [program](#) [bib](#)

Other publication-related

Demos or posters

Philippos Papaphilippou and Wayne Luk “Accelerating Big Data Analytics Using FPGAs” The 8th Heidelberg Laureate Forum 2021 [video](#)

Philippos Papaphilippou, Paul H. J. Kelly and Wayne Luk “Challenges of highly-integrated FPGAs working as custom RISC-V instructions (poster abstract)” Summer School ACACES 2021

Philippos Papaphilippou, Paul H. J. Kelly and Wayne Luk “Demonstrating custom SIMD instruction development for a RISC-V softcore (demo abstract)” The International Conference on Field-Programmable Logic and Applications (FPL) 2021 [pdf](#) [link](#) [source](#) [bib](#)

Philippos Papaphilippou, Wayne Luk, Chris Brooks and Holger Pirk “Accelerating database analytics on FPGAs and SIMD processors (poster abstract)” Summer School ACACES 2019

Research Internships

Trainee/intern at RIKEN Center for Computational Science: Created building blocks for high-performance computing applications on FPGA(s) with high-bandwidth memory with Dr. Kentaro Sano, Processor Research Team, R-CCS, Japan (remotely), 06/2021-9/2021

Microsoft contractor/intern: Migrated a Verilog design for sorting to a novel FPGA HLS framework called Sandpiper, provided bug reports and provided feedback for the language features. (Microsoft Sandpiper was still considered in its early stages of development.), USA (remotely), 03-05/2021

Summer of HPC 2017 Participant: The project aimed to eliminate the simulation time of a Quantum Monte Carlo simulator for carbon nanotubes by using data science techniques. This was achieved by creating an online optimization algorithm that balances the accuracy of the simulator for better performance – PRACE (Partnership for Advanced Computing in Europe) – Supervisor: Dr. Stefan Krieg – Forschungszentrum Jülich, Germany, 07-08/2017

Research assistant/honour intern: Studied about CPU Last-Level Cache Block Replacement Policies, implemented Cache simulators and tested various Cache Algorithms (LRU based, DRRIP based and new variations) for single and multi-program workloads in functional and timing simulations; explored a wide Design Space of cache configurations using the Cy-Tera HPC Facility – with Prof. Yanos Sazeides – Xi Computer Architecture Research Lab – University of Cyprus, 06/2013 - 9/2016

Intern at CaSToRC: Computation-based Science and Technology Research Center, The Cyprus Institute. Constructed and evaluated different Neural Network Architectures to assist parameter optimisation and runtime elimination in LatticeQCD Simulations – with Prof. Constantia M. Alexandrou – 06-08/2016

Intern: Developed a GATE (General Architecture for Text Engineering) plug-in to assist collecting verbs that connect specific strings using Natural Language Processing in texts for estimating article similarity – with Prof. Georgia M. Kapitsaki – Software Engineering and Internet Technologies Laboratory (SEIT) – University of Cyprus, 08/2014

Honour intern: Developed a Windows Phone geolocation application with another student. Utilized the smartphone sensors to draw real-time path on maps for indoor navigation – with Prof. Demetris Zeinalipour – Data Management Systems Laboratory – University of Cyprus, 06-07/2013

Honours, Awards, Grants

2022

“Best Technological Diplomat Award”, “Future Star 2022” Cambridge Research Center, Huawei R&D, UK

Development board donation by element14 (Microchip Polarfire FPGA Eval Kit) for roadtest review (3 out of 32 applicants)

2021

ACACES summer school attendance funding by HiPEAC

2020

Best Paper Nominee at The 28th ACM/SIGDA International Symposium on Field-Programmable Gate Arrays (FPGA) 2020

FPGA'20 Travel Grant by ACM

The 8th Heidelberg Laureate Forum participant (but later changed to a remote event)

Development board donation by element14 (MaaXBoard) for roadtest review (10 out of 298 applicants)

2019

ISCA 2019 Student Travel Grant

ACACES summer school attendance funding by HiPEAC

MaRIONet Manycore PhD Summer School attendance funding

2017

4-year PhD studentship by dunnhumby Ltd. UK

2015

1st prize, "EU Code Week Competition" National Competition for University Students, of Cyprus Computer Society

2014

National Innovation Winner, ImagineCup 2014 of Microsoft Cyprus, in a team of four students

2011

10th place, "Iakovos Patatsos" Provincial competition of Cyprus Mathematical Society

1st place (Silver Medal) in Informatics, International Kangourou Competition 2010-2011, National competition of Thales Foundation Cyprus

2010

4th place, "Iakovos Patatsos" Provincial competition of Cyprus Mathematical Society

6th place, "Evagoras Palikarides" National competition of Cyprus Mathematical Society

2009

"Iakovos Patatsos" Provincial competition of Cyprus Mathematical Society

12th place, "Evagoras Palikarides" National competition of Cyprus Mathematical Society

2008

“Iakovos Patatsos” Provincial competition of Cyprus Mathematical Society
4th provincially, 4rd Pancyprian Physics Olympiad

2007

Bronze Metal, 8th Mathematics Olympiad of Cyprus Mathematical Society
4th provincially, 3rd Pancyprian Physics Olympiad

2006

10th place, “Iakovos Patatsos” Provincial competition of Cyprus Mathematical Society

2005

Silver Metal, 6th Mathematics Olympiad of Cyprus Mathematical Society

2003

1st place, “Radiomathon” National Painting Competition for Elementary Schools

Other Presentations

“Huawei Tech Talk – Pangloss+: a novel Markov chain adaptive prefetcher”
University of Cambridge 01/2023 [link](#)

“Faster and greener computer processors by using genetic algorithms”,
Invited external lecture for the course Machine Learning and Predictive
Analytics at UWE Bristol 07/2022

“502 Operating Systems: Lab 1” Full lab tutorial as a GTA task at Imperial
College London 2020

“High-performance FPGA network switch architecture”, Invited external
presentation at Xilinx, San Jose (same presentation after FPGA'20) 02/2020
[slides](#)

“Raspberry pi as a Web Server tutorial”, Web Development Workshop Series –
Cyprus Computer Society (2015)

Presented a Windows Phone project with another student at 5th Workshop
for High School Students at University of Cyprus (2014) [slides](#)

“Graphical Approach of Trigonometric Numbers in a Computer Application”,
Student Mathematics Seminar by Cyprus Mathematical Society, Paphos
(Cyprus) 02/2011 [pdf](#)

Other Information

Memberships

ACM Professional Member (2022), IEEE Member (2022), IEEE Region 8 Student Member (2013-2021), ACM Student (2017, 2019), Cyprus Computer Society (2015)

Computing skills

Mainly programming/scripting in: C/C++, Verilog, Python, Java, Javascript, bash, gnuplot, LaTeX

Environment/IDEs: Linux (RPM, Arch and Debian-based), NetBeans, Vivado, Libero

Tools: Icarus Verilog, Verilator, ChampSim, GEM5, VirtualBox, Intel Pin, GTKWave, DEAP

Past experience: Atom, Solaris Studio, Eclipse, PCSpim, MARSSx86, Model-Sim, VisualStudio, Xilinx ISE, SimAlpha, ArgoUML, Microsoft Visio, Pascal, Actionscript, C#, VHDL, SystemC, JavaFX, Android and Windows phone development, FreeBSD and Windows, OpenMP, MPI, OpenCL, MapReduce/Hadoop, Condor, Slurm, Opnet, CMP\$im, GATE, Neuroph Studio/API, Qemu, scikit-learn, Intel SIMD Intrinsics, Intel Vtune, Sandpiper, two.js, Gephi

Languages

Greek: native

English: CEFR C1 – IELTS Overall Score: 7.5/9 in 2016

German: CEFR B1 – Zertifikat Deutsch B1

Secondary Education

(Lyceum graduate)

Pancyprian Gymnaseum, Nicosia (Cyprus)

Core Subjects: Mathematics, Biology, Physics, Chemistry

Overall grade: 18.1/20

Other projects

3d N-Body simulator – Presented as a midterm project for the course “FYS 012 – Physics and Applications” at the University of Cyprus 2016 [link](#)

Developed a computer simulation program about light (Physics) later used for teaching pre-service educators, Learning in Science Group - University of Cyprus 2008 [link](#)

Military Service

Duration: July 2011 - September 2012

Cypriot National Guard, (Cyprus)

Seminars/Training Schools

8th Heidelberg Laureate Forum, 20-23 September, Virtually

ACACES 2021 – Seventeenth International Summer School on Advanced Computer Architecture and Compilation for High-performance Embedded Systems, 12-18 September, Fiuggi, Italy

Virtual ACACES 2020, Virtual HLF 2020, Virtual ASAP 2020, RISC-V Summit Virtual 2020, Quantum.Tech Online 2021

ACACES 2019 – Fifteenth International Summer School on Advanced Computer Architecture and Compilation for High-Performance and Embedded Systems, 14-20 July 2019, Fiuggi, Italy

Manycore Summer School 2018 – MaRIONet The UK Manycore Network, 16-20 July 2018, University of Glasgow

ACACES 2018 – Fourteenth International Summer School on Advanced Computer Architecture and Compilation for High-Performance and Embedded Systems, 8-14 July 2018, Fiuggi, Italy

MaxCompiler Workshop – London, 20-21 June 2017

2nd International Summer School Training on Manufacturable and Dependable Multi-core Architectures at Nanoscale MEDIAN ISTS 2015 (Prague) 07/2015

2nd Workshop on Cloud Computing in Cyprus: Opportunities and Challenges – Department of Computer Science, University of Cyprus & Microsoft Cyprus – 06/2015

4th LinkSCEEM General User Meeting – Cyprus Institute – 06/2014

Student Mathematics Seminar by Cyprus Mathematical Society, Paphos (Cyprus) 02/2011

Participated in Science Summer Club of University of Cyprus and presented a team project 2008

Extracurricular Activities

Violin Playing, Cycling, Listening to Classical (Bach, Fauré), Classical Organ (Durufié) and Jazz Music, Listening to philosophy podcasts