Marcin Copik

Zürich, Switzerland
✉ *marcin.copik@inf.ethz.ch*
mcopik.github.io

Education

2018– **PhD in Computer Science**, *ETH Zürich*.
Scalable Parallel Computing Lab. Supervisor: Prof. Torsten Hoefler

2014–2017 **M.Sc. in Simulation Sciences**, *RWTH Aachen*, Germany, *Grade* 1.5.
Interdisciplinary program. Major subject: High-Performance Computing

VIII 2014 **Scuola Matematica Interuniversitaria**, *University of Perugia*, Italy.
Summer school in mathematics. Courses: Stochastic Processes, Functional Analysis

2012–2014 **B.Sc. in Mathematics**, *Silesian University of Technology*, Poland, *GPA* 4.6/5.0.
Finished two of three years program.

2010–2014 **B.Sc. in Computer Science**, *Silesian University of Technology*, Poland, *Grade* 5(A).
An engineering degree. Major subject: Software Engineering

Experience

VII-XI 2019 **Research Intern**, *Microsoft*, Redmond, WA.
Analyzing microarchitectural implications of serverless workloads. Supervisor: Bobbie Manne.

2017, 2018 **Mentor**, *Google Summer of Code*, Organization: The STE||AR Group.

2016 – 2017 **Student Assistant**, *RWTH Aachen, High-Performance and Automaton Computing*, Aachen, Germany.
Benchmarking linear algebra frameworks.

IV–VIII 2016 **Research Assistant**, *Louisiana State University, STE||AR Group*, Baton Rouge, USA.
Integrating single-source GPU programming in HPX. Supervisor: Dr Hartmut Kaiser

2014 – 2016 **Student Assistant**, *Jülich Supercomputing Centre*, Jülich, Germany.
Develop tools for performance analysis of parallel applications at Scalasca. Supervisor: Dr Pavel Saviankou

2015 **Software Engineer**, *Google Summer of Code*, Organization: The STE||AR Group.
Integrating single-source GPU programming in HPX. Supervisor: Dr Hartmut Kaiser

2014 **Software Engineer**, *Google Summer of Code*, Organization: PRISM model checker.
Improve statistical model checking. Supervisors: Dr Vojtěch Forejt, Dr Dave Parker

2012–2013 **Student Assistant**, *The Institute of Theoretical and Applied Informatics*, Gliwice, Poland.
Implementing GPU simulator of Markov Chains, Supervisors: Dr Mateusz Nowak, Dr Artur Rataj

2012–2014 **Student Assistant**, *Silesian University of Technology*, Gliwice, Poland.
Implementing versions of ICP algorithm for registration of respiratory motion. Supervisor: Dr Dominik Spinczyk

Peer-Reviewed Publications

2022 **Copik M.**, Grosser T., Hoefler T., Bientinesi P., Berkels B. *Work-stealing prefix scan: Addressing load imbalance in large-scale image registration* IEEE Transactions on Parallel and Distributed Systems (TPDS), **DOI** 10.1109/TPDS.2021.3095230

2021 Besta M. [and 18 others, including **Copik M.**] *GraphMineSuite: Enabling High-Performance and Programmable Graph Mining Algorithms with Set Algebra* Proceedings of the 47th International Conference on Very Large Data Bases (VLDB'21), **arXiv** 2103.03653

2021 Besta M. [and 18 others, including **Copik M.**] *SISA: Set-Centric Instruction Set Architecture for Graph Mining on Processing-in-Memory Systems* Proceedings of the 54th Annual IEEE/ACM International Symposium on Microarchitecture (MICRO'21), **DOI** 10.1145/3466752.3480133

2021 **Copik M.**, Kwasniewski G., Besta M., Podstawski M., Hoefler T. *SeBS: A Serverless Benchmark Suite for Function-as-a-Service Computing* Proceedings of the 22nd International Middleware Conference (Middleware'21), **DOI** 10.1145/3464298.3476133, **arXiv** 2012.14132

2021 **Copik M.**, Calotoiu A., Grosser T., Wicki N., Wolf F., Hoefler T. *Extracting Clean Performance Models from Tainted Programs* Proceedings of the 26th Symposium on Principles and Practice of Parallel Programming 2021 (PPoPP'21), Acceptance Rate 21% (31/150), **DOI** 10.1145/3437801.3441613

2018 Barthels H., **Copik M.**, Bientinesi P. *The Generalized Matrix Chain Algorithm.* Proceedings of the 2018 International Symposium on Code Generation and Optimization (CGO 2018), Acceptance Rate 28.6% (30/105), **DOI** 10.1145/3168804

2017 **Copik M.**, Kaiser H. *Using SYCL as an Implementation Framework for HPX.Compute.* In Proceedings of the 5th International Workshop on OpenCL (IWOCL 2017), **DOI** 10.1145/3078155.3078187

2016 **Copik M.**, Rataj A., Woźna-Szczęśniak B. *A GPGPU-based Simulator for Prism: Statistical Verification of Results of PMC [extended abstract].* The Proceedings of the 25nd International Workshop on Concurrency, Specification and Programming (CS&P 2016)

2014 Spinczyk D., Karwan A., **Copik M.** *Methods for abdominal respiratory motion tracking.* Computer Aided Surgery, 19:1-3, 34-47, **DOI** 10.3109/10929088.2014.891657

Preprints

2021 **Copik M.**, Taranov K., Calotoiu A., Hoefler T. *rFaaS: RDMA-Enabled FaaS Platform for Serverless High-Performance Computing* **arXiv** 2106.13859

Presentations

2019 **Copik M.**, Hoefler T. *perf-taint: Taint Analysis for Automatic Many-Parameter Performance Modeling.* Supercomputing 2019 Poster, **Gold Medal at the ACM Student Research Competition.**

2017 **Copik M.**, Bientinesi P., Berkels B. *Parallel Prefix Algorithms for the Registration of Arbitrarily Long Electron Micrograph Series.* Supercomputing 2017 Poster, ACM Student Research Competition.

2016 **Copik M.**, *HPX and GPU-parallelized STL.* C++Now 2016. Aspen, USA

Awards

2021 Microsoft Research PhD Fellowship

2019 Gold Medal at the ACM Student Research Competition at ACM/IEEE Supercomputing 2019.

Skills (in order of experience)

Programming	C++, C, Python, Matlab, Java, Julia, Mathematica, R, Pascal, x86 assembly
Technologies	MPI, OpenMP, LLVM, OpenCL, SYCL, CUDA, C++AMP
Tools	Git, SVN, Mercurial, Make, CMake, autotools
Experience	serverless computing, parallel programming, cloud computing, performance modeling, GPU programming, CPU branch prediction, model checking

Activites

Teaching	Parallel Programming, Numerical Methods for CSE, Design of Parallel and High-Performance Computing, Compiler Design
Reviewing	ISC 2019, LLVM-HPC 2020

Master thesis

Title	*Parallel Prefix Algorithms for the Registration of Arbitrarily Long Electron Micrograph Series*
Supervisors	Prof. Paolo Bientinesi, Prof. Benjamin Berkels
Description	A parallel strategy for electron microscopy image registration based on a distributed prefix sum.

Bachelor thesis

Title	*GPU-accelerated stochastic simulator engine for PRISM model checker*
Supervisor	Prof. Tadeusz Czachórski
Description	Enhancement of an open-source probabilistic model checker PRISM with a new parallel simulator.

References

Prof. Torsten Hoefler
Scalable Parallel Computing Laboratory, ETH Zürich
htor@inf.ethz.ch