

# MARCIN COPIK | Curriculum Vitae

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🐙 GitHub • 🌐 Personal Website

## SUMMARY

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PhD student working on serverless programming models to bridge the gap between high-performance computing systems and cloud data centers.

## EDUCATION

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### ETH ZÜRICH

PhD in Computer Science

Supervisor: Prof. Torsten Hoefler

2018–  
Zürich, Switzerland

### RWTH AACHEN

MSc in Simulation Sciences

Grade: 1.5. Interdisciplinary program. Major subject: High-Performance Computing

2014–2017  
Aachen, Germany

### UNIVERSITY OF PERUGIA

Scuola Matematica Interuniversitaria

Summer school in mathematics. Courses: Stochastic Processes, Functional Analysis

VIII 2014  
Italy

### SILESIAN UNIVERSITY OF TECHNOLOGY

B.Sc. in Mathematics

GPA: 4.6/5.0. Finished two of three years program.

2012–2014  
Gliwice, Poland

### SILESIAN UNIVERSITY OF TECHNOLOGY

B.Sc. in Computer Science

Grade 5(A). An engineering degree. Major subject: Software Engineering

2010–2014  
Gliwice, Poland

## EXPERIENCE

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### RESEARCH INTERN

Microsoft

Analyzing microarchitectural implications of serverless workloads. Supervisor: Bobbie Manne.

VII–XI 2019  
Redmond, WA, USA

### MENTOR

Google Summer of Code

Mentoring students working on HPX.

2017, 2018  
Organization: The STE||AR Group

### STUDENT ASSISTANT

RWTH Aachen, High-Performance and Automaton Computing

Benchmarking linear algebra frameworks. Supervisor: Prof. Paolo Bientinesi.

2016 – 2017  
Aachen, Germany

### RESEARCH ASSISTANT

Louisiana State University, STE||AR Group

Integrating single-source GPU programming in HPX. Supervisor: Dr Hartmut Kaiser.

IV–VIII 2016  
Baton Rouge, LA, USA

### STUDENT ASSISTANT

Jülich Supercomputing Centre

Develop tools for performance analysis of parallel applications at Scalasca. Supervisor: Dr Pavel Saviankou.

2014 – 2016  
Jülich, Germany

### SOFTWARE ENGINEER

Google Summer of Code

Integrating single-source GPU programming in HPX. Supervisor: Dr Hartmut Kaiser.

2015  
Organization: The STE||AR Group

## SOFTWARE ENGINEER

Google Summer of Code

Improve statistical model checking. Supervisors: Dr Vojtěch Forejt, Dr Dave Parker.

2014  
Organization: PRISM model checker

## STUDENT ASSISTANT

The Institute of Theoretical and Applied Informatics

Implementing GPU simulator of Markov Chains, Supervisors: Dr Mateusz Nowak, Dr Artur Rataj.

2012–2013  
Gliwice, Poland

## STUDENT ASSISTANT

Silesian University of Technology

Implementing algorithms for registration of respiratory motion. Supervisor: Dr Dominik Spinczyk.

2012–2014  
Gliwice, Poland

## SKILLS

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### PROGRAMMING LANGUAGE

**Experienced:** C++ | Python | Java  
Pascal | x86 ASM

**Familiar:** Matlab | Julia | Mathematica | R |

### TECHNOLOGIES

MPI | OpenMP | LLVM | OpenCL | SYCL | C++AMP | Docker | Kubernetes

### TOOLS

Git | SVN | Mercurial | CMake | autotools | SLURM

### EXPERIENCE

serverless computing | parallel programming | cloud computing | performance modeling | GPU programming | CPU branch prediction | model checking

## HONORS & AWARDS

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### ACM/IEEE GEORGE MICHAEL MEMORIAL HPC FELLOWSHIP

Awarded for contributions into high-performance serverless.

2022

### GOLD MEDAL AT THE ACM STUDENT RESEARCH COMPETITION

ACM/IEEE Supercomputing 2022

1st place at the graduate students category.

2022

### AWS CLOUD CREDIT FOR RESEARCH APPLICATION

2022

### GOOGLE CLOUD RESEARCH CREDITS

2022

### MICROSOFT RESEARCH PHD FELLOWSHIP

Awarded for the 2021/2022 academic year.

2021

### GOLD MEDAL AT THE ACM STUDENT RESEARCH COMPETITION

ACM/IEEE Supercomputing 2019

1st place at the graduate students category.

2019

## PROFESSIONAL ACTIVITIES

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### REVIEWER

ISC 2019, LLVM-HPC 2020, International Journal of High Performance Computing Applications

### TEACHING

Parallel Programming, Numerical Methods for Computational Science and Engineering, Design of Parallel and High-Performance Computing, Compiler Design, Information Systems for Engineers

## PRESENTATIONS AND TALKS

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**Copik M.**, Calotoiu A., Hoefler T. "Software Resource Disaggregation for HPC with Serverless Computing", Supercomputing 2022 Poster, **Gold Medal at the ACM Student Research Competition**.

**Copik M.**, Chrapek M., Calotoiu A., Hoefler T. "Software Resource Disaggregation for HPC with Serverless Computing", SuperCompCloud at ACM/IEEE Supercomputing 2022 (SC22)

**Copik M.**, K., Calotoiu A., Hoefler T. "Interactive Computing with Serverless Functions in rFaaS", UrgentHPC at ACM/IEEE Supercomputing 2022 (SC22)

**Copik M.**, Calotoiu A., Grosser T., Wicki N., Wolf F., Hoefler T. "Extracting Clean Performance Models from Tainted Programs", SIAM Conference on Parallel Processing for Scientific Computing (PP22) minisymposium.

**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.**

**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.

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

## PEER-REVIEWED PUBLICATIONS

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**Copik M.**, Taranov K., Calotoiu A., Hoefler T. "rFaaS: RDMA-Enabled FaaS Platform for Serverless High-Performance Computing", IPDPS 2023, [arXiv 2106.13859](#)

Schmid L., **Copik M.**, Calotoiu A., Werle D., Reiter A., Selzer M., Koziolok A., Hoefler T. "Performance-Detective: Automatic Deduction of Cheap and Accurate Performance Models". ICS 2022, Acceptance Rate 24.2% (39/161), [DOI 10.1145/3524059.3532391](#)

Chelini L., Barthels H., Bientinesi P., **Copik M.**, Grosser T., Spaminato D. "MOM: Matrix Operations in MLIR.". 12th International Workshop on Polyhedral Compilation Techniques, [Paper](#)

**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](#)

**Copik M.**, Kwasniewski G., Besta M., Podstawski M., Hoefler T. "SeBS: A Serverless Benchmark Suite for Function-as-a-Service Computing", Middleware 2021, Acceptance Rate 31% (33/107), [DOI 10.1145/3464298.3476133](#)

**Copik M.**, Calotoiu A., Grosser T., Wicki N., Wolf F., Hoefler T. "Extracting Clean Performance Models from Tainted Programs", PPOPP 2021, Acceptance Rate 21% (31/150), [DOI 10.1145/3437801.3441613](#)

Besta M. [and 18 others, including **Copik M.**] "GraphMineSuite: Enabling High-Performance and Programmable Graph Mining Algorithms with Set Algebra", VLDB 2021, [arXiv 2103.03653](#)

Besta M. [and 18 others, including **Copik M.**] "SISA: Set-Centric Instruction Set Architecture for Graph Mining on Processing-in-Memory Systems", MICRO 2021, [DOI 10.1145/3466752.3480133](#)

Barthels H., **Copik M.**, Bientinesi P. "The Generalized Matrix Chain Algorithm.", CGO 2018, Acceptance Rate 28.6% (30/105), [DOI 10.1145/3168804](#)

**Copik M.**, Kaiser H. "Using SYCL as an Implementation Framework for HPX.Compute.", DHPCC++ Workshop at IWOCCL 2017, [DOI 10.1145/3078155.3078187](#)

**Copik M.**, Rataj A., Woźna-Szcześniak B. "A GPGPU-based Simulator for Prism: Statistical Verification of Results of PMC [extended abstract].", CS&P 2016

Spinczyk D., Karwan A., **Copik M.** "Methods for abdominal respiratory motion tracking.", Computer Aided Surgery 2014, [DOI 10.3109/10929088.2014.891657](#)

## PREPRINTS AND REPORTS

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**Copik M.**, Böhringer R., Calotoiu A., Hoefler T. "FMI: Fast and Cheap Message Passing for Serverless Functions", 2002, [Working copy](#)

**Copik M.**, Chrapek M., Calotoiu A., Hoefler T. "Software Resource Disaggregation for HPC with Serverless Computing", 2022, [Working copy](#)

**Copik M.**, Calotoiu A., Bruno R., Böhringer R., Hoefler T. "Process-as-a-Service: FaaS Stateful Computing with Optimized Data Planes", 2022, [Working copy](#)

**Copik M.**, Calotoiu A., Taranov K., Hoefler T. "FaaSKeeper: Scalable and Consistent Storage as a Serverless Service", [arXiv 2022 2203.14859](#)