# Davide Spataro

Software Engineer

## Personal Info


14 February 1990

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## About me

I am a curious and passionate software engineer working at **ASML** on the next generation of *E*xtreme Ultraviolet (EUV) photo-lithography machines and my interests include, but are not limited to, C++, parallel programming and GPGPU. I am an active StackOverflow user, avid reader of technical and scientific books and articles. Participating in competitive programming competitions and writing blog articles on C++ and algorithms is how I keep challenging myself daily. I feel naturally inclined to work in a team, but I am also capable of tackling and solving complex problems autonomously. In addition, I am always looking for people and experiences from which I can learn and improve. I was born and raised in Nicotera, Southern Italy. At the age of 12, I started programming and studied piano and music for 10 years until at the age of 18 when I decided to fully concentrate on Computer Science. Long enough to make me addicted to classical and jazz music. Besides that, I am passionate about photography and investing. When I am not coding I am most likely either paddling in the Mediterranean sea, lifting weights in the gym or fighting gravity on a race bike. I drink a lot of coffee.

## Languages

Italian

English

Dutch

(*)[Skill scale: 0 (Awareness) to 10 (Expert).]

## Key skills

| | |
|---|---|
| **Fundamentals** | Algorithms and data structures, TDD, OOP, Design Patterns, SQL |
| **C/C++11 and newer** | Meta-programming, standard, boost, google test/mock libraries |
| **Build and Version Control** | `git`, `GNU make`, `CMake` |
| **Concurrency** | Threading, CUDA, OpenCL, MPI, OpenMP, OpenACC |
| **OS and Scripting** | Linux, Bash, Windows |

## Experience

**since 2018** **Software Design Engineer** — **ASML, The Netherlands**
- Implemented C/C++-11 core software for lithography overlay optimization.
- Benchmarking of metrology code aimed at improving speed of execution.
- Adotped TDD and piloting CI transition (Jenkins).
- Increased UT coverage for legacy C/C++ code.

2017 Ph.D. Research Visiting Student — University of Warwick, United Kingdom
- Implementation of an efficient solve for tridiagonal linear system within OPS
- Optimization using Intel SIMD intrinsics (SSE)

2016 Ph.D. Research Visiting Student — University of Edinburgh, Scotland
- Investigated parallel and distributed visualization strategies for exascale simulations as part of the VELaSSCo project.
- Prototype implementation for multi-GPU rendering using C++14.

2014-2017 Ph.D. Student & Teaching Assistant — University of Calabria, Italy
- Teaching assistant for the course of *UI and event programming* for $\approx 100$ attendees.
- The students were, eventually, able to program a full fledged 3D videogame in Java.

2013-2014 Academic Tutor — University of Calabria, Italy
- Tutoring students for the course of *object oriented programming* and *algorithm and data structures*

## Education

**2014-2018** **Ph.D. in Mathematics and Computer Science** — University of Calabria, Italy
*Seamless acceleration of numerical regular grid methods on many-core systems.*
- Designed a DSL aimed at both efficient and quick implementation of CA and FDM on multi-core/nodes/accelearators systems .
- Implemented a family of `C/C++/OpenCL/MPI` libraries

2011-2014 M.Sc. **magna cum laude** in Computer Science — University of Calabria, Italy
*Accelerating the new* `SCIARA-fv3` *numerical model by different GPGPU strategies.*
- Investigated GPGPU parallelization for a computationally heavy fluid-dynamic model.
- Achieved speedups up to $200x$ enabling it for risk map generation.
- Implemented a 3D `OpenGL` interactive UI

2008-2011 B.Sc. in Computer Science — University of Calabria, Italy
`B-finder` *a system for automatic detection of buildings from aerophotogrammetries.*
- Designed an active contour model like algorithm for accurate buildings segmentation from aerial and satellite images.
- Matlab prototype implementation used to identify non-authorized constructions.

## Publications*

2018 A first multi-GPU/multi-node implementation of the open computing abstraction layer
Journal of Computational Science, Volume 32, March 2019, Pages 115-124

2018 The Open Computing Abstraction Layer for Parallel Complex Systems Modeling on Many-Core Systems
Journal of Parallel and Distributed Computing, Volume 121, 53-70,

2016 Multi-Agent System with Multiple Group Modelling for Bird Flocking on GPU
Proceedings of The 2016 International Conference on Parallel, distributed and Network-Based Processing (PDP), February 17-19 2016, Crete, Greece

2015 Efficient Lava Flows Simulations with OpenCL: A preliminary application for Civil Defence Purposes
Proceedings of The $10^{th}$ International Conference on P2P, Parallel, Grid, Cloud and Internet Computing, November 4-6, 2015, Krakow, Poland

*Full list on `www.davidespataro.it`