

Curriculum Vitæ et Studiorum

Davide Spataro

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1 Personal information and research activity

1.1 Personal information

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1.2 Current position

Phd student at department of Mathematics and Computer Science of the university of Calabria. My research is manly focused on computational fluid-emodynamics.

1.3 Research interests

Parallel Computing (GPGPU Computing, OpenMP, MPI, OpenACC, CUDA), Parallel Computational Paradigms (Cellular Automata), Discrete Modeling and Simulation, Scientific Visualization (Computer Graphics, Real-time rendering), Mobile developing (Android).

1.4 Research activity

Starting from my MSc degree Thesis, I am collaborating with researchers from the University of Calabria (Italy) and from the Plymouth University (UK) researching on **Parallel Computing, Modeling and Simulations** in Computational Fluid Dinamics, and **Scientific Visualization**.

In particular, in the **modelling and simulating field** I exploit the computational power of Cellular Automata to model complex natural phenomena.

In the context of **Parallel Computing** my research focuses mainly on CUDA (besides MPI, OpenMP, OpenACC) application to accelerate complex systems models (e.g. simultaneous Cellular Automata models simulations).

1.5 Short Biography

Davide Spataro was born the 14th Febrary 1990 and grew up in Nicotera, a small city in Southern Italy. He attended the secondary school focusing on humanities and in 2008 he moved to Cosenza, city in which he lives, studies and works collaborating with some researcher of the Department of Mathematics and Computer Science on the modellation and simulation of complex systems and on computational fluid-dynamics. He studied piano and music since he was eight for ten years, long enough to make him addicted to classical and jazz music. In 2011, he obtained the Bachelor of Science in Computer Science at the University of Calabria. and since 2014 he holds the Master of Science (**summa cum laude**) at the University of Calabria. He is creative, and looking forward to earn a respectable scientist's profile, he is highly motivated and willing to learn and to work hard to achieve results. He also loves coffee.

2 Education

2.1 University education

Master of Science in Computer Science. I obtained the MSc degree in Computuer Science (**summa cum laude**) on **July 2014** at the University of Calabria.

Thesis title: Accelerating the new SCIARA-fv3 numerical model by different GPGPU strategies.
Thesis Supervisors: Prof. William Spataro, Prof. Donato D'Ambrosio

During the two-year degree the main courses I attended and exams taken are listed below:
Data Warehousing and Data Mining, Knowledge Management, Modeling and Simulation, Numerical Approximation and Algorithms, Network and Computer Security, Parallel Algorithms and Distributed Systems, Theoretical Computer Science, Intelligent Systems, Cryptography and Coding Theory.

Bachelor of Science in Computer Science. I obtained the BSc degree in Computer Science on **December 2011** at the University of Calabria.

Thesis title: B-finder a system for automatic detection of buildings from aerophotogrammetries.
Thesis Supervisors: Prof. Pasquale Rullo, Prof. Salvatore Iiritano

During the three-year degree the main courses I attended and exams taken are listed below:
Analysis, Discrete Mathematics, Integral Calculus, Physics, Operations Research, Probability Theory and Statistics, Computer Architecture, Data bases, Object-Oriented Programming, Algorithms and Data Structures, Computer Graphics, Graphical Interfaces and Event-Oriented Programming, Artificial Intelligence, Formal Languages and Compilers, Operating Systems and Networks, Software Engineering, Web based Information systems.

3 Research stays

3.1 National stays

- From 01/06/2011 to 21/12/2011 I had a **Stage** at Exeura. During the stage period I worked on the development of my BSc Thesis improving my computer vision, MATLAB, and image processing skills.

3.2 International stays

- From 01/03/2013 to 31/10/2013 I had a **research visit** at the School of Computing and Mathematics, Plymouth University (UK) under the supervision of the Prof. Davide Marocco. During the visit period I worked on my Thesis by applying GPGPU techniques to the parallelization of the SCIARA-fv3 cellular automata model.

4 Publications

- Spataro D., D'Ambrosio D., Filippone G., Spataro W., **Implementation of the SCIARA-fv3 parallel numerical model for lava flow simulation by different GPGPU strategies** *International Journal of High Performance and Applications*. Accepted.
- Spataro W., D'Ambrosio D., Filippone G., Spataro D., G. Iovine, D. Marocco, **Lava flow modeling by the SCIARA-fv3 parallel numerical model**, *Proceedings of The 2014 International Conference on Parallel, Distributed and Network-Based Processing (PDP)*, Turin, Italy, Feb. 12-14, 2014, pp 330-338.
- G. Filippone, R. Parise, D. Spataro, D. D'Ambrosio, R. Rongo, and W. Spataro, **Evolutionary applications to Cellular Automata models for volcano risk mitigation**, *Proceedings of The 2014 International Conference on Workshop on Artificial Life and Evolutionary Computation (WIVACE)*, May 14-15 2014, Vietri sul Mare, Salerno, Italy.

5 Projects

5.1 Academical

CuCCAI - CUDA Complex Cellular Automata library A CUDA powered library CuCCAI, acronym for Cuda complex cellular automata library, capable of hiding all the complexity behind the GPU/GPU Complex Cellular Automaton programming process. Cellular automata (complex and classic), CUDA, GPGPU.

Robocode Competition I developed, in a team of three, a robocode robot using the Robocode framework within the context of the final exam and competition of the Intelligent System's course during Master's degree. My robot wins the competition. During this project i worked in a team of three people mainly applying concept and techniques from : Artificial intelligence and data mining and gathering.

A 3D videogame: Big-Entity I developed, in a team of two, a 3D videogame alongside a level editor using java and jMonkey 3D engine and jBox2D physics engine. It was developed as project for the course of Advanced Programming during my bachelor's degree. During this project i worked in a team of three people mainly applying concept and techniques from: 3D programming, event programming, XML domain modelling, advanced data structures and algorithms.

Parallel linear system solver I developed, using MPI and OpenMP a parallel program for solving linear system of equations. It was part of the exam of Parallel algorithms and Distributed System. Very good result in terms of efficiency and speedups were achieved. MPI, OpenMP, numerical methods.

5.2 Non-academic

NPrediction I developed data mining tool for the automatic prediction of phone interview based on neural networks and cellular automata. During this project i worked in a team of two people mainly applying concept and techniques from: Data mining, Qt programming, parallel programming and neural network.