

Last updated: December 13, 2015

Borelli Marco

Curriculum Vitae

PERSONAL INFORMATION

Date and place of birth: September 10th 1988, Reggio Emilia (RE), Italy
Address: Via Dante Alighieri, 6, 42043 Gattatico (RE), Italy
Nationality: Italian
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EDUCATION AND QUALIFICATIONS

December 2015 (expected) **Master in High Performance Computing at "Abdus Salam" International Center for Theoretical Physics (ICTP) and International School of Advanced Studies (SISSA), Trieste**

Course contents: Parts I and II (8 months): courses on IT environments, scientific computing, parallel programming, numerical analysis, data management, advanced architectures and optimizations, algorithms and data structures, best practices and related tools.
Part III (7 months): thesis project.

Thesis topic: Development of a high-performance implementation of the "Density Peak" clustering algorithm. Aim of this project was to develop a parallel, efficient and linear-scaling implementation of the "Density Peak" algorithm by A. Rodriguez and A. Laio ([doi:10.1126/science.1242072](https://doi.org/10.1126/science.1242072)), that could allow the user to use a custom distance definition. The code was written in C++11 and OpenMP, with the analysis and integration of the software packages FLANN and libconfig.

Supervisor: Prof. Alessandro Laio

April 2014 **B.Sc. ("Laurea Triennale") in Physics University of Parma**

Final degree mark: 107/110

Thesis title: Conway's "Game of Life" as a paradigm for studying the portability of scientific applications to multi- and many-core architectures

Thesis abstract: This work involved the porting of a simple C code to the Nvidia Tesla and Intel Xeon Phi architectures, through the use of: MPI for inter-node and inter-device communication; OpenMP for parallelization across CPU cores and Xeon Phi cores; OpenACC to target the Nvidia Tesla GPGPU. The starting code is an implementation of Conway's "Game of Life" automaton, chosen as representative of the class of nearest-neighbours lattice simulation codes. Performance analyses were carried out on CINECA's prototype cluster "Eurora".

Supervisors: Dr. Roberto De Pietri, Dr. Roberto Alfieri

June 2007 **Scientific High School Diploma ("Maturità Scientifica") Istituto Superiore "S. D'Arzo", Montecchio Emilia (RE), Italy**

Final mark: 85/100

Achievements: European Computer Driving License (ECDL)

WORK AND TRAINING EXPERIENCE

July – August 2014 **"PRACE Summer of HPC" guest student at Jülich Supercomputing Center (JSC) / Institute for Advanced Simulation (IAS), Forschungszentrum Jülich, Germany**

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Aim of the project: **Implementing the Fast Multipole Method on GPUs with C++AMP***Abstract:* The Fast Multipole Method (FMM) is an algorithm for the numerical resolution of the N-body problem. Aim of this project was to extend an existing implementation of the FMM, written in C++ and CUDA, to run on other GPU accelerators by different vendors. To this purpose, we carried out a comparative evaluation of the various languages and language extensions available for GPGPU programming, and we eventually chose the Microsoft C++AMP technology. We then performed a partial porting of the FMM, and we demonstrated successful execution of the near-field part of the algorithm on multiple AMD S10000 devices in parallel, with minimal and fully integrated changes to the existing code.**June – July 2006 Assistant to the head of the shipping department
Interpump Group, Sant’Ilario d’Enza (RE), Italy***Economic sector:* Engineering/mechanics (hydraulic pumps).*Activities and responsibilities:* Assistance in managing shipments, contacts with couriers, and warehouse inventorying.**INFORMATION TECHNOLOGY SKILLS***Operating systems:* Practical experience with: Fedora Linux, CentOS, Ubuntu and Linux Mint; Microsoft Windows XP and Windows 7.*Programming and scripting languages:*

	knowledge level	
general-purpose	C++ C, Python	advanced good
scientific	Matlab	intermediate
web-oriented	HTML 4.01, CSS 2/3, PHP	basic

High performance computing tools: Parallel programming with MPI 2.2 and OpenMP 3.1.
GPU programming with OpenCL 1.2, OpenACC 2.0a and C++AMP; some limited experience with CUDA 6.

Use of job management systems PBS Pro and TORQUE/Maui.

Other tools: Version control with Git and Subversion.Basic website building via direct programming and with the CMS *Joomla!*.

Managing MS Access databases.

Word processing, spreadsheets, slideshows with MS Office and LibreOffice.

LaTeX typesetting.

LANGUAGES*Native language:* Italian*Second languages:* English (good); French (basic).*English level self-assessment (as per the Europass classification):*

Understanding		Speaking		Writing
Listening	Reading	Spoken interaction	Spoken production	Written production
B2 Independent	C1 proficient	B2 Independent	B2 Independent	B2 Independent

OTHER INFO*Driving license:* B license

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Marco Borelli