Romolo Marotta

Curriculum Vitæ for publishing

Personal Information

✉ *marotta@dis.uniroma1.it*

First Name Romolo

Last Name Marotta

Nationality Italian

Education

November 2016 – present **Ph.D. Student**, *Sapienza*, University of Rome, Italy, Courses held in English.
PROJECT TITLE: **Innovative Concurrent Data Structures and Synchronization Supports in Multi-core Platforms.**
ADVISOR: **Francesco Quaglia.**

January 2013 – January 2016 **Master's Degree cum laude in Engineering in Computer Science**, *Sapienza*, University of Rome, Italy, Courses held in English, GPA: 29.14/30, Mark: *110/110 cum laude*.
THESIS TITLE: **A Lock-Free O(1) Priority Queue For Pending Event Set Management.**
ADVISOR: **Francesco Quaglia.**

September 2008 – December 2012 **Bachelor's Degree in Engineering in Computer Science**, *Sapienza*, University of Rome, Italy, Taught in Italian, GPA: 26.88/30, Mark: *110/110* .
THESIS TITLE: **Input-Sensitive Profiling on I/O Flows and Multi-Threading.**
ADVISOR: **Camil Demetrescu.**

Awards and Honors

2016 **Best Paper Award**, *20th IEEE/ACM International Symposium on Distributed Simulation and Real Time Applications.* Award for the paper "A Lock-Free O(1) Event Pool and its Application to Share-Everything PDES Platforms".

Publications

2019 Romolo Marotta, Mauro Ianni, Andrea Scarselli, Alessandro Pellegrini and Francesco Quaglia, **NBBS: A Non-blocking Buddy System for Multi-core Machines**, *2019 19th IEEE/ACM International Symposium on Cluster, Cloud and Grid Computing (CCGRID), Larnaca, Cyprus, 2019*.

2018 Romolo Marotta, Mauro Ianni, Andrea Scarselli, Alessandro Pellegrini and Francesco Quaglia, **A Non-blocking Buddy System for Scalable Memory Allocation on Multi-core Machines**, *[Poster abstract] IEEE Cluster 2018, Belfast, United Kingdom, 2018*.

2018 Mauro Ianni, Romolo Marotta, Alessandro Pellegrini and Francesco Quaglia, **Optimizing simulation on shared-memory platforms: the smart cities case**, *[Invited paper] 2018 Winter Simulation Conference (WSC), WSC 2018*.

2018 Mauro Ianni, Romolo Marotta, Alessandro Pellegrini and Francesco Quaglia, **The Ultimate Share-Everything PDES System**, *2018 ACM SIGSIM Conference on Principles of Advanced Discrete Simulation, PADS 2018*.

2017 Mauro Ianni, Romolo Marotta, Alessandro Pellegrini and Francesco Quaglia, **A Non-blocking Global Virtual Time Algorithm with Logarithmic Number of Memory Operations**, *21th IEEE/ACM International Symposium on Distributed Simulation and Real Time Applications, DS-RT'17*, 2017, **(Candidate for Best Paper Award)**.

2017 Mauro Ianni, Romolo Marotta, Alessandro Pellegrini and Francesco Quaglia, **Towards a Fully Non-blocking Share-everything PDES Platform**, *21th IEEE/ACM International Symposium on Distributed Simulation and Real Time Applications, DS-RT'17*, 2017.

2017 Romolo Marotta, Mauro Ianni, Alessandro Pellegrini and Francesco Quaglia, **A Conflict-Resilient Lock-Free Calendar Queue for Scalable Share-Everything PDES Platforms**, *2017 ACM SIGSIM Conference on Principles of Advanced Discrete Simulation, PADS 2017*, 2017.

2016 Romolo Marotta, Mauro Ianni, Alessandro Pellegrini and Francesco Quaglia, **A Lock-Free O(1) Event Pool and its Application to Share-Everything PDES Platforms**, *20th IEEE/ACM International Symposium on Distributed Simulation and Real Time Applications, DS-RT'16*, 2016, **(Candidate for and winner of Best Paper Award)**.

2016 Romolo Marotta, Mauro Ianni, Alessandro Pellegrini and Francesco Quaglia, **A Non-Blocking Priority Queue for the Pending Event Set**, *9th ACM ICST Conference of Simulation Tools and Techniques, SIMUTools'16*, 2016.

2014 Emilio Coppa, Camil Demetrescu, Irene Finocchi, and Romolo Marotta. **Estimating the Empirical Cost Function of Routines with Dynamic Workloads**. *12th IEEE/ACM International Symposium on Code Generation and Optimization, CGO'14*, 2014.

Fundings and Scholarships

November 2017 **Excellent Ph.D. Student Grant**
AMOUNT:**1000€**
ORGANIZATION: Department of Computer and System Sciences Antonio Ruberti (DIAG), University of Rome "La Sapienza".

April 2017 **Research Starter Grant**
AMOUNT:**1000€**
PROJECT TITLE: **Adaptive Coordination Algorithms in Multi-core Platforms.**
PROJECT EVALUATION: Innovation of the project: 7/7; Quality and feasibility of the project: 6.5/7; CV of the proponent:3.6/6.
ORGANIZATION: University of Rome "La Sapienza".

January 2017 **ACM SIGSIM Travel Grant**
AMOUNT:**1000$**
ORGANIZATION: ACM SIGSIM

October 2016 **Ph.D. Scholarship**
ORGANIZATION: University of Rome "La Sapienza".

Reviewing Activities

March 2018 **PADS 2018** 2018 ACM SIGSIM Conference on Principles of Advanced Discrete Simulation
Artifact evaluator

March 2017 **RC 2017** 9th Conference on Reversible Computation
Subreviewer

September 2016 **NCA 2016** 15th IEEE International Symposium on Network Computing and Applications
Subreviewer

Work Experience

September 2016 – December 2017 **Researcher** *Fondazione CRUI*.
Assessment of the National Telematic Criminal Trial System.

Projects

November 2018 – present **libmutlock**, *Mutable lock library*, Open Source Software.
Libmutlock (http://github.com/HPDCS/libmutlock) provide implementations of locking primitives that combine both passive and active waiting phases. It allows to control the number of spinning threads as a means to maximize critical-section usage and reduce waste of clock cycles. The work has led to one contribution, currently under revision in the *CCPE* journal.

April 2016 – present **USE**, *Ultimate Share-Everything Simulator*, Open Source Software.
USE (http://github.com/HPDCS/USE) is a Parallel Discrete Event Simulation (PDES) engine optimized for multi-core shared-memory platforms. On the one hand, it exploits fine-grained synchronization approaches to ensure scalability in face of concurrent accesses to shared data. On the other hand, it provides non-blocking and speculative execution of simulation models by implementing a custom Time-Warp protocol optimized for shared-memory. My major contribution has been i) the design and implementation of such data structures and protocols; ii) their integration in the open source simulation environment. The work has led to three publications in the *IEEE/ACM DS-RT'17*, *ACM SIGSIM PADS'18* and *WSC'18* conferences.

December 2015 – present **NBCQ**, *Non-Blocking Calendar Queues*, Open Source Software.
NBCQ (http://github.com/HPDCS/NBCQ) is a library providing two priority queue implementations that jointly provide non-blocking synchronization and constant time access for both enqueue and dequeue operations. My major contribution has been the design and implementation of such data structures and their integration in the open source simulation environment RAMSES (http://github.com/HPDCS/RAMSES). The work has led to three publications in the *ACM/ICTS SIMUTools'16*, *IEEE/ACM DS-RT'16* and *ACM SIGSIM PADS'17* conferences.

June 2012 – February 2014 **Aprof**, *An input-sensitive performance profiler*, Open Source Software.
Aprof (https://github.com/ercoppa/aprof/wiki) is a Valgrind tool that allows developers to identify asymptotic inefficiencies hidden in the code. My major contribution has been the design and implementation of a strategy to extend the operability of Aprof to programs with multithreading and I/O from devices. The work has led to a publication in the *IEEE/ACM CGO'14* conference.

Teaching Activities

2017 – present **Teaching Assistant** (Tutoring)
Course: *Capacity Planning*.
DIAG, University of Rome "La Sapienza", Rome, Italy.

2017 – 2019 **Teaching Assistant** (4 lectures per A.Y. about *Concurrent Programming*).
Course: *Data Center and High Performance Computing*.
DIAG, University of Rome "La Sapienza", Rome, Italy.

Seminars

May 2019 *NBBS: A Non-blocking Buddy System for Multi-core Machines*.
Presentation at CCGrid'19, Larnaca, Cyprus.

October 2017 *Towards a Fully Non-blocking Share-everything PDES Platform*.
Presentation at DS-RT'17, Rome, Italy.

May 2017 *A Conflict-Resilient Lock-Free Calendar Queue for Scalable Share-Everything PDES Platforms*.
Presentation at PADS'17, Singapore.

March 2017 *An overview on solid-state-drives architectures and enterprise solutions*.
Invited talk at DIAG, University of Rome "La Sapienza", Rome, Italy.

August 2016 *A Non-Blocking Priority Queue for the Pending Event Set.*
Presentation at SIMUTools'16, Prague, Czech Republic.

Research Interests

Concurrent programming: Non-blocking algorithms, scalable concurrent data structures, self-adaptive synchronization algorithms, optimistic synchronization

Simulation: Parallel Discrete Event Simulation platforms

Research Activities

My research is mainly focused on concurrent algorithms and follows three main paths: 1) designing efficient, scalable and general purpose data structures; 2) designing synchronization protocols (e.g. spin locks and semaphores) able to adapt their behavior according to the workload (e.g. concurrency profile and access pattern); 3) implementing and integrating the abovementioned solutions in real-world HPC scenarios, in particular parallel discrete event simulation platforms.

Languages

Italian: Mother tongue.

English: Independent.

About Me

I am a determined person with a strong capability in problem solving. I always look for originality and innovation in every field I work in, starting from computer engineering to music composition. I get fit with gym activity and playing five-a-side football. I train my mind with riddles, wood brain teasers and point & click games. I like to spend my spare time building guitar effects and simple home automation projects.

Exams taken during academic courses

PH.D.		
NAME	**MARK**	**DATE**
MACHINE LEARNING	qualified	26/07/2017
SYSTEMS AND ENTERPRISE SECURITY	qualified	25/10/2017

MASTER		
NAME	**MARK**	**DATE**
CAPACITY PLANNING	30/30	06/06/2013
THEORETICAL COMPUTER SCIENCE	30 cum laude/30	24/01/2014
DATA MINING	30/30	19/02/2014
DISTRIBUTED SOFTWARE PLATFORMS	28/30	05/06/2014
COMPUTER GRAPHICS	30 cum laude/30	11/07/2014
OPERATING SYSTEMS II	30/30	17/07/2014
ARTIFICIAL INTELLIGENCE I	30/30	23/07/2014
NETWORK TRAFFIC ENGINEERING	30/30	29/07/2014
DISTRIBUTED SYSTEMS	26/30	23/09/2014
COMPUTER AND NETWORK SECURITY	30/30	04/11/2014
DATA MANAGEMENT	24/30	30/01/2015
WIRELESS NETWORK SYSTEMS	30/30	22/04/2015
SEMINARS IN ARCHITECTURES AND DISTRIBUTED SYSTEMS	qualified	01/09/2015
ELECTIVE IN ARCHITECTURES AND DISTRIBUTED SYSTEMS	30 cum laude/30	11/09/2015

BACHELOR		
NAME	**MARK**	**DATE**
ANALISI MATEMATICA I	27/30	05/02/2009
GEOMETRIA	26/30	25/02/2009
FONDAMENTI DI INFORMATICA I	30 cum laude/30	07/07/2009
ANALISI MATEMATICA II	26/30	12/02/2010
FONDAMENTI DI INFORMATICA II	28/30	10/06/2010
CALCOLATORI ELETTRONICI	25/30	23/07/2010
FISICA	30/30	16/11/2010
PROGETTAZIONE DEL SOFTWARE	30/30	25/02/2011
FONDAMENTI DI AUTOMATICA	25/30	07/03/2011
INGEGNERIA DEGLI ALGORITMI	30 cum laude/30	15/06/2011
TELECOMUNICAZIONI	25/30	21/06/2011
ELETTROTECNICA	27/30	22/07/2011
LINGUAGGI PER IL WEB	29/30	19/01/2012
BASI DI DATI	25/30	01/02/2012
RETI DI CALCOLATORI	25/30	13/02/2012
SISTEMI OPERATIVI	30 cum laude/30	16/02/2012
IDONIETÀ INGLESE	qualified	24/03/2012
CALCOLO DELLE PROBABILITÀ E STATISTICA	28/30	20/04/2012
RICERCA OPERATIVA	29/30	12/06/2012
COMPLEMENTI DI FISICA	30 cum laude/30	22/06/2012
ECONOMIA E ORGANIZZAZIONE AZIENDALE	21/30	20/09/2012
ELETTRONICA	26/30	01/10/2012