

Curriculum Vitae



Personal information:

Marco Gribaudo,

Born in **Torino (Italy)** on **27/4/1972**

Personal Identification Code: **GRBMRC72D27L219H**

Department: Dipartimento di Elettronica, Informazione e Bioingegneria,
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Current status: Associated Professor in Computer Science

sSummary

I am an Associate Professor at Politecnico di Milano. After the head of the Performance Evaluation group at Politecnico di Milano, Prof. Giuseppe Serazzi, retired in 2013, I am in charge of the “Analytical techniques and Tools for performance evaluation and optimization” activity of the System Architecture research line of the “Dipartimenti di Elettronica, Informazione e Bioingegneria” of the Politecnico di Milano.

I got my degree in Computer Science, from the University of Turin in 1997 (MS) and 2001 (Ph.D.). I have been an assistant professor (researcher) in Computer Science since 1/11/2001: first at the University of Turin from 1/11/2001 to 28/2/2010, and since 1/3/2010 until 14/7/2015 at the Politecnico di Milano. My research interests include performance evaluation and energy optimization of computing systems, cloud infrastructures, Big-Data applications and communication networks. I study such systems using advanced modeling techniques such as Markovian Agents, mean field approximations, fluid models, multi-formalism models and multi-class queuing networks. To ease my goals, I support the development of software tools to define, analyze and evaluate performance models. I also have a secondary research line in computer graphics, mainly focusing on Virtual and Augmented Reality low cost applications.

I am author of several books, journal papers and international conference papers – all indexed on the main scientific web resources. I presented 8 invited papers (including one keynote speech), 4 tutorials and won two best-paper awards. I served several scientific committees for international conferences (2 as general chair, 2 as program chair, 2 as co-chair, 1 as tool chair), reviewer for international journals such as Performance Evaluation, and Ph.D. candidates’ evaluation boards. I was the principal scientific investigator of an industrial project, worth 322k Euro. I have been in charge for 18 years of university courses on different subjects, both at the BS and at MS level. Lectures have been given both in Italian and English. I have tutored more than 200 theses, both at the BS and MS level. I have been co-advisor of three Ph.D. students, and I have been the main advisor of one Ph.D. student.

Studies

MS in Computer Science on 25/3/1997, from the University of Turin – Italy, with a score of 110/110, plus laude, honorific mention, and publication. The subject of the Thesis was “*Queuing Network with Blocking: qualitative and quantitative analysis techniques*”. The advisors were Prof. Gianfranco Balbo and Prof. Matteo Sereno (from the University of Turin) and Prof. Carla Simone (from the University of Milan).

Ph.D. in Computer Science on 15/2/2002, from the University of Turin, with the dissertation of the Ph.D. thesis: “*Hybrid formalism for performance evaluation*”. The advisors were Prof. Gianfranco Balbo and Matteo Sereno (From the University of Turin).

Research activities

On 1/11/2001, I obtained the position of Assistant Professor (Researcher) in Computer Science from the faculty of “Scienze della Formazione” (Arts and Teaching Faculty) of the University of Turin (Italy) after a public competition won in September 2001. In November 2005 the position has been confirmed, becoming a Senior Researcher.

On 1/3/2010, I moved to the Department of “Elettronica, Informazione e Bioingegneria” of the Politecnico of Milano, as an Assistant Professor (Researcher).

On 13/07/2015 I become Associate Professor the Department of “Elettronica, Informazione e Bioingegneria” of the Politecnico of Milano.

The main topics of my ongoing research activity are:

Energy optimization of computing infrastructures: study of the energy consumption of large-scale datacenters. My goal is to analyze the power consumption of the components of a single node (i.e. CPU, storage, network) under different workloads, and how they change due to the effects of virtualization and of the introduction in a cloud infrastructure. In particular I focus on the definition of workload distribution optimization techniques, and on the study of their performances using Multi-Class Queuing Networks and Petri Networks. *Results on these topics have been accepted to international conferences that are not indexed yet.*

Performance analysis of advanced computing infrastructures including Big Data applications, cloud environments and multi-core systems: application of performance evaluation techniques, ranging from multi-class queuing networks to mean field analyses, to study the performance of complex, hexa-scale systems. After performing accurate measurement on the real systems, they are used to validate the proposed models. In particular I focus on determining the optimal number of nodes in Big Data applications, defining intelligent load balancing strategies to optimize the utilization in IaaS cloud infrastructures, and I study the efficiency of multi-core processors to execute multi-threaded workloads.

Markovian Agents and Mean Field Analysis: both Markovian Agents and mean field analysis are analytical solution techniques that can be used to study systems characterized by a number of entities

that tends to the infinity. The former considers objects (agents) spread over a space that communicate using messages, while the latter considers objects that interact in way dependent on the total state of the system. Both techniques share a common mathematical foundation, and can be successfully employed to approximate systems composed by a large number of interacting objects, such as sensor networks, or for simulating the physical properties of the materials.

Tools for performance evaluation: I work on the definition of the SIMTHEsys framework for the rapid prototyping of multi-formalism models. This allows defining both the syntax and the semantics of elements that a modeler can use to describe a system. I also support the development of the Software Tool “*DrawNET*” - a framework to support the composition of performance evaluation models and formalisms. In particular, I worked on a new object oriented methodology to develop models in multi-formalism, multi-solution environment. These methodologies have been supported by the development of a generic graphical user interface (GUI), an abstract data definition language (DDL), and a set of access libraries, written in Java language, and based on XML technology.

Analysis of Computer Networks: I focus on the study of mobile telephone networks, “Peer-to-Peer” (P2P) systems, sensors and ad-hoc networks. Several analytical techniques (mainly based on fluid and hybrid performance evaluation models) have been developed and applied to various kinds of communication networks. In particular they have been used to study mobile phone networks (GPRS), the TCP/IP protocol and web services. Peer-to-Peer systems have been studied for what concern the ability to locate a particular resource, and the time required to download it. Most recent studies concern the development of spatial fluid models to optimize the energy consumption in sensor networks, and the study of efficient broadcast protocols in vehicular networks.

Fluid and Hybrid Performance Evaluation Models: study of numerical and analytical techniques to evaluate the performance of complex systems, using performance models described by mixed continuous and discrete components. In particular, I started by extending the formalism of the Fluid Stochastic Petri Nets introduced by Trivedi and Kulkarni, adding new features and studying new solution techniques to compute both transient and steady state performance indices. Other investigations considered the efficient solution of Hybrid Bounded Fluid Models of the first and second order.

Virtual and Augmented Reality: study of low-cost solutions to visualize and enhance vision of 3D generated images, with complex human interaction patterns. Applications have been investigated in advanced training, rescue operations, fashion industry, and minimal invasive surgery.

Topics of my past research activity, that are currently only partially investigated, include:

Queuing network with blocking: study of solution technique for finite capacity queuing systems. In particular I developed special solution algorithms based on the translation of a queuing network with blocking into a Generalized Stochastic Petri Nets

E-learning: study and development of a platform to create virtual reality based, e-learning shared applications based on low-cost technologies. In particular, simple and common web technologies (like Javascript and PHP) have been integrated with Virtual Reality applications (such as Adobe Atmosphere in the beginning then Unreal Technology), to recreate a Virtual Reality environment in which implement cooperative exercise to support the other common learning activities. Particular interest has

been focused in Edutainment and serious gaming.

Performance evaluation of Multimedia systems: applications to the study of multimedia production systems, focusing on cinema and television productions. Analysis of the integrated content development systems, taking into account economical factors, and using classical performance evaluation techniques such as Petri Nets and probabilistic models

National and International cooperation:

I have visited several universities and I have been involved in many international cooperation. The most important are: the **Technical University of Budapest** (*Hungary*), the Department of Robotics of the **Technical University of Berlin** (*Germany*), the **University “Federico Secondo”** in **Naples** (*Italy*), the Laboratory for Foundations of Computer Science of the **University of Edinburgh**, the **Arizona State University** (Tempe – Az, USA), and the **University of Twente** (Enschede, The Netherlands). I have also given a seminar on optimization of computing infrastructure at **CERN** (Geneve, Switzerland). In October 2017 and May 2018 I have visited the People Friendship University of Moscow, where I gave three courses: “Performance Modelling with Queuing Networks” (10 hours) and “Fundamental Laws of Dependability” (10 hours), “Modelling with Mean Field and Markovian Agents Techniques” (10 hours).

Projects and grants:

I have coordinated the following projects:

Industrial project with the Consultant, Systems Integration e Application Management Company **Reply S.P.A.** In this project, I was the coordinator and the principal investigator. The budget of the project was 322K Euro, with which I was able to support 6 post-doc positions during three years, and several other research associates to create high-performance open-source multi-platform game development libraries.

Project “DrawNET”, a self-funded and coordinated research project, for the creation of a tool for the design and solution of models of complex systems. That project took advantage of several resources funded from other research projects that used the tool (PRIN, DePauDe, Crutial)

I took part to the following projects:

EU-Brasil BigSea project - working on fluid models of parallel computation paradigms, and supporting a P.h.D. of my group.

Antarex EU Project - working on fluid models of HPC systems, and supporting a P.h.D. of my group.

Italian project “WiSe DeMon : Affidabilità e qualità del servizio in sistemi di monitoraggio basati su *Wireless Sensor Networks per applicazioni critiche*” (Reliability and service quality in critical application monitoring systems based on Wireless Sensor Networks), Italian ministry **PRIN**, years 2007-2008.

Italian Project ENEA-DI “*Metodi, strumenti e modelli probabilistici per l'analisi della dependability e della survivability di sistemi digitali basati su reti di telecomunicazione*” (Methods, tools and probabilistic models for the survivability and dependability analysis of communication network based digital systems), year 2004.

Italian project "*Performance Evaluation of Complex Systems: Techniques, Methodologies and Tools (Perf)*", from **MIUR-FIRB**, years 2002-2005.

Italian project "*Planet-IP (Planning IP networks)*", from the Italian ministry **MURST**, years 2001-2002.

Italian project ENEA-DISTA “*Modelli e strumenti per l'analisi di affidabilità, sicurezza di funzionamento e prestazioni di sistemi elettronici programmabili complessi ad alta criticità con particolare riferimento al sistema di controllo della turbina a gas dell'impianto di cogenerazione ICARO*” (Models and tools for the reliability, operational safety, and performance analysis of complex critical system, focusing on the gas turbine ICARO), years 2000-2001

Committees:

Two committees for the selection of a candidate applying to an assistant professor positions at the University of Catania.

Eleven PhD national defense committees at the University of Torino, Politecnico of Torino, University of Bologna, University of Messina, University of Venezia.

Three international Ph.D. committee at the **Imperial College** – London, UK, at **UTC - Compigne University of Technology**, Sorbonne Universities, France, and at **University of Twente**, Enschede, The Netherlands.

Chair positions in international conferences

I have been **program chair** of *European Conference on Modelling and Simulation* (ECMS 2019), June 11th-14th, 2019. Caserta, Italy.

I have organized *InfQ 2018*, the main meeting event for the Performance Evaluation community in Italy, in November 23rd, 2018, in the facilities of Politecnico di Milano.

I have been **technical program chair** of the *9th EAI International Conference on Performance Evaluation Methodologies and Tools* (ValueTools 2015). December 14–16, 2015. Berlin, Germany

I have been **general chair** of *International Conference on Analytical and Stochastic Modelling Techniques and Applications* (ASMTA 2015), that took place in Varna, Bulgaria on May 26th-29th, 2015 (co-located with ECMS 2015 – European Conference on Modelling and Simulation).

I have been **co-chair** of the first two editions of the *Workshop on Research and Use of Multiformalism Modeling Methods* (WRUMMM). The first edition was co-located with QEST 2012 (International Conference on Quantitative Evaluation of SysTems), September 17-20, 2012 – London, UK. The second edition was co-located with ECMS 2014 (European Conference on Modelling and Simulation), May 27-30, Brescia, Italy.

I had the **tool chair** position on the *Sixth International Conference on Quantitative Evaluation of SysTems* (QEST), which took place in Budapest, Hungary, on September 13th-16th, 2009.

Program Committees in international conferences

Queuing Theory with Network Applications (QTNA)

- 2019: August 27-29, Ghent, Belgium

International Conference on Analytical and Stochastic Modelling Techniques and Applications (ASMTA)

- 2019: October 21-25, Moskow, Russia
- 2017: June 10-12, Newcastle upon Tyne, UK
- 2016: August 24-26, Cardiff, UK
- 2014: June 30-July 2, Budapest, Hungary
- 2013: July 8-10, Ghent, Belgium
- 2012: June 4-6, Grenoble, France
- 2011: June 20-22, Venice, Italy
- 2010: June 14-16, Cardiff, UK
- 2009: June 9-12, Madrid, Spain
- 2008: June 4-6, Nicosia, Cyprus.

International Conference on Performance Evaluation Methodologies and Tools (ValueTools)

- 2019: March 13-15, Palma, Spain
- 2017: December 5-7, Venice, Italy
- 2016: October 25-28, Taormina, Italy
- 2014: December, 9-11, Bratislava, Slovakia
- 2013: December, 10-12, Torino, Italy
- 2011: May 16-20, Cachan, France
- 2009: October 20-22, Pisa, Italy
- 2008: October 20-24, Athens, Greece.

International Workshop on Practical Applications of Stochastic Modelling (PASM)

- 2017: September 9, Berlin, Germany
- 2016: April 5, Munster, Germany
- 2014: May 13, Newcastle, UK
- 2013: September 17, London, UK
- 2011: March 17, Karlsruhe, Germany
- 2009: September 24, London, UK
- 2008: September 23, Palma de Mallorca, Spain

International Conference on Simulation Tools and Techniques (SimuTools)

- 2014: March 17-19, Lisbon, Portugal
- 2013: March 5-6, Cannes, France
- 2012: March 19-23, Desenzano, Italy

- 2011: March 21-25, Barcelona, Spain

International Conference on High Performance Computing and Communications

- 2014: August 20-22, Paris, France

International Symposium on Modelling, Analysis and Simulation of Computer and Telecommunication Systems (MASCOTS)

- 2012: August 7-9, Washington
- 2011: July 25-27, Singapore
- 2010: August 17-19, Miami (FL), USA
- 2009: September 21-23, London UK

European Performance Engineering Workshop (EPEW)

- 2011: October 12-13, Borrowdale, UK
- 2009: July 9-10, London, UK

Dependable Control of Discrete System (DCDS)

- 2011: June 15-18, Saarbrücken, Germany
- 2009: June 10-12, Bari, Italy

International Workshop on Ambient Intelligence, Media, and Sensing (AIMS)

- 2007: April 20th, 2007, Istanbul, Turkey

Invited Papers and Keynote speeches

2/8/2016: M. Gribaudo, “Markovian Agents and Mean-Field modeling of modern datacenter infrastructures and workloads”, CERN, (Geneve, Switzerland)

14/12/2014: M. Gribaudo, “Discrete Time Markovian Agents” Dagstuhl seminar on “Collective Adaptive Systems: Qualitative and Quantitative Modelling and Analysis” (Dagstuhl, Germany)

16/1/2014: M. Gribaudo, M. Iacono, “Multiformalism to support software rejuvenation modeling” Dagstuhl seminar on “Randomized Timed and Hybrid Models for Critical Infrastructures” (Dagstuhl, Germany)

8/3/2010: M. Gribaudo, “Mean field analysis” ROCKS meeting, Nijmegen, The Netherlands.

10/7/2009: M. Gribaudo, “*Analysis of Large Systems with Mean Field and Markovian Agents*”. Presented to *European Performance Evaluation Workshop (EPEW 09)*, London, UK.

Keynote speech.

4/9/2005: M. Gribaudo, “*The Technology Used in the "European DISTance TRaining Interactive and Collaborative Tools for the Civil Protection" (e-DISTRICT CiPro), Leonardo da Vinci European Project*”. Presented to *Third Medical Emergency Medicine Congress (MEMC3)*, Nice, France.

20/1/2004: R. Gaeta, M. Gribaudo, D. Manini, M. Sereno, “*An analytical modelling technique for computing transfer time distributions in peer-to-peer networks*”. Presented to the “*Workshop Interno*”

Progetto FIRB (Tango)”, Madonna di Campiglio, Italy.

20/12/2001: M. Ajmone Marsan, M. Gribaudo, M. Meo, and M. Sereno. “*Performance Analysis of Data Services over GPRS*”. Presented to *International Conference On High Performance Computing*, Hyderabad, India.

Awards

Best paper award: M. Gribaudo, M. Iacono, D. Manini, “*Performance Evaluation Of Massively Distributed Microservices Based Applications*”. European Conference on Modelling and Simulation (ECMS 2017). *Presented, Budapest, Hungary, May 24th, 2017.*

Best paper award: D. Manini, M. Gribaudo, “*Modelling Search, Availability, and Parallel Download in P2P File Sharing Applications with Fluid Model*”. *14th International Conference on Advanced Computing and Communication ADCOM 2006, Mangalor, India, December 20th, 2001.*

On 24/11/1997, my MS thesis has been awarded with a medal as the “best thesis of the year 1996/1997”.

Tutorials in international conferences

10/4/2018: M. Gribaudo, “*Modelling with Markovian Agents*”, in International Conference on Performance Engineering (ICPE 2018), Berlin, Germany, April 10, 2018.

10/12/2013: D. Cerotti, M. Gribaudo, P. Piazzolla and G. Serazzi, “*Performance optimization with JMT: Java Modelling Tools*”, in Quantitative Evaluation of Systems (ValueTOOLS 2013), Turin, Italy, December 10, 2013. *See [Error! Reference source not found.]*.

17/9/2012: A. Bobbio, D. Cerotti and M. Gribaudo, “*Markovian Agents models*”, in Quantitative Evaluation of Systems (QEST 2012), London, UK, September 17, 2012.

19/9/2005: M. Gribaudo and M. Telek, “*Fluid Models in Performance Analysis*”, in Quantitative Evaluation of Systems (QEST 2005), Turin, Italy, September 19, 2005.

Conference Talks

I have given the following talks in these international and national venues:

11-14/6/2019: European Conference on Modelling and Simulation (ECMS 2019), Caserta, Italy. *Presented "Reducing sickness and enhancing virtual reality simulation on mobile devices by tracking the body rotation.*

25-26/4/2019: Computer Vision Conference (CVC 2019), Las Vegas, NV, Usa. Presented "*Non-linear-Optimization Using SQP for 3D Deformable Prostate Model Pose Estimation in Minimally Invasive Surgery*".

23-25/7/2018: Queueing Theory with Network Applications (QTNA 2018), Tsukuba, Japan. Presented "*Modelling large timescale and small timescale service variability*".

22-25/5/2018: European Conference on Modelling and Simulation (ECMS 2018), Whitleshaven, Germany. Presented "*Anchor placement in indoor object tracking systems for virtual reality simulations*".

11-13/4/2018: (ICPE 2018), Berlin, Germany. Presented "*Performance Prediction of Cloud-Based Big Data Application*".

5-7/12/2017: International Conference on Performance Evaluation Methodologies and Tools (ValueTools 2018), Venice, Italy. Presented "*Scalable analytical model of the reliability of multicore systems-on-chip by interacting Markovian agents*" and "*Modeling and evaluating performances of complex edge computing based systems: a firefighting support system case study*".

9/9/2017: International Workshop on Practical Applications of Stochastic Modelling (PASM 2018), Berlin, Germany. Presented "*Epistemic Uncertainty Propagation in Power Models*" and "*Performance evaluation of replication policies in microservice based architectures*".

10-12/7/2017: International Conference on Analytical and Stochastic Modelling Techniques and Applications (ASMTA 2017), Newcastle-upon-Tyne, UK. "*Modeling multiclass task-based applications on heterogeneous distributed environments*".

23-26/6/2017: European Conference on Modelling and Simulation (ECMS 2017), Budapest, Hungary. Presented "*A low-cost distributed iot-based augmented reality interactive simulator for team training*" and "*Performance evaluation of massively distributed microservices based applications*".

16-19/5/2017 - International Workshop on Energy-Efficient Data Centres (ED2C 2017) and ACM eEnergy 2017, Hong Kong. Presented "*Improving energy efficiency for transactional workloads in cloud environments*".

24-26/8/2016: International Conference on Analytical and Stochastic Modelling Techniques and Applications (ASMTA 2016), Cardiff, UK. "*Fluid approximation of pool depletion systems*".

31/5-3/6/2016: European Conference on Modelling and Simulation (ECMS 2016), Regensburg, Germany. Presented "*Three layers network influence on cloud data center performances*" and "*vMannequin: A fashion store concept design tool*".

4-5/4/2016: International Workshop on Practical Applications of Stochastic Modelling (PASM 2016) and Conference on Measurement, Modeling, and Evaluation of Computer and Communication Systems (MMB 2016), Munster, Germany. Presented "*Stochastic analysis of energy consumption in pool depletion systems*".

9-10/12/2015: Conference of the Italian Chapter of AIS (ITAIS 2015). *Presented "Power consumption analysis of replicated virtual applications in heterogeneous architectures" and "Modeling replication and erasure coding in large scale distributed storage systems based on CEPH"*.

22-24/9/2015: Information Sciences and Systems (ISCIS 2015), London, UK. *Presented "Modeling Power Consumption in Multicore CPUs with Multithreading and Frequency Scaling"*.

25-30/5/2015: International Conference on Analytical and Stochastic Modelling Techniques and Applications (ASMTA 2015) and European Conference on Modelling and Simulation (ECMS 2015), Albena (Varna), Bulgaria. *Presented "A simulation based approach for the evaluation of outcome driven innovation models"*.

20-22/8/2014: European Conference on Queuing Theory (ECQT 2014), Ghent, Belgium. *Presented "Energy consumption in systems with multi-class workloads"*.

30/6-2/7/2014: International Conference on Analytical and Stochastic Modelling Techniques and Applications (ASMTA 2014), Budapest, Hungary. *Presented "Throughput maximization with multiclass workloads and resource constraints" and "Markovian agents population models to study cancer evolution"*.

27-30/5/2014: European Conference on Modelling and Simulation (ECMS 2014), Brescia, Italy. *Presented "Workload characterization of multithreaded applications on multicore architectures"*.

10-12/12/2013: International Conference on Performance Evaluation Methodologies and Tools (ValueTools 2013), Torino, Italy. *Presented "Modeling apache hive based applications in big data architectures" and "Performance optimization with JMT: Java modelling tools"*.

16-17/9/2013: European Performance Engineering Workshop (EPEW 2013), Venezia, Italy. *Presented "End-to-end performance of multi-core systems in cloud environments"*.

8-10/7/2013: International Conference on Analytical and Stochastic Modelling Techniques and Applications (ASMTA 2013), Gent, Belgium. *Presented "Studying mobile internet technologies with agent based mean-field models"*.

27-30/5/2013: European Conference on Modelling and Simulation (ECMS 2013), Alesund, Norway. *Presented "A performance modeling language for big data architectures"*.

17-20/9/2012: Quantitative Evaluation of Systems (QEST12), London, UK. *Presented "Flexible CPU provisioning in clouds: A new source of performance unpredictability"*.

4-6/6/2012: International Conference on Analytical and Stochastic Modelling Techniques and Applications (ASMTA 2012), Grenoble, France. *Presented "Consolidation and replication of VMs matching performance objectives"*.

12-13/10/2011: European Performance Engineering Workshop (EPEW 2011), Borrowdale, UK. *Presented "A tool suite for modelling spatial interdependencies of distributed systems with Markovian agents"*.

20-22/6/2011: International Conference on Analytical and Stochastic Modelling Techniques and Applications (ASMTA 2011), Venice, Italy. *Presented "Performability modeling of exceptions-aware systems in multiformalism tools"*.

17-19/8/2010: International Symposium on Modeling, Analysis and Simulation of Computer and Telecommunication Systems (MASCOTS 2010), Miami, FL (USA). *Presented "Element based semantics in multi formalism performance models"*.

14-16/6/2010: International Conference on Analytical and Stochastic Modelling Techniques and Applications (ASMTA 2010), Cardiff, UK. *Presented "Performance evaluation of media segmentation heuristics using non-markovian multi-class arrival processes"*.

9-12/6/2009: International Conference on Analytical and Stochastic Modelling Techniques and Applications (ASMTA 2009) and European Conference on Modelling and Simulation (ECMS 2009), Madrid, Spain. *Presented "Stochastic modelling of poll based multimedia productions"*.

23-27/3/2009: European joint conferences on Theory And Practice of Software (ETAPS2009), York, UK. *Presented "ITPN-Perfbound: A performance bound tool for interval time petri nets"*.

23-25/9/2008: International Workshop on Practical Applications of Stochastic Modelling (PASM 2008) and European Performance Engineering Workshop (EPEW 2008), Palma de Mallorca, Spain. *Presented "Performance Analysis of the ARIA Adaptive Media Processing Workflows using Colored Petri Nets"*.

4-6/6/2008: International Conference on Analytical and Stochastic Modelling Techniques and Applications (ASMTA 2008) and European Conference on Modelling and Simulation (ECMS 2008), Nicosia, Cyprus. *Presented "An analytical study of the resource diffusion in non-homogeneous P2P networks"*.

17-21/3/2008: IEEE International Workshop on Sensor Networks and Systems for Pervasive Computing (PerSeNS 2008), Kowloon, Hong Kong. *Presented "Analysis of on-off policies in sensor networks using interacting Markovian Agents"*.

11-14/9/2006 Quantitative Evaluation of Systems (QEST06), Riverside (CA), USA. *Presented "Performance analysis of Delay Tolerant Networks with model checking techniques"*.

27-29/3/2006: Conference on Measurement, Modeling, and Evaluation of Computer and Communication Systems (MMB 2006), Nurnberg, Germania. *Presented "Fixed-point approximations for TCP behavior in networks of routers implementing heterogeneous queue management policies"*.

28/6-1/7/2005: International Conference on Dependable Systems and Networks (DSN2005), Yokohama, Japan. *Presented "A spatial fluid-based framework to analyze large-scale wireless sensor networks"*.

24–26/6/2004: International Conference on Dependable Systems and Networks (DSN2004), Florence, Italy. *Presented "An efficient algorithm for the transient analysis of a class of deterministic stochastic petri nets"*.

2–5/9/2001: International Workshop on Petri Nets and Perform Models 2003, PNPM'03, Urbana, IL, USA, and Sixth International Workshop on Performability Modeling of Computer and Communication Systems (PMCCS 5), Monticello, IL, USA. *Presented "Stationary analysis of FSPNs with mutually dependent discrete and continuous parts"*.

24–26/6/2002: International Conference on Dependable Systems and Networks (DSN2002), Washington, DC, USA. *Presented "DrawNet++: A flexible framework for building dependability models"*.

21–23/4/2002: International Conference on Modelling Tools and Techniques for Computer and Communication System Performance Evaluation, London, UK. *Presented "DrawNET++: Model objects to support performance analysis and simulation of systems"*.

11–16/9/2001: International Workshop on Petri Nets and Perform Models 2001, PNPM'01, Aachen, Germany, and Fifth International Workshop on Performability Modeling of Computer and Communication Systems (PMCCS 5), Erlangen, Germany. *Presented "Numerical Analysis of Bounded Fluid Models using Matrix Exponentiation"*.

25–28/6/2001: International Conference on Parallel and Distributed Processing Techniques and Applications (PDPTA'01), Las Vegas, NE, (USA). *Presented "A multiparadigm simulation framework"*.

29/8-1/9/2000: International Symposium on Modeling, Analysis and Simulation of Computer and Telecommunication Systems (MASCOTS 2000), San Francisco, Ca (USA). *Presented "Simulation of Fluid Stochastic Petri Nets"*.

6–10/9/1999: Multi-Workshop on Formal Methods in Performance Evaluation and Application, Saragoza, Spain. *Presented "Modeling software systems with rejuvenation, restoration and checkpointing through fluid stochastic Petri nets" and "Fluid stochastic Petri nets: An extended formalism to include non-Markovian models"*.

Citations:

1288 citations, H-index = 21 and 149 works indexed on Scopus, as July 2nd, 2019

Publications:

I am author of 44 international journal publications, 109 international conference publications, 5 book chapters or editorials, and 2 books. Most of my works are indexed on Scopus, Web Of Science and/or DBLP, and they can be downloaded from *IEEEExplore*, *ACM digital library*, *SpringerLink*, *Science Direct* or other reputable on-line repositories.

My current list of publications is included in a separate document.

Editorial board

I am part of the Editorial Board of the JOURNAL OF HIGH SPEED NETWORKS [1992-] 0926-6801, from January 2018.

Teaching Activities

University Courses

I have been the main lecturer in Introductory Computer Science, Computer Graphics, and Performance Evaluation. The following table summarizes my teaching activity at the University level.

Year	Course (Ita.)	Course (Eng.)	Level	Hours	Students
2018-2019	<i>[Course given in English]</i>	Computer Systems Performance Evaluation	MS	50	~75
2018-2019	<i>[Course given in English]</i>	Performance Evaluation of Computer Systems	MS	50	~35
2018-2019	<i>Tecniche della rappresentazione</i>	Representation techniques (for the fashion industry)	BS	40	~45
2018-2019	<i>[Course given in English]</i>	Digital Interactive Technologies for Physical Interfaces	MS	30	~50
2018-2019	<i>[Course given in English]</i>	Computer Graphics	MS	50	~200
2017-2018	<i>[Course given in English]</i>	Computer Systems Performance Evaluation	MS	50	~75
2017-2018	<i>[Course given in English]</i>	Performance Evaluation of Computer Systems	MS	50	~35
2017-2018	<i>Tecniche della rappresentazione</i>	Representation techniques (for the fashion industry)	BS	40	~45
2017-2018	<i>[Course given in English]</i>	Computer Graphics	MS	50	~240
2016-2017	<i>[Course given in English]</i>	Performance Evaluation of Computer Systems	MS	50	~15
2016-2017	<i>[Course given in English]</i>	Computing Infrastructures	MS	50	~180
2016-2017	<i>[Course given in English]</i>	Computer Graphics	MS	50	~80
2015-2016	<i>[Course given in English]</i>	Performance Evaluation of Computer Systems	MS	50	~75
2015-2016	<i>[Course given in English]</i>	Computing Infrastructures	MS	50	~180
2015-2016	<i>[Course given in English]</i>	Computer Graphics	MS	50	~80
2014-2015	<i>[Course given in English]</i>	Performance Evaluation of Computer Systems	MS	50	~75
2014-2015	<i>[Course given in English]</i>	Computing Infrastructures	MS	50	~180
2014-2015	<i>[Course given in English]</i>	Computer Graphics	MS	50	~80
2013-2014	<i>[Course given in English]</i>	Enterprise Digital Infrastructures	MS	50	~180
2013-2014	<i>[Course given in English]</i>	Computer Graphics	MS	50	~80
2012-2013	<i>[Course given in English]</i>	Computer Systems	BS	50	~25
2012-2013	<i>[Course given in English]</i>	Computer Graphics	MS	50	~80
2011-2012	Informatica (Civ)	Basic Compute Science	BS	117	~120
2011-2012	<i>[Course given in English]</i>	Computer Systems	BS	50	~25
2011-2012	<i>[Course given in English]</i>	Computer Graphics	MS	50	~80
2010-2011	Informatica (Civ)	Basic Compute Science	BS	117	~120
2010-2011	<i>[Course given in English]</i>	Computer Systems	BS	50	~25
2009-2010	Informatica Grafica per le arti	Computer Graphics for Arts	BS	54	~150
2009-2010	Informatica + Laboratorio	Basic Computer Science	BS	24	~45
2009-2010	Sistemi Multimediali	Multimedia Systems	MS	48	~25
2008-2009	Informatica Grafica per le arti	Computer Graphics for Arts	BS	60	~150
2008-2009	Informatica + Laboratorio	Basic Computer Science	BS	24	~45
2007-2008	Informatica Grafica per le arti	Computer Graphics for Arts	BS	60	~150

2006-2007	Informatica Grafica per le arti	Computer Graphics for Arts	BS	60	~150
2005-2006	Informatica Grafica	Computer Graphics	BS	60	~150
2005-2006	Informatica Grafica II	Intermediate Computer Graphics	MS	60	~25
2005-2005	Informatica + Laboratorio	Basic Computer Science	BS	24	~45
2004-2005	Informatica Grafica	Computer Graphics	BS	60	~150
2004-2005	Informatica Grafica II	Intermediate Computer Graphics	MS	60	~25
2003-2004	Informatica Grafica	Computer Graphics	BS	60	~150
2003-2004	Informatica + Laboratorio	Basic Computer Science	BS	24	~45
2002-2003	Informatica Grafica	Computer Graphics	BS	60	~150
2002-2003	Informatica + Laboratorio	Basic Computer Science	BS	24	~45
2001-2002	Informatica Grafica	Computer Graphics	BS	60	~150
2001-2002	Informatica + Laboratorio	Basic Computer Science	BS	24	~45

Thesis

I have followed more than 200 students, between bachelor and master degree.

P.h.D students

I have been co-advisor for three PhD students: Davide Cerotti (2007-2010), Pietro Piazzolla (2007-2010) and Enrico Barbierato (2010-2013). The all have been post-docs at the Politecnico of Milano in my group. Currently Davide Cerotti is a Junior Researcher (RTD-A) at the “Università del Piemonte Orientale – Vercelli”, Pietro Piazzolla is a Junior Researcher (RTD-A) at the “Politecnico di Torino” and Enrico Barbierato is a Junior Researcher (RTD-A) at the “Università Cattolica del Sacro Cuore – Brescia”. I have been the main advisor of Riccardo Pincioli, PhD student at the Politecnico of Milano. Riccardo Pincioli is now a Research Fellow at the “William and Mary’s College” in Williamsburg, VA, USA.

I am Member of the scientific program board of the international P.h.D. in “Cyber Physical Systems”, cycle 33 and 34, years 2017-2018 and 2018-2019 for the University of Messina (Italy).

Advanced professional courses

I have given more than twenty courses in various professional courses on the following topics: Web programming, computer graphics and animation, Cloud Computing, Enterprise Computing Infrastructure, Performance Evaluation and Dependability.

Technical knowledge

Programming languages:

General Purpose Languages: *C, C++, Java, Basic (Visual Basic), Ada, Lisp, Assembler, Pascal, Fortran*. Web Languages: *PHP, Javascript*. Multimedia Languages: *Actionscript, Ling*. 3D Graphics Languages: *MEL, HLSL, Cg, GLSL*. Mathematical Languages: *Mathematica, Matlab, Octave*

Technologies and Data Bases:

Web Technologies: *HTML, XML, SVG, VRML, X3D, Collada*. Database: *SQL, MySQL, Access*. Rendering Engines and Virtual Reality Technologies: *Open GL, Microsoft DirectX, Torque, Unreal. Technology, Ogre, Adobe Atmosphere, ViewPoint, Balxun, Mental Ray, JME*. BigData technologies:

Hadoop, Hive, Cassandra, Mongo DB, H-Base. Virtualization and Cloud technologies: OpenStack, VirtualBox, VMware

Operating Systems:

Microsoft Windows, Linux, Solaris, MacOS. Advanced knowledge on administration of networks, firewalls and on configuration and integration of services.

Applications

Office Automation: *Microsoft Office, LaTeX.* 2D Graphics: *Corel Draw, Adobe Flash, Adobe PhotoShop, Jasc Paint Shop Pro, GIMP, Tgif, Xfig.* 3D Graphics: *Maya, 3D Studio, Lightwave, Blender, Bryce, Poser, Motion Builder.* Compositing and Video Editing: *Discreet Combustion, Adobe Premiere, Adobe After Effect.* Multimedia and Web production: *Macromedia Director, Macromedia Dreamweaver.* Digital Audio: *Sony Sound Forge, Steinberg Cubase*

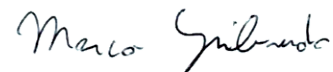
Advanced 3D Graphics Knowledge: *Vicon Motion Capture* technology and the *IQ* data acquisition software

Hardware Technical Skills

Assembly and expansion of Personal Computers. Installation and configuration of Computer Networks. Programming of micro-controllers and Arduino experiences. Programming FPGAs in Verilog. Tracking experience using inertial measurement units and indoor ultra-wide-band positioning systems.

Milano,
July 2nd, 2019

Marco Gribaudo.



Informativa ai sensi dell'art. 13 del D.Lgs 196/2003:

i dati sopra riportati sono prescritti dalle disposizioni vigenti ai fini del procedimento per il quale sono richiesti e verranno utilizzati esclusivamente per tale scopo.