Marco D. Santambrogio
Curriculum Vitae et studiorum

Personal and Contact Information

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Date of Birth: November 4, 1977

Brief description

Marco D. Santambrogio is assistant professor at the Politecnico di Milano. He is also holding a research affiliate position at Massachusetts Institute of Technology and an adjunct professor position in the College of Engineering of University of Illinois at Chicago. He received his laurea (M.Sc. equivalent) degree in Computer Engineering from the Politecnico di Milano in 2004, his second M. Sc. degree in Computer Science from the University of Illinois at Chicago (UIC) in 2005 and his PhD degree in Computer Engineering from the Politecnico di Milano in 2008. Dr Santambrogio was a Postdoc Fellow at the Computer Science and Artificial Intelligence Laboratory at Massachusetts Institute of Technology in 2009. He has also held visiting positions at the EECS Department of the Northwestern University (2006 and 2007) and Heinz Nixdorf Institut (2006 and 2009). He has been with the Micro Architectures Laboratory at the Politecnico di Milano, where he founded the Dynamic Reconfigurability in Embedded System Design (DRESD) project in 2004. He conducts research and teaches in the areas of reconfigurable computing, hardware/software codesign, embedded systems, and high performance processors and systems. He is involved in teaching activities in Dipartimento di Elettronica e Informazione, Politecnico di Milano, since 2004, in Università degli Studi di Milano, since 2005, and in ALaRI - Advanced Learning and Research Institute, University of Lugano, since 2005.

Marco D. Santambrogio is a member of the ACM, the IEEE, the IEEE Computer Society and Circuits and Systems Society. He is guest editing a special issue for the EURASIP Journal of Embedded Systems and for the Journal of Systems Architecture, Elsevier. He has been a reviewer for IEEE Transactions on Very Large Scale Integration Systems (TVLSI), IEEE Transaction on Computer-Aided Design (TCAD), IEEE Transaction on Computer (TOC), IEEE Embedded Systems Letters (ESL), ACM Transactions on Embedded Computing Systems (TECS), ACM Transaction on Reconfigurable Technology and Systems (TRETS), Journal of Systems Architecture (JSA), International Journal of Circuit Theory and Applications (IJCTA) and different international conferences and he has been in the program committee of several international conferences. He served as session organizer and chair for RAW, SPL, ERSA and IEEE International Symposium on Circuits and Systems (ISCAS). Since 2001, he has been involved in several research projects in collaboration with industries such as ATMEL, Siemens Mobile and Nokia Siemens Network.

Awards

- **Best paper award**: 15th International Conference on Very Large Scale Integration, IFIP VLSI-SoC 2007 (Paper title: *ReCPU: a Parallel and Pipelined Architecture for Regular Expression Matching*).

- **Dimitri N. Chorafas PhD Thesis Award** from the Chorafas Foundation (Berne, Switzerland)for the best PhD Theses in *Systems Engineering and Information Technology*, May 2008.
  Thesis title: *Hardware/Software codesign methodologies for dynamically reconfigurable systems*.

- December 2008. He has been awarded a **Progetto Rocca Postdoc Fellowship at MIT**.

- Co-author of the Best Paper Award Finalist, IEEE International Conference on Field Programmable Logic and Applications (FPL) 2009

- Co-author of the **Best Student Paper award sponsored by IEEE TCPP**: 7th IEEE International Conference on Autonomic Computing (ICAC) 2010 (*Smartlocks: Lock Acquisition Scheduling for Self-Aware Synchronization*)

Education

- **PhD in Information Engineering** — Italy
  Politecnico di Milano — *Jan 2005 - Feb 2008*
  - Thesis: "Hardware/Software codesign methodologies for dynamically reconfigurable systems" Advisor: Prof. D. Sciuto

- **Qualifier exam to practice the profession of engineering** — Italy
  Politecnico di Milano — *Sep 2008*

- **M. Sc. in Computer Science** — United States
  Univesity of Illinois at Chicago — *Jan 2002 - Jun 2004*
  - Thesis: "Dynamic Reconfigurability in Embedded System Design. A Model for the Dynamic Reconfiguration" Advisor: Prof. John Lillis

- **Laurea (equivalent to M. Sc.) in Computer Engineering** — Italy
  Politecnico di Milano — *Sep 1996 - Apr 2004*
  - Thesis: "Dynamic Reconfigurability in Embedded System Design. A Model for the Dynamic Reconfiguration" Advisor: Prof. D. Sciuto

Academic Career

- **Assistant Professor** — Italy
  Politecnico di Milano — *November 2009 - present*

- **Research Affiliate** — USA
  Massachusetts Institute of Technology — *March 2010 - present*

- **Adjunct Professor** — USA
  University of Illinois at Chicago — *January 2010 - present*

- **Postdoc Fellow** — USA
  Massachusetts Institute of Technology — *Feb 2009 - Feb 2010*

- **Research Assistant** — Italy
  Politecnico di Milano — *May 2008 - October 2009*

- **Research Assistant** — Italy
  Politecnico di Milano — *Apr 2004 - Mar 2005*

- **Invited Researcher** — United States
  Northwestern University — *Spring Semester 2006 and 2007*

- **Invited Researcher** — Germany
  Heinz Nixdorf Institut — *Jan 2006 and Jan 2009*

- **Teaching Assistant** — Italy
  Politecnico di Milano — *2001 - present*

- **Teaching Assistant** — Switzerland
  Advanced Learning and Research Institute — *2004 - 2008*

- **Teaching Assistant** — Italy
  Università degli Studi di Milano — *2005 - present*

- **Theses**
  2004 - present

– Co-advised:
   Undergraduate Degree (Politecnico di Milano) $\geq$ 100;
   Graduate degree (Politecnico di Milano): $\geq$ 20;
   Graduate degree (UIC): $\geq$ 10
– Advised:
   Graduate degree (UIC) $\geq$ 9;
   Undergraduate degree (Politecnico di Milano): $\geq$ 17

Research

- Self-adaptable and autonomic systems. A self-adaptive and autonomic computing system is a system able to configure, heal, optimize and protect itself without the need for human intervention. Therefore, aim of this research is to develop performance models and prototypes of software and hardware components required to support the operating system and enable the same application to achieve its goals while working on different systems.

- Research && Education: how to create a win-win game where research and the students experience are positively inSSuenced one other.

- Methodologies for dynamic reconfiguration in embedded system. Aim of this research is the definition of methodologies and tools for implementing dynamic reconfigurable systems, through the exploration of the solution space, in order to evaluate the most effective solutions that are compatible with the design constraints.

- Operating System support for reconfigurable computing. Develop an operating system, for FPGA-based architecture, able to determine where a module should be conÞgured, and to provide an interface towards the Þnal user in order to request a hardware application in a simpliÞed way. The operating system has to be able to manage on-demand module conÞguration on an FPGA while providing a set of high-level abstractions to user applications.

- Methodologies for hardware/software co-design of embedded systems. Aim of this research work is the development of a methodology and a set of tools for capturing specifications of control-dominated systems, design space exploration, hardware/software partitioning, co-synthesis and co-simulation.

Membership of professional societies

- Program committee member of: IEEE Reconfigurable Architectures Workshop (RAW) 2007, 2008, 2009 and 2010, IEEE International Conference on Field Programmable Logic and Applications (FPL) 2008, 2009 and 2010, IEEE Computer Society Annual Symposium on VLSI (ISVLSI) 2009, IEEE Computer Society Annual Symposium on VLSI (ISLVSI) 2009 and 2010, IEEE/IFIP International Conference on Embedded and Ubiquitous Computing 2009, International Conference on ReConFigurable Computing and FPGAs (ReConFig) 2006, 2008 and 2009, IEEE Southern Conference on Programmable Logic (SPL) Conference 2008, 2009 and 2010, IEEE Field Programmable Technology (FPT) 2007, 2008 and 2009, Engineering of Reconfigurable Systems and Algorithms (ERSA) Conference 2006, 2007, 2008, 2009, and 2010, Workshop on Reconfigurable Computing (WRC): 2010, IEEE International Conference on Networking, Architecture, and Storage (NAS): 2010, International Workshop on Highly Efficient Accelerators and Reconfigurable Technologies (HEART): 2010.

- IEEE member since 2005, IEEE Computer Society (CS) and IEEE Circuits and Systems Society (CAS) member since 2008. ACM member since 2008.

- Italian Scientists and Scholars of North America Foundation (ISSNAF), member since 2009

Activities in conferences/journal organization

- Program Co-Chair of the International Conference on Field Programmable Logic and Applications (FPL) 2010

- Guest editor for the Journal of Systems Architecture. Elsevier JAS Special Issue on *Design Flows and System Architectures for Adaptive Computing on Reconfigurable Platforms*;

- Guest editor for the EURASIP Journal of Embedded Systems. EURASIP JES Special Issue on *Reconfigurable computing and hardware/software codesign*;

- Special Session Organizer for: IEEE International Symposium on Circuits and System 2007 and 2010 (ISCAS 07, ISCAS 2010), International Conference on Very Large Scale Integration (IFIP VLSI-SoC07);

- Session Chair for: IEEE Reconfigurable Architecture Workshop (RAW07 and RAW 2008), IEEE International Symposium on Circuits and System (ISCAS07 and ISCAS 2010), Engineering of Reconfigurable Systems and Algorithms Conference 2006 (ERSA06), IEEE Southern Conference on Programmable Logic Conference 2007 (SPL07), International Conference on Industrial and Information System (ICIIS07)

- International Coordinator and Workshop chair for the first Reconfigurable Computing Workshop during the International Conference on Industrial and Information System (ICIIS 07) conference

Publications

- Book: 1

- Number of papers in refereed journals and book chapters: 14

- International conferences: 76