

# Laura Carnevali

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## Education

- Ph.D. in Informatics, Multimedia and Telecommunications Engineering. Università degli Studi di Firenze, April 21<sup>st</sup>, 2010.
  - Period: January 2007 - December 2009.
  - Thesis: Formal Methods in the Development Life Cycle of Real-Time Software.
  - Advisors: Prof. Enrico Vicario, Prof. Giacomo Bucci.
- Qualifying examination for Professional Practice as Informatics Engineer. Università degli Studi di Firenze, January 2007.
- Master Degree in Informatics Engineering. Università degli Studi di Firenze, September 26<sup>th</sup>, 2006.
  - Period: September 2004 - September 2006.
  - Thesis: Testing della Tempificazione di Componenti Software in Tempo Reale.
  - Advisors: Prof. Enrico Vicario, Prof. Giacomo Bucci.
  - Final mark: *110/110 cum laude et encomio*.
- Bachelor Degree in Informatics Engineering. Università degli Studi di Firenze, September 14<sup>th</sup>, 2004.
  - Period: September 2001 - September 2004.
  - Thesis: Tecnologie e Metodi per l'Integrazione di Applicazioni nel Contesto del Progetto ORIS.
  - Advisors: Prof. Enrico Vicario, Prof. Giacomo Bucci.
  - Final mark: *110/110 cum laude*.
- High School Diploma, Liceo Scientifico Statale "Niccolò Copernico", Prato, July 7<sup>th</sup>, 2001.
  - Period: September 1996 - July 2001.
  - Final mark: *100/100*.

## Academic experience

*Università degli Studi di Firenze, Facoltà di Ingegneria, Dipartimento di Sistemi e Informatica*

- Post-doc fellow at the Software Technologies Lab, January 2010 – now.
- Teacher of the course "Fondamenti di Informatica", Bachelor Degree in Mechanical Engineering, 54 hours (6 CFU), Academic Year 2011/2012.

- Teaching assistant for the course “Fondamenti di Informatica I” (Prof. Enrico Vicario), Master Degree in Informatics Engineering, 15 hours. Academic Year 2010/2011.
- Teaching assistant for the course “Fondamenti di Informatica I” (Prof. Enrico Vicario), Master Degree in Informatics Engineering. Academic Years 2006/2007, 2007/2008, 2008/2009, 2009/2010.
- Teaching assistant for the course “Architettura e Organizzazione dei Calcolatori” (Prof. Giacomo Bucci), Master Degree in Informatics Engineering. Academic Years 2009/2010, 2010/2011.
- Teaching assistant for the course “Calcolatori Elettronici II” (Prof. Giacomo Bucci), Master Degree in Informatics Engineering. Academic Year 2008/2009.
- Co-advisor of several thesis in Informatics Engineering.

## Research

### *Main interests*

- Quantitative evaluation of concurrent systems with non-Markovian temporal parameters.
- Integration of formal methods along the development life cycle of real-time software.

### *Projects*

- Participant in the *REICA* project (REte per l’Innovazione nella filiera dei CAMper) funded by the Tuscany Region in 2008: requirements analysis and architectural project of an application for elaboration of faults and repairs data, evaluation of reliability rewards, and generation of alarms to the user.
- Participant in the *WISEDEMON* project (WIreless SENSOR networks for DEpendable MONitoring of critical applications - Affidabilità e qualità del servizio in sistemi di monitoraggio basati su Wireless Sensor Networks per applicazioni critiche) funded by the Italian Ministry of University and Research as a part of the PRIN 2007 Program.

### *Participation to Schools and Doctorate Courses*

- Graduate Course on Process Algebras for Quantitative Analysis.
  - Prof. Jane Hillston (University of Edinburgh).
  - Università degli Studi di Pisa, February 8<sup>th</sup> - 12<sup>nd</sup>, 2010.
  - Markov processes; Stochastic Process Algebras (SPAs); software support for SPAs.
- Graduate Course on Embedded Control Systems: Theory and Practice.
  - Real-Time Systems Laboratory, Scuola Superiore Sant’Anna, Pisa, June 8<sup>th</sup> - 12<sup>nd</sup>, 2009.
  - Schedulability analysis of real-time systems; OSEK standard; ERIKA kernel; real-time networks.
- International Summer School on Software Engineering.
  - Università degli Studi di Salerno, September 22<sup>nd</sup> - 25<sup>th</sup>, 2008.
  - Software architectures; practical model-based testing with the Unified Modeling Language (UML); service-oriented applications testing.

- Graduate Course on Real-Time Systems for Microcontrollers: OSEK Standard and Experiments on Microcontroller Devices.
  - Real-Time Systems Laboratory, Scuola Superiore Sant’Anna, Pisa, March 26<sup>th</sup> - 28<sup>th</sup>, 2007.
  - Schedulability analysis of real-time systems; OSEK standard.

## Publications

### Publications in international journals

- L. Carnevali, L. Ridi, and E. Vicario, *Putting preemptive Time Petri Nets to work in a V-Model SW life cycle*, IEEE Transactions on Software Engineering, November/December 2011.
- G. Bucci, L. Carnevali, L. Ridi, E. Vicario, *Oris: a Tool for Modeling, Verification and Evaluation of Real-Time Systems*, International Journal on Software Tools for Technology Transfer, Volume 12, Number 5, pages 391–403, 2010.
- E. Vicario, L. Sassoli, and L. Carnevali, *Using Stochastic State Classes in Quantitative Evaluation of Dense-Time Reactive Systems*, IEEE Transactions on Software Engineering, Volume 35, Number 5, pages 703–719, September/October 2009.
- L. Carnevali, L. Grassi, and E. Vicario, *State-density functions over DBM domains in the analysis of non-Markovian models*, IEEE Transactions on Software Engineering, Volume 35, Number 2, pages 178–194, March/April 2009.

### Publications in conferences and workshops

- L. Carnevali, L. Ridi, and E. Vicario, *A framework for simulation and symbolic state space analysis of non-Markovian models*, 30<sup>th</sup> International Conference on Computer Safety, Reliability and Security (SAFECOMP), Napoli, Italy, September 2011.
- L. Carnevali, L. Ridi, and E. Vicario, *Sirio: A framework for simulation and symbolic state space analysis of non-Markovian models*, Proceedings of the 8<sup>th</sup> International Conference on the Quantitative Evaluation of SysTems (QEST), Aachen, Germany, September 2011.
- L. Carnevali, F. Patara, A. Pinzuti, and E. Vicario, *A quantitative approach to run-time monitoring of Markovian concurrent systems*, Proceedings of the 2<sup>th</sup> Workshop on Informatica Quantitativa (InfQ), Lipari, Italy, June 2011.
- L. Carnevali, G. Lipari, A. Pinzuti, and E. Vicario, *A formal approach to design and verification of two-level Hierarchical Scheduling systems*, Proceedings of the 16<sup>th</sup> International Conference on Reliable Software Technologies - Ada-Europe, Edinburgh, United Kingdom, June 2011.
- L. Carnevali, J. Giuntini, and E. Vicario, *A symbolic approach to quantitative analysis of preemptive real-time systems with non-Markovian temporal parameters*, Proceedings of the 5<sup>th</sup> International ICST Conference on Performance Evaluation Methodologies and Tools (VALUETOOLS), Cachan (Paris), France, May 2011.
- L. Carnevali, L. Ridi, and E. Vicario, *Partial stochastic characterization of timed runs over DBM domains*, Proceedings of the 9<sup>th</sup> International Workshop on Performability Modeling of Computer and Communication Systems (PMCCS), Eger, Hungary, September 2009.
- L. Carnevali, L. Ridi, and E. Vicario, *Stochastic Fault Trees for cross-layer power management of WSN monitoring systems*, Proceedings of the 14<sup>th</sup> IEEE International Conference on Emerging Technologies and Factory Automation (ETFA), Mallorca, Spain, September 2009.

- L. Carnevali, D. D'Amico, L. Ridi, and E. Vicario, *Automatic Code Generation from Real-Time Systems Specifications*, Proceedings of the 20<sup>th</sup> IEEE/IFIP International Symposium on Rapid System Prototyping (RSP), Paris, France, June 2009.
- G. Bucci, L. Carnevali and E. Vicario, *A tool supporting evaluation of non-Markovian Fault Trees*, Proceedings of the 5<sup>th</sup> International Conference on the Quantitative Evaluation of SysTems (QEST), St. Malo, France, September 2008.
- L. Carnevali, L. Grassi, and E. Vicario, *A tailored V-Model exploiting the theory of preemptive Time Petri Nets*, Proceedings of the 13<sup>th</sup> International Conference on Reliable Software Technologies - Ada-Europe (volume 5026 of Lecture Notes in Computer Science, pages 87-100, Springer, 2008), Venice, Italy, June 2008.
- L. Carnevali, L. Sassoli, and E. Vicario, *Sensitization of symbolic runs in Real-Time Testing using the ORIS tool*, Proceedings of the 12<sup>th</sup> IEEE International Conference on Emerging Technologies and Factory Automation (ETFA), Patras, Greece, September 2007.
- L. Carnevali, L. Sassoli, and E. Vicario, *Casting Preemptive Time Petri Nets in the Development Life Cycle of Real-Time Software*, Proceedings of the 19<sup>th</sup> Euromicro Conference on Real Time Systems (ECRTS), Pisa, Italy, July 2007.

#### Publications in international journals (under review)

- L. Carnevali, L. Ridi, and E. Vicario, *A quantitative approach to input generation in real-time testing of stochastic systems*, submitted to IEEE Transactions on Software Engineering, under review (major revision submitted on November 15, 2011).
- L. Carnevali, A. Pinzuti, and E. Vicario, *Compositional verification for Hierarchical Scheduling of Real-Time systems*, submitted to IEEE Transactions on Software Engineering, under review.
- I. Bicchierai, G. Bucci, L. Carnevali, E. Vicario, *Combining UML-MARTE and preemptive Time Petri Nets: An Industrial Case Study*, submitted to IEEE Transactions on Industrial Informatics, under review.

#### Professional activities

- Participation to conferences and workshops
  - 8<sup>th</sup> International Conference on the Quantitative Evaluation of SysTems (QEST), Aachen, Germany, September 5<sup>th</sup> - 8<sup>th</sup>, 2011.
  - 2<sup>th</sup> Workshop on Informatica Quantitativa (InfQ 2011), Lipari, Italy, June 27<sup>th</sup> - 29<sup>th</sup>, 2011.
  - 5<sup>th</sup> International ICST Conference on Performance Evaluation Methodologies and Tools (VALUETOOLS 2011), Cachan (Paris), France, May 17<sup>th</sup> - 19<sup>th</sup>, 2011.
  - Informatica Quantitativa (InfQ 2010), Università degli Studi di Pisa, July 7<sup>th</sup> - 9<sup>th</sup>, 2010.
  - Workshop “Sistemi real-time”, Università degli Studi di Firenze, November 3<sup>rd</sup>, 2009.
  - 14<sup>th</sup> IEEE International Conference on Emerging Technologies and Factory Automation (ETFA 2009), Palma de Mallorca, Spain, September 23<sup>th</sup> - 25<sup>th</sup>, 2009.
  - 20<sup>th</sup> IEEE/IFIP International Symposium on Rapid System Prototyping (RSP 2009), Paris, France, June 24<sup>th</sup> - 26<sup>th</sup>, 2009.
  - International Workshop on Timing and Stochasticity in Petri nets and other models of concurrency (TiSto 2009), Paris, France, June 23<sup>th</sup>, 2009.

- 12<sup>th</sup> IEEE International Conference on Emerging Technologies and Factory Automation (ETFA 2007), Patras, Greece, September 25<sup>th</sup> - 28<sup>th</sup>, 2007.
- 19<sup>th</sup> Euromicro Conference on Real-Time Systems (ECRTS 2007), Scuola Superiore Sant'Anna, Pisa, July 4<sup>th</sup> - 6<sup>th</sup>, 2007.
- Workshop Italiano su Real-Time Embedded Systems (WIRTES 2007), Scuola Superiore Sant'Anna, Pisa, July 2<sup>nd</sup>, 2007.
- Reviewer for *IEEE Transactions on Software Engineering* and for *Real-Time Systems*.

## Technical skills

- *Programming languages*: C, C++, C#, Java.
- *Real-time operating systems*: Linux-RTAI.
- *Database management systems*: MySQL.

## Languages

ITALIAN. Mothertongue.

INGLESE. Good written and verbal skills.

- *First Certificate in English (FCE)*. British Institute of Florence, March 2001. Final mark: *B*.

## Other working experiences

- Teacher of the training course "Introduzione a Java" at C.S.I.A.F. (Centro Servizi Informatici dell'Ateneo Fiorentino), 32 hours, April - May 2009.
- Teacher of the training course "MySQL" at C.S.I.A.F. (Centro Servizi Informatici dell'Ateneo Fiorentino), 24 hours, February - March 2009.
- Teacher of the training course "MySQL" at C.S.I.A.F. (Centro Servizi Informatici dell'Ateneo Fiorentino), 24 hours, March 2008.
- Teacher of the training course "Laboratorio di programmazione Java" of the I.F.T.S. (Istruzione e Formazione Tecnica Superiore) course "Tecnico superiore per lo sviluppo del software", Istituto Statale di Istruzione Superiore "Niccolò Machiavelli", Firenze, 85 hours, November 2006 - February 2007.

Firenze, November 20<sup>th</sup>, 2011

Laura Carnevali