Giuseppe Lipari

Contact Information

TeCIP
Scuola Superiore Sant'Anna
via Moruzzi 1
56124 Pisa

Tel: +39 050 882030
Fax: +39 050 882003
e-mail: g.lipari@sssup.it
web: http://retis.sssup.it/~lipari

Personal data Born on 22/06/1971 in Marsala (Italy)
Resident in Pisa (Italy)

Education

Scuola Superiore Sant'Anna

- Ph.D. in Computer Engineering, December 2000 with Thesis: “Resource Reservation in Real-Time Systems”

University of Pisa

- Laurea degree in “Ingegneria Informatica”, December 1996, Thesis “Progetto e Realizzazione di Meccanismi di Nucleo per la Gestione di Processi Real-Time e delle loro Interazioni”, 110 cum laude

Academic Career

Scuola Superiore Sant'Anna

- From May 2000 to August 2005: Assistant Professor
- From August 2005 to present: Associate Professor

Research interests

Real-Time and Embedded systems. Scheduling and schedulability analysis. Hierarchical scheduling systems. Component-based real-time systems. Real-time operating systems. Real-Time distributed systems and Wireless Sensor Networks.

Publications

Books and Book chapters

- M. Chitnis, P. Pagano, L. Santinelli, C. Salvadori, M. Petracca, G. Lipari, “Distributed visual surveillance with resource constrained embedded systems”, book chapter in *Visual Information Processing in Wireless Sensor Networks: Technology, Trends and Applications*, Li-Minn Ang and Kah Phooi Seng editors, Information Science Reference (September 2011)
- G. C. Buttazzo, G. Lipari, L. Abeni and M. Caccamo, Soft Real-Time Systems: Predictability vs. Efficiency, Springer, January 2005
- Paolo Ancilotti, Maurelio Boari, Anna Ciampolini e Giuseppe Lipari, Sistemi Operativi, Mc-Graw Hill, July 2004 (in Italian)

Journals

- A.L. Ruscelli, G. Cecchetti, A. Alifano, G.Lipari, "Enhancement of QoS support of HCCA schedulers using EDCA function in IEEE 802.11e networks", Ad Hoc Networks Journal, DOI: 10.1016/j.adhoc.2010.09.014

- Michal Sojka, Pavel Píša, Dario Faggioli, Tommaso Cucinotta, Fabio Checconi, Zdeněk Hanzálek and Giuseppe Lipari, "Modular software architecture for flexible reservation mechanisms on heterogeneous resources", Journal of Systems Architecture Volume 57, Issue 4, April 2011, Pages 366-382,
- Tommaso Cucinotta, Luigi Palopoli, Luca Abeni, Dario Faggioli, Giuseppe Lipari, "On the integration of application level and resource level QoS control for real-time applications," accepted on IEEE Transactions on Industrial Informatics
- Tommaso Cucinotta, Luca Abeni, Luigi Palopoli, Giuseppe Lipari, "A robust mechanism for adaptive scheduling of multimedia applications," accepted on ACM Transactions on Embedded Computing Systems
- Luca Abeni, Luigi Palopoli, Claudio Scordino, Giuseppe Lipari, "Resource Reservations for General Purpose Applications", IEEE Transactions on Industrial Informatics, Volume 5:1, Pages 12-21, February 2009.
- Tommaso Cucinotta, Antonio Mancina, Gaetano Anastasi, Giuseppe Lipari, Leonardo Mangeruca, Roberto Checcozzo, Fulvio Rusina, "A Real-time Service-Oriented Architecture for Industrial Automation", IEEE Transactions on Industrial Informatics Volume 5, Number 3, August 2009
- Enrico Bini, Giorgio C. Buttazzo, Giuseppe Lipari, "Minimizing CPU energy in real-time systems with discrete speed management." ACM Trans. Embedded Comput. Syst. 8(4): (2009)
- Marko Bertogna, Michele Cirinei, Giuseppe Lipari: Schedulability Analysis of Global Scheduling Algorithms on Multiprocessor Platforms. IEEE Trans. Parallel Distrib. Syst. 20(4): 553-566 (2009)
- Luigi Palopoli, Tommaso Cucinotta, Luca Marzario, Giuseppe Lipari, "AQuoSA - adaptive quality of service architecture." Softw., Pract. Exper. 39(1): 1-31 (2009)
- Rodrigo Santos, Giuseppe Lipari, Jorge Santos, "Improving the schedulability of soft real-time open dynamic systems: The inheritor is actually a debtor", Journal of Systems and Software, vol. 81, pagg. 1093 – 1104, 2008
- Rodolfo Pellizzoni, Giuseppe Lipari, "Holistic analysis of asynchronous real-time transactions with earliest deadline scheduling", Journal of Computer and System Sciences, vol 73, pagg. 186 – 206 , 2007
- Claudio Scordino, Giuseppe Lipari, "A Resource Reservation Algorithm for Power-Aware Scheduling of Periodic and Aperiodic Real-Time Tasks", IEEE Transactions on Computers, Vol. 55, No. 12, pp. 1509 – 1522, Dec. 2006
- G. Lipari, P. Gai, M. Trimarchi, G. Guidi, P. Ancilotti, "A hierarchical framework for component-based real-time systems", Electronic Notes in Theoretical Computer Science (ENTCS), vol. 116, January 2005
- Mauro Pezzè, Andrea Baldini, Giovanni Denaro, Giuseppe Lipari, Matteo Rossi, Davide Rogai, "QUACK: A Platform for the Quality of New Generation Integrated Embedded Systems", Electronic Notes in Theoretical Computer Science, n. 116, Jan. 2005
- Rodolfo Pellizzoni and Giuseppe Lipari, "Feasibility Analysis of Real-Time Periodic Tasks with Offsets", Real-Time Systems, vol. 30, No. 1-2, May 2005
- L. Abeni, T. Cucinotta, G. Lipari, L. Marzario and L. Palopoli, "QoS Management through Adaptive Reservations", Real-Time Systems, vol 29, No. 2-3, March 2005
- Giuseppe Lipari, Gerardo Lamastra and Luca Abeni, "Task Synchronisation in Reservation-Based Real-Time Systems", IEEE Transactions on Computers, December 2004.
- Giuseppe Lipari, Enrico Bini, "A methodology for designing hierarchical scheduling systems", Journal of Embedded Computing, Vol. 1, No. 2, pp. 257-269, Cambridge International Science Publishing, Apr. 2005.
- Giuseppe Lipari, Enrico Bini, Gerhard Fohler, “A Framework for Composing Real-Time Schedulers”, Electronic Notes in Theoretical Computer Science (2003)

- Paolo Gai, Giuseppe Lipari, Marco Di Natale, "Stack size minimization for embedded real-time system on-a-chip", Design Automation for Embedded Systems, volume 7, nos. 1/2 sept 2002, Kluwer Publisher.
- Luigi Palopoli and Giuseppe Lipari and Gerardo Lamastra and Luca Abeni and Gabriele Bolognini and Paolo Ancilotti "An object oriented tool for simulating distributed real-time control systems", Software - Practice and Experience, 2002.
- G.C. Buttazzo, G. Lipari, M. Caccamo, L. Abeni, "Elastic Scheduling for Flexible Workload Management", IEEE Transactions on Computers, Vol. 51, No. 3, pp. 289-302, March 2002.
- G. Lipari and G.C. Buttazzo, "Schedulability Analysis of Periodic and Aperiodic Tasks with Resource Constraints", Journal of System Architectures, 46 (2000), pp 327-338

Recent Conference papers (last 5 years)

- Laura Carnevali, Alessandro Pinzuti, Enrico Vicario, Giuseppe Lipari, "A formal approach to design and verification of two-level hierarchical scheduling systems", 16th International Conference on Reliable Software Technologies, Ada-Europe 2011, Edinburgh, UK, 20-24 June 2011.
- Sunil Kumar, Tommaso Cucinotta, Giuseppe Lipari, "A Latency Simulator for Many-core Systems," to appear in Proceedings of the 44th Annual Simulation Symposium (ANSS 2011), part of the Spring Simulation Multiconference (SpringSim'11)
- G. Cecchetti, A.L. Ruscelli, A. Alifano, G.Lipari, Improving the QoS support in HCCA-EDCA mixed IEEE 802.11e networks, CNIT ITWDC 2010, Ponza Island, Italy.
- A.L. Ruscelli, G. Cecchetti, S. Gopalakrishnan, G. Lipari, A model for the design of wireless sensor network using geografic routing, IEEE Globecom 2010 UbiCoNet workshop, Miami, FL
- Giuseppe Lipari, Enrico Bini, "A framework for hierarchical scheduling on multiprocessors: from application requirements to run-time allocation", in Proceedings of the Real-Time System Symposium, Dec 2010, San Diego (CA)
- Mangesh Chitnis, Claudio Salvadori, Matteo Petracca, Giuseppe Lipari, Paolo Pagano, "Traffic related observations by line sensing techniques.", SenSys 2010: 373-374
- Luca Santinelli, Mangesh Chitnis, Christian Nastasi, Fabio Checconi, Giuseppe Lipari, Paolo Pagano, "A Component-Based Architecture for Adaptive Bandwidth Allocation in Wireless Sensor Networks.", SIES 2010: 174-183
- Nicola Serreli, Giuseppe Lipari, Enrico Bini "The Demand Bound Function Interface of Distributed Sporadic Pipelines of Tasks Scheduled by EDF", in Proceedings of ECRTS, 3-5 July 2010, Bruxelles, pp. 187-196
- Dario Faggioli, Giuseppe Lipari, Tommaso Cucinotta "The Multiprocessor Bandwidth Inheritance Protocol" in Proceedings of ECRTS, 3-5 July 2010, Bruxelles, pp. 90-99 (pdf)
- Christian Nastasi, Mauro Marinoni, Luca Santinelli, Paolo Pagano, Giuseppe Lipari, Gianluca Franchino, "BACCARAT: a dynamic real-time bandwidth allocation policy for IEEE 802.15.4", PerCom Workshops 2010, pp 406-412
- Nicola Serreli, Giuseppe Lipari, Enrico Bini, "The Distributed Deadline Synchronization Protocol for Real-Time Systems Scheduled by EDF", Proceedings of ETFA, Bilbao, 13-15 Sept. 2010 (pdf)
- Gaetano F. Anastasi, Enrico Bini, Antonio Romano, Giuseppe Lipari, "A Real-Time Reconfiguration Infrastructure for Distributed Embedded Control Systems", Proceedings of ETFA, Bilbao, 13-15 Sept. 2010
- Fabio Checconi, Tommaso Cucinotta, Dario Faggioli, Giuseppe Lipari, "Hierarchical Multiprocessor CPU Reservations for the Linux Kernel", in Proceedings of the 5th International Workshop on Operating Systems Platforms for Embedded Real-Time Applications (OSPERT 2009), Dublin, Ireland, June 2009

- Tommaso Cucinotta, Giuseppe Lipari, Luigi Palopoli, Luca Abeni, Rodrigo Santos, "Multi-level feedback control for Quality of Service Management", in Proceedings of the 14th IEEE International Conference on Emerging Technologies and Factory Automation, Palma de Mallorca (ETFA 2009), Spain, September 2009
- Mangesh Chitnis, Yao Liang, Jiang Yu Zheng, Paolo Pagano, Giuseppe Lipari, "Wireless Line Sensor Network for Distributed Visual Surveillance", in Proceedings of 6th ACM PE-WASUN 2009, Tenerife, Canary Islands, Spain, October 2009
- Paolo Pagano, Francesco Piga, Giuseppe Lipari, Yao Liang: Visual tracking using sensor networks. SimuTools 2009: 28
- Paolo Pagano, Mangesh Chitnis, Antonio Romano, Giuseppe Lipari, Ricardo Severino, Mário Alves, Paulo G. Sousa, Eduardo Tovar, "ERIKA and open-ZB: an implementation for real-time wireless networking." SAC 2009: 1687-1688
- Luigi Palopoli, Luca Abeni, Tommaso Cucinotta, Giuseppe Lipari, Sanjoy Baruah, "Weighted Feedback Reclaiming for Multimedia Applications", 6th IEEE Workshop on Embedded Systems for Real-Time Multimedia, October 2008
- Luca Abeni, Claudio Scordino, Giuseppe Lipari, “Serving non real-time tasks in a reservation environment”, Real-Time Linux Workshop, 2008
- Rodrigo Santos, Giuseppe Lipari, Enrico Bini, “Efficient on-line schedulability test for feedback scheduling of soft real-time tasks under fixed-priority”, IEEE Real-Time and Embedded Technology and Applications Symposium, Saint Louis USA (2008)
- Antonio Mancina, Jorrit Herder, Ben Gras, Andrew Tanenbaum, Giuseppe Lipari, "Enhancing a Dependable Multiserver Operating System with Temporal Protection via Resource Reservations", 16th International Conference on Real-Time and Network Systems, Rennes, France, October 2008
- Michele Cirinei, Enrico Bini, Giuseppe Lipari, Alberto Ferrari, “A Flexible Scheme for Scheduling Fault-Tolerant Real-Time Tasks on Multiprocessors”, Proceedings of the 21th IEEE International Parallel and Distributed Processing Symposium, IPDPS Apr. 2007
- Paolo Pagano, Prashant Batra, Giuseppe Lipari, “A Framework for Modeling Operating System Mechanisms in the Simulation of Network Protocols for Real-Time Distributed Systems”, Proceedings of the 21th IEEE International Parallel & Distributed Processing Symposium, IPDPS Apr. 2007
- P.Gai, G. Lipari, M. Di Natale, N. Serreli, L. Palopoli, A. Ferrari, “Adding Timing Analysis to Functional Design to Predict Implementation Errors”, SAE International Conference, Detroit USA, Apr. 2007
- Mangesh Chitnis, Paolo Gai, Giuseppe Lipari, Paolo Pagano, Antonio Romano, "Impact Of The Operating System on the QoS offered by an IEEE 802.15.4-compliant Sensor Network", Proceedings of the 7th IFAC International Conference on Fieldbuses and networks in industrial and embedded systems, Tolouse France, Nov.2007
- Mangesh Chitnis, Paolo Gai, Giuseppe Lipari, Paolo Pagano, Antonio Romano, "Rapid prototyping suite of IEEE 802.15.4-compliant Sensor Networks", Proceedings of the the 4th IEEE International Conference on Mobile Ad-hoc and Sensor Systems, Pisa Italy, Oct 2007
- Cesare Bartolini, Giuseppe Lipari, Luis Almeida, "Using priority inheritance techniques to override the size limit of CAN messages", Proceedings of the 7th IFAC International Conference of Fieldbuses & Networks in Industrial & Embedded Systems (FET), Tolouse France, Nov. 2007
- Paolo Pagano, Mangesh Chitnis, Giuseppe Lipari, "RTNS: an NS-2 Extension to Simulate Wireless Real-Time Distributed Systems for Structured Topologies", Proceedings of the 3rd Annual International Wireless Internet Conference, Austin, TX, USA, Oct. 2007

Invited Talks

“Contract-based Scheduling: An Overview of the Results of the FIRST EU Project”, invited talk at MOTIVES, ARTIST2 Winter School in Trento, Februrary 2007

“Recent Results on Component-based Methodologies for Real-Time scheduling analysis”, invited talk at RTNS conference, September 2011, Nantes.

Academic Service

Associate Editor of IEEE Transactions on Computers, from 2005 to 2010

Associate Editor of the Journal of System Architecture, Elsevier, from 2010 to present

Program Chair of the OSPERT 2005 workshop on Operating Systems Platforms for Embedded Real-Time Systems (in conjunction with ECRTS 2005 in York)

Program Chair of ECRTS 2006 in Dresden

Program Co-Chair of the Real-Time System Track of SAC 2010 (with Rodrigo Santos and Paulo Martins)

Program Co-Chair of WATERS 2010 and 2011, (Workshop on Analysis Tools and Methodologies for Embedded and Real-Time Systems, in conjunction with ECRTS) with Tommaso Cucinotta

Program Co-Chair of OPODIS 2011 (International Conference On Principles Of Distributed Systems), with Antonio Fernandez Anta

Program Co-Chair of the “Real-Time, Networked, and Dependable Systems” track at DATE 2012, with Peter Puschner

Member of program Committees and reviews

Member of several program committees, here are the main ones:

- the Real-Time System Symposium for 6 editions, from 2001 to present.
- The ECRTS conference for 7 editions, from 2002 to present
- The RTAS conference in 2004, 2007, 2008
- The EMSOFT conference in 2004
- the DATE conference from 2008 to present
- the ETFA conference from 2009 to present

Reviewer of many papers for IEEE Transactions on Computers, IEEE Transactions on Parallel and Distributed Systems, IEEE Transaction in Industrial Informatics, IEEE Transactions on Embedded Computing Systems, ACM Transactions on Computers, the Real-Time System journal, the Journal of System Architecture.

Research Projects

Scientific Coordinator for the research group of Scuola Superiore Sant'Anna in the following research projects financed by the European Community

- Flexible Integrated Real-Time Technology (FIRST)
- Open Components for Embedded Real-time Applications (OCERA)
- the ARTIST NoE for the V Framework Programme
- Framework for Real-time Embedded Systems based on ContRacts (FRESCOR)
- Radically Innovative Mechatronics and Advanced Control Systems (RI-MACS)

Part of the research group of the following projects

- Adaptivity and Control of Resources in Embedded Systems (ACTORS)
- Interactive Real-Time Multimedia Applications on Service Oriented Architectures (IRMOS)
- Service Oriented Operating Systems (SooS)

- ARTIST NoE

Student Supervision

In 2006, “opponent” member for the Ph.D. Dissertation of Thomas Lenvall and Radu Dobrin, at Malardalen University (Sweden)

In 2010, “opponent” member for the Ph.D. Dissertation of Moris Benham, at Malardalen University (Sweden)

Ph.D. Students supervised at Scuola Superiore Sant'Anna:

- Nicola Serreli, Ph.D. in 2010 with thesis “Component-based analysis and synchronization of distributed transactions scheduled by EDF”
- Mangesh Chitnis, Ph.D. in 2010 with thesis "A framework to support wireless multimedia sensor networks"
- Fabio Checconi, Ph.D. in 2009 with thesis "Proportional Share Scheduling in General Purpose Operating Systems: Theory and Practice”
- Antonio Mancina, Ph.D. in 2008 with thesis “Operating Systems and Resource Reservations”
- Marko Bertogna, Ph.D. in 2008 with thesis “Real-Time Scheduling Analysis for Multiprocessor Platforms”
- Michele Cirinei, Ph.D. in 2008 with thesis “Exploiting the Power of Multiprocessors for Real-Time Systems”
- Paolo Milani Comparetti, Ph.D. in 2008 with thesis “Automatically Reverse Engineering Network Protocols”
- Cesare Bartolini, Ph.D. in 2007 with thesis “Methodology and Analysis throughout the platform-based design pattern”
- Guglielmo De Angelis, Ph.D. in 2007 with thesis “Exploiting Extra Functional Model Annotations for B3G Applications”

Teaching

- “Real-Time Systems”, Laurea in Automation Engineering at the Faculty of Engineering, University of Pisa (6 credits, 48 h)
- “Object Oriented Software Design”, Graduate Program in Information Science and Technology, Scuola Superiore Sant'Anna (12 credits, 96 h)
- “Unix Programming” module in the “Operating Systems” course at the Laurea in Information Engineering at the Faculty of Engineering, University of Pisa (15 h)