Curriculum Vitæ

Enrico Bini

October 28, 2016

Contents

Current and Past Positions

23/01/2015 Youngest researcher eligible as **full processor** in Italian universities, in the area 09/H1 "Sistemi di elaborazione delle informazioni" (Computer Engineering), after the 2013 evaluation of the Italian national qualification procedure.

31/01/2014 Eligible as **associate processor** in Italian universities, in the area 01/B1 "Informatica" (Computer Science), after the 2012 evaluation of the Italian national qualification procedure.

04/12/2013 Eligible as **associate processor** in Italian universities, in the area 09/H1 "Sistemi di elaborazione delle informazioni" (Computer Engineering), after the 2012 evaluation of the Italian national qualification procedure.

Oct 2016–today Associate professor at University of Turin, Italy.

Apr 2007–Sep 2016 Assistant professor at Scuola Superiore Sant'Anna, Pisa, Italy.

Mar 2012–Feb 2014 Marie-Curie fellow at Lund University (on leave from Scuola Superiore Sant'Anna).

Sep 2005–Aug 2006 Post-doc at the Scuola Superiore Sant'Anna.

Jan–May 2001 Internship at **Ericsson Lab Italy**, R&D dept., Rome. Studying the software behavior under heavy load and stress conditions.

Education

Jan 2010 Diploma di Laurea Specialistica in Mathematics from Università di Pisa (grade: **110/110 e lode**), achieved on January 29th, 2010. Thesis title: *"Design of Optimal Control Systems"*.

Oct 2004 PhD degree in Computer Engineering from Scuola Superiore Sant'Anna (grade: **100/100 e lode**), achieved on October 1st, 2004. Thesis title: *"The Design Domain of Real-Time Systems"*.

Oct 2001 Diploma di Licenza from Scuola Superiore Sant'Anna (grade: **100/100 e lode**), achieved on October 26th, 2001. Thesis title: *"A method to perform time-variant load measure"*, work developed while visiting Ericsson Lab Italy, Rome.

Dec 2000 Diploma di Laurea (five years degree) in Computer Engineering from Università di Pisa (grade: **110/110 e lode**), achieved on December 13th, 2000. Thesis title: *"Developing real-time applications on embedded systems: the microcontroller ST10"*.

Nov 1995 Admitted to the undergraduate Engineering school of excellence Scuola Superiore Sant'Anna. Ranked **3rd among 331 participants** at national level.

May 1994 Admitted to the National Finals of the Mathematics Olympic Games.

Teaching

Mar 2017 Teacher of the course **Basics of Computer Science** for undergraduate students at University of Turin, 72 hours of teaching.

Nov 2016 Teacher of the course **Unix laboratory** for undergraduate students at University of Turin, 60 hours of teaching.

Apr 2016 Teacher of the course **Basics of C Programming** for undergraduate students at Scuola Superiore Sant'Anna, 30 hours of teaching.

Mar 2016 Teacher of the course **Component-based software design** within the Laurea Magistrale in Embdedded Computing Systems at Scuola Superiore Sant'Anna, 30 hours of teaching.

July 2015 Teacher of the lecture **Embedded Systems design and its Impact on Control**, within the course Design Flows for Control and Verification of Thermal Fluid Systems at University of Connecticut, 3 hours of teaching.

Mar 2015 Teacher of the course **Component-based software design** within the Laurea Magistrale in Embdedded Computing Systems at Scuola Superiore Sant'Anna, 30 hours of teaching.

May 2014 Teacher of the course **Real-Time Systems: an Optimal Design Approach** for PhD and master students at Scuola Superiore Sant'Anna, 10 hours of teaching.

Nov 2012 Teacher of the course **Advanced Real-Time Systems** for PhD and master students at Lund University, 7.5 ECTS.

Mar 2011 Teacher of the course **Optimization Methods** within the Laurea Magistrale congiunta in ICT by Scuola Superiore Sant'Anna and University of Trento, 48 hours of teaching and laboratory.

Mar 2010 Teacher of the course **Optimization Methods 2**, **discrete variables** within the Laurea Magistrale congiunta in ICT by Scuola Superiore Sant'Anna and University of Trento, 30 hours of teaching and laboratory.

Jan 2010 Teacher of the course **Optimization Methods 1**, **continuous variables** within the Laurea Magistrale congiunta in ICT by Scuola Superiore Sant'Anna and University of Trento, 30 hours of teaching and laboratory.

Mar 2008 Teaching Assistant of the course **Advanced Real-Time Systems** for PhD students at the Scuola Superiore Sant'Anna, 15 hours of teaching.

Oct 2007 Teacher of the course **Optimization Methods** at the Scuola Superiore Sant'Anna, 20 hours of teaching and laboratory.

Mar 2007 Teaching Assistant of the course **Advanced Real-Time Systems** for doctoral students at the Scuola Superiore Sant'Anna, 10 hours of teaching.

Sep 2006 Teacher of the course **Real-Time Operating Systems** at Ericsson Lab Italy, Rome, 12 hours of teaching;

Jan–Apr 2005 Teacher of the course **Design of Embedded Systems** within the Laurea Specialistica in Computer Engineering at Università di Siena. 60 hours of teaching and laboratory.

Sep–Dec 2004 Teacher of the course **Basics of Computer Architecture (Calcolatori Elettronici)** within the Laurea in Telecommunications Engineering at Università di Siena. 72 hours of teaching and laboratory.

Sep 2004–May 2005 Teaching Assistant of the course **Mathematics** for first year undergraduate students at Università di Pisa, Engineering faculty. 40 hours of exercises.

Feb 2002 Teacher of the course **Optimization Methods** at the Scuola Superiore Sant'Anna, 12 hours of teaching.

Visits and invitations

Visiting Periods

Mar 2012–Feb 2014 Marie-Curie fellowship at Lund University, Sweden, hosted by Karl-Erik Årzén.

Feb–Mar 2009 Visiting researcher at **INRIA Rocquencourt**, France, project AOSTE, invited by Yves Sorel.

Mar–Dec 2003 Visiting PhD student at **University of North Carolina at Chapel Hill**, USA, Computer Science Department, invited by Sanjoy Baruah.

Aug 1999–Feb 2000 Visiting student at Technische Universiteit Delft (TUD), The Nederlands, through the **Erasmus** European exchange program.

Invited talks

Oct 2015 Keynote speaker at the CSI Symposium on Real-Time and Embedded Systems and Technologies, Tehran, Iran. Title of the talk: "Challenges in the Design of Resource Constrained Cyber Physical Systems". Invited by Mehdi Kargahi.

Mar 2015 Invited speaker at the ***Dagstuhl*** *Seminar on Mixed Criticality on Multicore/Manycore Platforms*, seminar number 15121, Dagstuhl, Germany. Invited by Sanjoy Baruah, Liliana Cucu-Grosjean, Robert Davis, Claire Maiza.

Feb 2012 Invited speaker at the 1st Interdisciplinary Workshop on Algorithmic Challenges in Real-Time Systems, Berlin, Germany, invited by Sebastian Stiller, Nicole Megow, and Marko Bertogna.

Dec 2011 Invited speaker at the LCCC Workshop on Control of Computing Systems, Lund, Sweden. Invited by Karl-Erik Årzén and Anton Cervin.

Nov 2011 Invited speaker at the Workshop on Synthesis and Optimization Methods for Real-Time Embedded Systems, co-located with the 32nd IEEE Real-Time Systems Symposium, Vienna, Austria. Invited by Marco Di Natale.

Feb 2010 Invited speaker at the ***Dagstuhl*** *Seminar on Scheduling*, seminar number 10071, Dagstuhl, Germany. Invited by Susanne Albers, Sanjoy K. Baruah, Rolf H. Möhring, and Kirk Pruhs.

Oct 2009 Keynote speaker at the 17-th International Conference on Real-Time and Network Systems, Paris, France, October 26–27, 2009. Title of the talk: "The design is an optimization problem: the real-time control system case". Invited by Laurent George.

Feb 2008 Invited speaker at the ***Dagstuhl*** *Seminar on Scheduling*, seminar number 08071, Dagstuhl, Germany. Invited by Jane W. S. Liu, Rolf H. Möhring, and Kirk Pruhs.

Sep 2007 Invited lecturer at the **French Summer School on Real-Time** 2007 in Nantes. Title of the presentation "Minimising Energy Consumption in Real-Time Systems". Invited by Nicolas Navet.

Invited seminars

Nov 2016 Seminar at **University of Lille** on "Optimal Sampling for Linear Control Systems". Invited by Laurentiu Hetel.

Mar 2014 Seminar at **Università di Pisa** on "Optimal Sampling for Linear Control Systems". Invited by Giuseppe Buttazzo.

Jan 2014 Seminar at **Università di Trento** on "Optimal Sampling for Linear Control Systems". Invited by Luigi Palopoli.

Aug 2013 Seminar at **TU Munich** on "Optimal Sampling for Linear Control Systems". Invited by Samarjit Chakraborty.

Nov 2006 Seminar at **Università di Padova** on "Designing Hierarchical Embedded Systems". Invited by Tullio Vardanega;

Nov 2003 Seminar at **University of California at Berkeley** within the course "Design of Embedded Systems: Models, Validation and Synthesis". Title of the presentation: "Designing Real-Time Software". Invited by Alessandro Pinto.

Sep 2003 Seminar at **University of Illinois at Urbana-Champaign** within the course "Advanced Resource Management in Real-Time Systems". Title of the presentation: "Scheduling Tasks by Static Priority". Invited by Lui Sha.

Awards

1. **Best paper award** for the paper: Martina Maggio, Juri Lelli, Enrico Bini. "A Tool for Measuring Supply Functions of Execution Platforms". In *Proceedings of the 22nd IEEE International Conference on Embedded and Real-Time Computing Systems and Applications*, Daegu, South Korea, August 2016.

2. In 2011, elevated to the grade of **IEEE Senior member** (only 8% members are with this grade.)

3. **Premio Spitali** for the best scientific PhD thesis at the Scuola Superiore Sant'Anna of the two academic years 2003/04 and 2004/05.

4. **Best paper award** for the paper: Enrico Bini, Sanjoy K. Baruah. "Efficient computation of response time bounds under fixed-priority scheduling". In *Proceedings of the 15-th conference on Real-Time and Network Systems*, Nancy, France, March 2007.

5. **Best paper award** for the paper: Enrico Bini, Giorgio C. Buttazzo, Marko Bertogna. "The Multi Supply Function Abstraction for Multiprocessors", In *Proceedings of the 15-th IEEE International Conference on Embedded and Real-Time Computing Systems and Applications*, Beijing, China, August 2009.

PhD student supervision

Sep 2014 Supervisor of Andrea Parri, Scuola Superiore Sant'Anna. Research project: Scheduling real-time applications over virtualized multiprocessors.

May 2012 Co-supervisor of Artem Burmyakov, Polytechnic Institute of Porto, Portugal. Research project: Design of compositional real-time framework over multicore architectures.

Nov 2009 Supervisor of Giulio Mancuso, Scuola Superiore Sant'Anna, Pisa, Italy. Research project: Investigation of the effect of parallel execution platform over control systems.

Nov 2008 Supervisor of Stefano Fontanelli, Scuola Superiore Sant'Anna, Pisa, Italy. Research project: Development of a co-simulation platform for wireless network and vehicular transportation.

Research projects

Mar 2012–Feb 2014 Principal Investigator of the Marie-Curie Intra-European Fellowship project Vi-CyPhySys (Virtual Cyber Phisical Systems). Ranked 18th in the Engineering panel of all European submissions (3327 overall submissions, 507 in the panel of Engineering) with score 91.6/100. Overall budget of the project 250 KEuro.

Nov 2012–Oct 2014 Principal Investigator of the project GESTI, (Management of failures in sensor networks for energy savings) funded by Regione Toscana, in liaison with Telecom Italia, call POR CRO FSE 2007-2013, Decreto 27/12/2011 n. 6076. Ranked 10th over 183 (score 82.7/100).

Feb 2008–Jan 2011 Leader of the Scuola Superiore Sant'Anna research unit in the EU project funded under FP7, area Embedded Systems Design (ICT-2007.3.3) ACTORS (Adaptivity and Control of Resources in Embedded Systems), coordinated by Johan Eker, Ericsson AB, Sweden.

Jul 2006–Jun 2010 Leader of the Scuola Superiore Sant'Anna research unit in the FIRB project funded by the Italian Ministry of Education, University and Research ART-DECO (Adaptive InfRasTructures for DECentralized Organizations), coordinated by Carlo Ghezzi, Politecnico di Milano, Italy.

Services to the research community

Steering, advising committees

since 2015 Member of the Steering Committee of the CSI Symposium on Real-Time and Embedded Systems and Technologies

Project reviewer

- Israeli Science Foundation, Exact Sciences and Technology, Individual Research Grants, 2016

- Italian Ministry of University and Research, call "Futuro in Ricerca", 2013

- European Commission, FP7 framework program, call ICT Future Emerging Technologies (FET), 2011

Editorial service

2011 Guest Editor of ACM SIGBED Review, Volume 8, Issue 3, September 2011, special issue on Work-in-Progress (WiP) session of the 23rd Euromicro Conference on Real-Time Systems (ECRTS),

2011 Guest Editor of ACM SIGBED Review, Volume 8, Issue 1, March 2011, special issue on 3rd Workshop on Compositional Theory and Technology for Real-Time Embedded Systems (CRTS),

2008 Member of the Guest Editorial Board of the special issue on Power-Aware Computing of the International Journal of Embedded Systems.

Positions as chair

1. Program chair of the 25th International Conference on Real-Time Networks and Systems (RTNS 2017), Grenoble, France, October 2017.

2. Local Organization Chair of the Embedded Systems Week 2018 (ESWeek 2018), Turin, Italy.

3. Organizer and Program co-chair of the 1st Tutorial on Tools for Real-Time Systems (TuToR 2016) held during CPSWeek 2016, Vienna, Austria.

4. Organizer and Program co-chair of the Workshop on Real-Time Scheduling in the Linux Kernel (RTS-LIKE), June 2014, Pisa.

5. Program chair of the Workshop on Computation and Control (COMCO) held during CPSWeek 2013, Philadelphia, PA, USA.

6. Workshops chair of the 33rd IEEE Real-Time Systems Symposium (RTSS) 2012, San Juan, Puerto Rico.

7. Organizer of the Workshop on Emerging Problems in Real-Time Embedded Systems (EPRES), Pisa, Italy, July 2012.

8. Workshops chair of the 32nd IEEE Real-Time Systems Symposium (RTSS) 2011, Vienna, Austria.

9. Publicity chair (Europe) of the 17th IEEE International Conference on Embedded and Real-Time Computing Systems and Applications (RTCSA) 2011, Toyama, Japan.

10. Program chair of the Work-in-Progress session of the 23rd Euromicro Conference on Real-Time Systems (ECRTS) 2011, Porto, Portugal.

11. Program co-chair of the 3rd Workshop on Compositional Theory and Technology for Real-Time Embedded Systems (CRTS), San Diego, CA, USA, 2010

12. Organizer of the Workshop on multicores: theory and practice, Kaiserslautern, Germany, October 2008, organized within the EU research project ACTORS.

Invitation in PhD committees abroad

Sep 2015 Member of the examination committee of Thomasz Kloda PhD defence. Title of the dissertation: "Conditions d'ordonnançabilité pour un langage dirigé par le temps". Supervisor: Bruno d'Ausbourg. Université de Toulouse, France.

Dec 2014 Member of the examination committee of Rafia Inam PhD defence. Title of the dissertation: "Hierarchical scheduling in component based and multicore systems". Supervisor: Mikael Sjödin, Mälardalen University, Västerås, Sweden.

Apr 2014 Member of the examination committee of Martin Stigge PhD defence. Title of the dissertation: "Real-Time Workload Models: Expressiveness vs. Analysis Efficiency". Supervisor: Wang Yi, Department of Information Technology, Uppsala Universitet, Sweden.

Mar 2013 Opponent of Martin Korsgaard PhD defence. Title of the dissertation: "Process-Oriented Real-time Programming". Supervisor: Sverre Hendseth, Department of Engineering Cybernetics, Faculty of Information Technology, Mathematics and Electrical Engineering, Norwegian University of Science and Technology, Trondheim, Norway.

Oct 2012 Reviewer of Jan Kelbel PhD thesis. Title of the dissertation: "Scheduling in manufacturing systems". Supervisor: Zdeněk Hanzélek, Dep. Control Engineering, Faculty of Electrical Engineering, Czech Technical University, Prague, Czech Republic.

Jun 2012 Opponent of Yue Lu PhD defence. Title of the dissertation: "Pragmatic Approaches for Timing Analysis of Real-Time Embedded Systems". Supervisor: Thomas Nolte, Mälardalen University, Västerås, Sweden.

Program committees of conferences

Also, Enrico was invited in the Technical Program Committee (TPC) of 55 conferences, sorted by date of latest invitation

RTAS IEEE Real-Time and Embedded Technology and Applications Symposium: 2016, 2015, 2013, 2011, 2010, 2009;

EMSOFT International Conference on Embedded Software: 2016, 2011;

RTCSA-RT IEEE International Conference on Embedded and Real-Time Computing Systems and Applications, Real-Time Systems track: 2016, 2015, 2014, 2013, 2012, 2011, 2010, 2007;

RTNS International Conference on Real-Time and Network Systems: 2016, 2015, 2014, 2013, 2012, 2011, 2010, 2009, 2008, 2007;

V2CPS Workshop on Verification and Validation of Cyber-Physical Systems: 2016;

WATERS International Workshop on Analysis Tools and Methodologies for Embedded and Real-time Systems: 2016;

RTSS IEEE Real-Time Systems Symposium: 2015, 2014, 2010;

RTEST CSI Symposium on Real-Time and Embedded Systems and Technologies: 2015.

CRTS Workshop on Compositional Real-Time Systems: 2014, 2009;

RTCSA-UC International Conference on Embedded and Real-Time Computing Systems and Applications, Ubiquitous Computing/Cyber-Physical Systems Track: 2013, 2012, 2011;

ETFA-RTNES IEEE Emerging Technologies and Factory Automation, Real-Time and (Networked) Embedded Systems track: 2012, 2011, 2010;

ECRTS Euromicro Conference on Real-Time Systems: 2012, 2011, 2010;

SOMRES Workshop on Synthesis and Optimization Methods for Real-Time Embedded Systems: 2011;

MISTA Multidisciplinary International Scheduling Conference: Theory and Applications: 2011, 2009;

BWRTS Brazilian Workshop on Real-Time Systems: 2011;

ECRTS-WiP Euromicro Conference on Real-Time Systems, Work-in-Progress session: 2010, 2008;

COESD Workshop on Combinatorial Optimization for Embedded System Design: 2010;

RTSS-WiP IEEE Real-Time Systems Symposium, Work-in-Progress session: 2009, 2008;

SAC ACM Symposium on Applied Computing: 2008;

ECRTS-WiP Euromicro Conference on Real-Time Systems, Work-in-Progress session: 2008;

EUC IFIP International Conference on Embedded and Ubiquitous Computing: 2005.

	2008	2009	2010	2011	2012	2013	2014	2015	**total**
RTAS	8	10	0	11	8	0	7	?	44+?
ECRTS	7	3	10	10	10	0	0	?	40+?
RTSS	6	8	8	2	0	1	11	?	36+?
RTCSA	0	0	5	6	7	10	8	?	36+?
RTNS	5	3	5	3	3	4	4	?	27+?
ETFA	0	0	5	5	4	2	3	?	19+?
TC	5	1	3	2	2	1	4	?	18+?
RTSJ	0	1	7	4	0	1	1	?	14+?
EMSOFT	0	0	0	11	0	0	0	?	11+?
MISTA	0	5	0	2	0	0	0	?	7+?
TECS	0	1	0	0	2	2	0	?	5+?
TII	1	1	0	1	1	1	0	?	5+?
Automatica	0	0	0	1	1	2	0	?	4+?
SAC	4	0	0	0	0	0	0	?	4+?
IPL	1	1	0	0	1	0	0	?	3+?
DATE	1	0	1	0	1	0	0	?	3+?
SCHED	0	0	1	0	0	0	1	?	2+?
Algorithmica	0	0	2	0	0	0	0	?	2+?
others	3	2	0	2	5	0	8	?	20+?
total	41	36	47	60	45	24	47	38	338

Table 1: Reviewing work (data of last year are intentionally hidden).

Reviewing work

He has served the research community by reviewing papers submitted to the following journals (grouped by publishers):

IEEE Transactions on Computers; Transactions on Control Systems Technology; Access; Transactions on Parallel and Distributed Systems; Transactions on Industrial Informatics; Transactions on Control Systems Technology; Transaction on Computer-Aided Design; Computer; Transactions on Software Engineering; Transactions on Robotics;

ACM Transaction on Embedded Computing Systems;

Springer Algorithmica; Journal of Scheduling; Cluster Computing; Real-Time Systems; Journal of Computer Science and Technology;

Elsevier Journal of Logical and Algebraic Methods in Programming; Automatica; Advances in Space Research; Systems & Control Letters; Information Processing Letters; Journal of Systems Architecture; Journal of Systems and Software; Life Sciences in Space Research; Sustainable Computing, Informatics and Systems;

Oxford Journals The Computer Journal, IMA Journal of Mathematical Control and Information.

The number of reviews made personally is summarized in Table 1 (only data from 2008 is reported). Reviews are classified by event/journal (row) and year of assignment (column).

source	citations (inc. self-cit.)	H-index (inc. self-cit.)	citations (no self-cit. by any au.)	H-index (no self-cit. by any au.)
Google Scholar	2821	28	n/a	n/a
Scopus	1349	20	1115	19

Table 2: Summary of citations. (checked on 2016-05-23)

Publications

Publications in numbers   Enrico published 23 papers on journals. The publications on journal in the area of Computer Science and Engineering (in Italian: corrispondenti ai Settori Scientifico Disciplinari ING-INF/05 e INF/01) are classified according to "classes", as determined by the ANVUR for the 2004–2010 VQR evaluation:

- "Class 1" journal publications: 1 IEEE-TAC, 5 IEEE-TC, 3 IEEE-TII, 7 Springer-RTS, 2 ACM-TECS,

- "Class 2" journal publications: 1 IEEE-Micro,

- not listed in the ranking: 1 IJES, 1 JEC, 1 Elsevier-ENTCS.

- other research areas: 1 Automatica,

In addition, he published 65 papers on conference proceedings. The publications on conference proceedings in the area of Computer Science and Engineering, are classified according to the recent ranking by the GII-GRIN:

- "Class 1" conference publications: 9 RTSS,

- "Class 2" conference publications: 9 ECRTS, 2 IPDPS, 2 DATE, 3 RTAS,

- "Class 3" conference publications: 4 RTCSA, 2 ETFA,

- not listed in the ranking: 5 RTNS, 1 DASIP, 1 VNC, 2 IFAC-WC, 1 MISTA, 1 RTSS-WiP, 1 RTLW, 1 RTAS-demo, 2 RTAS-WiP, 5 CRTS, 1 ECRTS-WiP, 1 MAPSP, 1 COESD, 1 PARC, 2 DROPS, 1 WEA-CPS, 1 WARM.

- other research areas: 2 CDC, 1 ACC, 1 HSCC, 1 EBCCSP, 1 ECC,

The number of my co-authors is 54, belonging to 31 different institutions in 14 countries.

Some citation metrics are reported in Table2. The ten most cited papers are: [J6], [C62], [J7], [J8], [C12], [J20], [C15], [J18], [C65], and [C50].

Publications are classified by topic. Publications labeled as [Jx] appeared on journals, while publications labeled with [Cy] appeared on conference proceedings.

Analysis and design of time-critical applications   In time-critical applications (such as in avionics, automotive, etc.), it is necessary to guarantee at design time precise temporal constraints.

My contributions within this area are mostly into the derivation of tighter guarantee test. I also proposed a standardized procedure to measure the quality of guarantee tests.

[J1]. Lucia Lo Bello, Enrico Bini, Gaetano Patti. "Priority-driven Swapping-based Scheduling of Aperiodic Real-Time Messages over EtherCAT Networks", *IEEE Transactions on Industrial Informatics* 11(3):741–751, June 2015.
DOI: 10.1109/TII.2014.2350832

[J2]. Enrico Bini. "The Quadratic Utilization Upper Bound for Arbitrary Deadline Real-Time Tasks" *IEEE Transactions on Computers*, 64(2):593–599, February 2015.
DOI: 10.1109/TC.2013.209

[J3]. Thi Huyen Châu Nguyen, Pascal Richard, and Enrico Bini. "Approximation techniques for response-time analysis of static-priority tasks" *Real-Time Systems*, 43(2):147–176, October 2009.
DOI: 10.1007/s11241-009-9078-5

[J4]. Enrico Bini, Thi Huyen Châu Nguyen, Pascal Richard, and Sanjoy Baruah. "A response time bound in fixed-priority scheduling with arbitrary deadlines" *IEEE Transactions on Computers*, 58(2):279–286, February 2009.
DOI: 10.1109/TC.2008.167
(12th most cited among the 138 papers appeared in IEEE TC 2009)

[J5]. Enrico Bini and Giorgio C. Buttazzo. "The space of EDF deadlines: the exact region and a convex approximation" *Real-Time Systems*, 41(1):27–51, January 2009.
DOI: 10.1007/s11241-008-9060-7

[J6]. Enrico Bini and Giorgio C. Buttazzo. "Measuring the performance of schedulability tests" *Real-Time Systems*, 30(1–2):129–154, May 2005.
DOI: 10.1007/s11241-005-0507-9
(**most cited** among the 25 papers appeared in RTS 2005)

[J7]. Enrico Bini and Giorgio C. Buttazzo. "Schedulability analysis of periodic fixed priority systems" *IEEE Transactions on Computers*, 53(11):1462–1473, November 2004.
DOI: 10.1109/TC.2004.103
(10th most cited among the 137 papers appeared in IEEE TC 2004)

[J8]. Enrico Bini, Giorgio C. Buttazzo, and Giuseppe M. Buttazzo. "Rate monotonic scheduling: The hyperbolic bound" *IEEE Transactions on Computers*, 52(7):933–942, July 2003.
DOI: 10.1109/TC.2003.1214341
(14th most cited among the 148 papers appeared in IEEE TC 2003)

[C1]. Enrico Bini, Andrea Parri, Giacomo Dossena. "A Quadratic-Time Response Time Upper Bound with a Tightness Property", *Proceedings of the 36th IEEE Real-Time Systems Symposium*, San Antonio, TX, USA, December 2015.
DOI: 10.1109/RTSS.2015.9

[C2]. Artem Burmyakov, Enrico Bini, Eduardo Tovar. "An Exact Schedulability Test for Global FP Using State Space Pruning", *Proceedings of the 23rd International Conference on Real-Time Networks and Systems*, Lille, France, November 2015.
DOI: 10.1145/2834848.2834877

[C3]. Giorgio C. Buttazzo, Enrico Bini, Darren Buttle. "Rate-Adaptive Tasks: Model, Analysis, and Design Issues" *Design, Automation and Test in Europe (DATE) Conference*, Dresden, Germany, March 2014.
DOI: 10.7873/DATE2014.266

[C4]. Enrico Bini. "Modeling Preemptive EDF and FP by Integer Variables". *Proceedings of the 4th Multidisciplinary International Scheduling Conference*, Dublin, Ireland, August 2009.

[C5]. Thi Huyen Châu Nguyen, Pascal Richard, and Enrico Bini. "Improved approximate response time bounds for static-priority tasks" *Proceedings of the 16th International Conference on Real-Time and Network Systems*, Nantes, France, October 2008.

[C6]. Cesare Bartolini, Enrico Bini, and Giuseppe Lipari. "Slack-based sensitivity analysis for EDF" *14th IEEE Real-Time and Embedded Technology and Applications Symposium, Work-in-Progress session*, St. Louis, MO, USA, April 2008.

[C7]. Enrico Bini. "Uniprocessor EDF feasibility is an integer problem" *Proceedings of Dagsthul Seminar on Scheduling*, Schloss Dagstuhl — Leibniz-Zentrum fuer Informatik, Germany, February 2008.

[C8]. Enrico Bini and Giorgio C. Buttazzo. "The space of EDF feasible deadlines" *Proceedings of the 19th Euromicro Conference on Real-Time Systems*, Pisa, Italy, July 2007.
DOI: 10.1109/ECRTS.2007.35

[C9]. Sanjoy Baruah, Enrico Bini, Thi Huyen Châu Nguyen, and Pascal Richard. "Continuity and approximability of response time bounds" *19th Euromicro Conference on Real-Time Systems, Work-in-Progress session*, Pisa, Italy, July 2007.

[C10]. Enrico Bini and Sanjoy K. Baruah. "Efficient computation of response time bounds under fixed-priority scheduling" *Proceedings of the 15th conference on Real-Time and Network Systems*, Nancy, France, March 2007.
(**best paper award**)

[C11]. Enrico Bini, Marco Di Natale, and Giorgio C. Buttazzo. "Sensitivity analysis for fixed-priority real-time systems" *Proceedings of the 18th Euromicro Conference on Real-Time Systems*, Dresden, Germany, July 2006.
DOI: 10.1109/ECRTS.2006.26
(**most cited** paper among the 27 appeared at ECRTS 2006)

[C12]. Enrico Bini and Giorgio C. Buttazzo. "Biasing effects in schedulability measures" *Proceedings of the 16th Euromicro Conference on Real-Time Systems*, Catania, Italy, June 2004.
DOI: 10.1109/EMRTS.2004.1311021
(**most cited** paper among the 27 appeared at ECRTS 2004)

[C13]. Enrico Bini and Giorgio C. Buttazzo. "The space of rate monotonic schedulability" *Proceedings of the 23rd IEEE Real-Time Systems Symposium*, Austin, TX, USA, December 2002.
DOI: 10.1109/REAL.2002.1181572

[C14]. Enrico Bini, Giuseppe Lipari, and Carlo Vitucci. "Modeling event-driven real-time applications using DAGs" *22nd IEEE Real-Time Systems Symposium, Work-in-Progress session*, London, UK, December 2001.

[C15]. Enrico Bini, Giorgio C. Buttazzo, and Giuseppe M. Buttazzo. "A hyperbolic bound for the rate monotonic algorithm" *Proceedings of the 13th Euromicro Conference on Real-Time Systems*, Delft, The Nederlands, June 2001.
DOI: 10.1109/EMRTS.2001.934000
(3rd most cited paper among the 27 appeared at ECTRS 2001)

Resource management on single-core, distributed, multi-core systems   When many applications co-exist over the same execution platform, it is necessary to properly assign and manage the available resources. A careful allocation policy is of great importance in environments characterized by scarce resource availability (e.g. embedded systems) or in the need of reducing power consumption (e.g. data centers, battery-operated devices).

Resource management can occur at design-time (when the application is fully characterized) and/or at run-time (when the number ond type of applications may vary). My contributions in the design-time resource management were mostly in modeling the resource management problem as an optimization problem and then in applying specialized techniques to solve it. In the run-time resource management, my contributions are in the design and implementation of feedback mechanism to monitor and possibly adjust the allocated resources.

[J9]. Georgios Chasparis, Martina Maggio, Enrico Bini, Karl-Erik Årzén. "Design and Implementation of Game-Theoretic Resource Management for Time Sensitive Applications", *Automatica* 64:44–53, February 2016.
DOI: 10.1016/j.automatica.2015.09.015

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[C17]. Martina Maggio, Juri Lelli, Enrico Bini. "A Tool for Measuring Supply Functions of Execution Platforms" *Proceedings of the 22nd IEEE International Conference on Embedded and Real-Time Computing Systems and Applications*, Daegu, South Korea, August 2016.
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[C27]. Giorgio Buttazzo, Enrico Bini, Yifan Wu. "Heuristics for Partitioning Parallel Applications on Virtual Multiprocessors" *Workshop on Adaptive Resource Management*, Stockholm, April, 2010.

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Cyber-Physical Systems   As embedded systems interact more and more with the surrounding environment, an efficient design of computing elements cannot neglect the physical interactions between devices and environment. This originated the so-called Cyber-Physical Systems (CPS), in which a holistic design must address computation, communication, and control.

My contributions in this area are mostly into the design of digital control systems with awareness of the underlying physical constraints of the execution platform.

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DOI: 10.1109/TC.2015.2435789

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[C40]. Manel Velasco, Pau Martí, Enrico Bini. "Optimal-Sampling-inspired Self-Triggered Control", *Proceedings of the 1st IEEE International Conference on Event-Based Control, Communication, and Signal Processing*, Krakow, Poland, July 2015.
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[C45]. Stefano Fontanelli, Enrico Bini, Paolo Santi. "Dynamic Route Planning in Vehicular Networks based on Future Travel Estimation" *Proceedings of the 2nd IEEE Vehicular Networking Conference*, Jersey City, NJ, USA, December 2010.
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[C46]. Manel Velasco, Pau Martí, Enrico Bini. "On Lyapunov Sampling for Event-driven Controllers", *Proceedings of the 48th IEEE Conference on Decision and Control*, Shanghai, China, December 2009.
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(11th most cited paper among 1428 appeared at CDC 2009)

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DOI: 10.1109/RTSS.2008.45
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DOI: 10.1109/RTSS.2008.29
(5th most cited paper among the 47 appeared at RTSS 2008)

Composition of real-time systems A key design principle in engineering is the modular design: several components are designed in isolation and then are composed. If applications have real-time constraints, it is necessary that their temporal properties are preserved also after the integration phase.

Within this area, I have proposed abstractions of real-time applications, both for single core and for multi-core and distributed platforms. The proposed abstractions present different degree of accuracy vs. simplicity.

[J19]. Artem Burmyakov, Enrico Bini, Eduardo Tovar. "Compositional Multiprocessor Scheduling: the GMPR interface" *Real-Time Systems*, 50(3):342–376, May 2014.
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[C56]. Nicola Serreli, Giuseppe Lipari, Enrico Bini. "The Demand Bound Function Interface of Distributed Sporadic Pipelines of Tasks Scheduled by EDF" *Proceedings of the 22nd Euromicro Conference on Real-Time Systems*, Bruxelles, Belgium, July 2010.
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[C57]. Enrico Bini, Marko Bertogna, Sanjoy K. Baruah. "The Parallel Supply Function Abstraction for a Virtual Multiprocessor" *Proceedings of Dagsthul Seminar on Scheduling*, Schloss Dagstuhl — Leibniz-Zentrum fuer Informatik, Germany, May 2010.

[C58]. Enrico Bini, Marko Bertogna, Sanjoy Baruah. "Virtual Multiprocessor Platforms: Specification and Use" *Proceedings of the 30th IEEE Real-Time Systems Symposium*, Washington, DC, USA, December 2009.
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[C59]. Nicola Serreli, Giuseppe Lipari, Enrico Bini. "Deadline assignment for component-based analysis of real-time transactions" *2nd Workshop on Compositional Real-Time Systems*, DC, USA, December, 2009.

[C60]. Enrico Bini, Giorgio C. Buttazzo, Marko Bertogna. "The Multi Supply Function Abstraction for Multiprocessors" *Proceedings of the 15th IEEE International Conference on Embedded and Real-Time Computing Systems and Applications*, Beijing, China, August 2009.
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(**best-paper award**)

[C61]. José L. Lorente, Giuseppe Lipari, and Enrico Bini. "A hierarchical scheduling model for component-based real-time systems" *Proceedings of the 20th IEEE International Parallel and Distributed Processing Symposium*, Rhodes Island, Greece, April 2006.
DOI: 10.1109/IPDPS.2006.1639405

[C62]. Giuseppe Lipari and Enrico Bini. "Resource partitioning among real-time applications" *Proceedings of the 15th Euromicro Conference on Real-Time Systems*, Porto, Portugal, July 2003.
DOI: 10.1109/EMRTS.2003.1212738
(**most cited** paper among the 33 appeared in ECRTS 2003)

Power-aware CPU scheduling in embedded systems   With the increased attention to save natural resources, great attention was directed to the reduction of energy savings, in all areas. In embedded systems with real-time constraints, the challenge is to deliver the application results with the specified temporal constraints.

    Within this area I have developed CPU scheduling techniques, which are capable to minimize the energy consumed by a CPU, without violating the temporal constraints by the application.

[J22]. Enrico Bini and Claudio Scordino. "Optimal two-level speed assignment for real-time systems" *International Journal of Embedded Systems*, 4(2):101–111, July 2009.
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[J23]. Enrico Bini, Giorgio Buttazzo, and Giuseppe Lipari. "Minimizing CPU Energy in Real-Time Systems with Discrete Speed Management" *ACM Transactions on Embedded Computing Systems*, 8(4), July 2009.
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[C63]. Tullio Facchinetti, Enrico Bini, Marko Bertogna. "Reducing the Peak Power through Real-Time Scheduling Techniques in Cyber-Physical Energy Systems" *First International Workshop on Energy Aware Design and Analysis of Cyber Physical Systems*, Stockholm, April, 2010.

[C64]. Claudio Scordino and Enrico Bini. "Optimal speed assignment for probabilistic execution times" *2nd Workshop on Power-Aware Real-Time Computing*, Jersey City, NJ, USA, September 2005.

[C65]. Enrico Bini, Giorgio C. Buttazzo, and Giuseppe Lipari. "Speed modulation in energy-aware real-time systems" *Proceedings of the 17th Euromicro Conference on Real-Time Systems*, Palma de Mallorca, Spain, July 2005.
DOI: 10.1109/ECRTS.2005.29

Relevant institutional services

1998 Elected representative of the undergraduate students in the highest board of the Scuola Superiore Sant'Anna ("Consiglio Direttivo");

2002 Elected representative of the PhD students in the highest board of the Scuola Superiore Sant'Anna ("Consiglio Direttivo");

2011–14 Elected representative of the researchers in the Ethical Committee of the Scuola Superiore Sant'Anna;

2012–today Member of the PhD board of the department (Istituto di Tecnologie della Comunicazione, dell'Informazione e della Percezione).

2015-16 Responsible of the TeCIP Department (`http://tecip.sssup.it`) at Scuola Superiore Sant'Anna for the National Evaluation of Research (VQR 2011–14), Computer Engineering area.

Volunteering

2006–2007 (Associazione Dialogo) Teaching basics of office software, computer architecture and networking to inmates in Porto Azzurro prison.

2015 ("Programma il futuro", initiative by the Italian ministry) Teacher of basic principles of programming for primary school pupils.