

1. PERSONAL DATA

- Name: Thomas Nolte
- Date of birth: 1977-05-23
- Work address: Mälardalen University, P.O. Box 883, SE-72123, Västerås, SWEDEN
- Phone number work: +46 73 6620583
- E-mail address: thomas.nolte@mdh.se
- Language skills: Swedish, English, Italian, German, (some) Spanish.

2. EMPLOYMENTS

- Professor of Computer Science, Mälardalen University, since January 2012.
- Postdoctoral Research Fellow (Forskarassistent), Mälardalen University, January 2008 – December 2011.
- Postdoctoral Researcher, Mälardalen University, February 2006 – December 2007.
- Postdoctoral Researcher, University of Catania, Italy, February – August 2006.
- Visiting Researcher, University of Catania, Italy, September – October 2005.
- Visiting Researcher, University of California, Irvine, USA, February – July 2002.
- PhD Student, Mälardalen University, November 2000 – January 2006.

3. EDUCATION

- Docent of Computer Science, Mälardalen University, since February 2009. Docent lecture title: *Hierarchical Scheduling for Embedded Systems*.
- Doctor of Philosophy in Computer Science and Engineering, Mälardalen University, May 2006. Thesis title: *Share-Driven Scheduling of Embedded Networks*. Supervisors: Prof. Hans Hansson (principal supervisor), Prof. Christer Norström, and Prof. Sasikumar Punnekkat.
- Licentiate of Engineering in Computer Science, Mälardalen University, May 2003. Thesis title: *Reducing Pessimism and Increasing Flexibility in the Controller Area Network*. Supervisors: Prof. Hans Hansson (principal supervisor), Prof. Christer Norström, and Prof. Sasikumar Punnekkat.
- Master of Science with a Major in Computer Engineering with Specialisation in Real-Time Systems, Mälardalen University, November 2002. Thesis title: *Reducing Pessimism in CAN Response Time Analysis*. Supervisor: Prof. Christer Norström.
- Bachelor of Science in Computer Engineering (Högskoleingenjörsexamen), Mälardalen University, December 2000. Thesis title: *Java MMI Real-Time Performance in VxWorks*. Supervisor: Prof. Christer Norström.

4. FUNDING RESOURCES

During my years as a PhD student (2000 – 2006) I was funded by SSF through the RATAD and SAVE projects, and by Mälardalen University through teaching activities and appointments. SSF also funded my postdoc through the SAVE++ (2006 – 2008) and PROGRESS (2006 – 2011) projects. For my international postdoc I received funding from the ARTIST2 European Network of Excellence for 6 months during 2006.

I submitted my first own research project proposal in 2007 and have since then been principal applicant of 4 funded research projects: HISCORE (2008 – 2011), START (2011 – 2013), PRESS (2011 – 2015), and PPMsched (2012 – 2014) and co-applicant of one funded research project: ARROWS (2009 – 2012). In 2011 we applied for PREMISE (2012 – 2017), covering for the salary of one Professor in my research group.

4.1. Funding from research councils

- START – Stochastic Real-Time Analysis of Embedded Software Systems, the Swedish Research Council (VR), *Project Research Grant*, 2011 – 2013, 2.400 kSEK. Dr. Thomas Nolte is the principal (and only) applicant of START.
- ARROWS – Design Techniques for Adaptive Embedded Systems, the Swedish Research Council (VR), *Multi-Project Grant*, 2009 – 2012, 12.156 kSEK. Dr. Thomas Nolte is co-applicant of ARROWS, together with Prof. Hans Hansson (principal applicant), Prof. Paul Pettersson, Prof. Kristina Lundqvist, and Dr. Cristina Seceleanu.
- HISCORE – Hierarchical Scheduling of Complex Real-Time Embedded Systems, the Swedish Research Council (VR), *Junior Research Position Grant*, 2008 – 2011, 4.124 kSEK. Dr. Thomas Nolte is the principal (and only) applicant of HISCORE.

4.2. Funding from foundations

- PPMsched – Performance Preserving Multicore Scheduling, the Knowledge Foundation (KKS), *HÖG 11 Project Grant*, 2012 – 2014, 4.455 kSEK. Dr. Thomas Nolte is principal applicant of PPMsched, and Prof. Mikael Sjödin is co-applicant.
- PREMISE – Predictable Multicore Systems, the Knowledge Foundation (KKS), *Strategic Recruitment*, 2012 – 2017, 4.800 kSEK. Prof. Hans Hansson is the principal applicant of PREMISE.
- PRESS – Predictable Embedded Software Systems, the Swedish Foundation for Strategic Research (SSF), *Individual Grant for Future Research Leaders*, 2011 – 2015, 10.000 kSEK. Dr. Thomas Nolte is the principal (and only) applicant of PRESS.
- PROGRESS – The PROGRESS Centre for Predictable Embedded Software Systems, the Swedish Foundation for Strategic Research (SSF), *Strategic Research Centre Grant*, 2006 – 2011, 49.000 kSEK. Prof. Hans Hansson is the principal applicant of PROGRESS.
- SAVE++ – Continuation of SAVE, the Swedish Foundation for Strategic Research (SSF), 2006 – 2008, 9.500 kSEK. Prof. Hans Hansson is the principal applicant of SAVE++.
- SAVE – Component Based Design of Safety Critical Vehicular Systems, the Swedish Foundation for Strategic Research (SSF), 2003 – 2005, 17.000 kSEK. Prof. Hans Hansson is the principal applicant of SAVE.
- RATAD – Reliability and Timing Analysis of Distributed Systems, the Swedish Foundation for Strategic Research (SSF) via ARTES, 2001 – 2003, 1.200 kSEK. Prof. Hans Hansson is the principal applicant of ARTES.

4.3. EU and other international funding

- ARTIST2 – European Network of Excellence on Embedded Systems Design, IST-004527, under the Adaptive Real-Time Cluster, University of Catania, Italy (2006). 6.500 k€, funded by EU. Under this project Prof. Lucia Lo Bello funded me (including salary) with a position as Visiting Researcher for 6 months at the University of Catania during 2006.

4.4. Miscellaneous sources

- The Committee for Design and Art, MDH, Grant for Vernissage and Photo Exhibition, 45 kSEK, 2009.
- ARTES Mobility Support, 10KSEK, 2001, 10 kSEK, 2003.
- ARTES Travel Grant for International Visits, 30 kSEK, 2002.
- LM Ericsson's Research Foundation, Mobility Grant, 25 kSEK, 2002.

5. RESEARCH

5.1. Research profile

Today I lead the CORE research group consisting of me and 3 additional senior researchers (Dr. Moris Behnam, Dr. Holger Kienle and Dr. Johan Kraft), and a total of 5 PhD students (Farhang Nemati, Yue Lu, Mikael Åsberg, Nima M. Khalilzad, and Daniel Hallmans), with another 4 PhD students and one post doc being recruited in 2012. All new PhD student and post doc recruitments are fully funded by research projects that have already been granted.

I have a strong international profile with multiple ongoing collaborations, including Prof. Luis Almeida (University of Porto, Portugal), Prof. Reinder J. Bril (TU/e, the Netherlands), Prof. Insik Shin (KAIST, Korea), Dr. Paulo Pedreiras (University of Aveiro, Portugal), Prof. Iain Bate (University of York, UK), Dr. Shinpei Kato (University of California, Santa Cruz, USA), Dr. Liliana Cucu-Grosjean (Nancy/INRIA, France), and Dr. Nathan Fisher (Wayne State University, USA).

I have published more than 123 peer-reviewed papers out of which 70 have international co-authors, and 10 papers with national or international industrial or research institute co-authors. All publications are available at: <http://www.mrtc.mdh.se/>. My citation count is 826 and my h-index is 15 (citation data has been collected using Google Scholar 2011-11-26).

My research profile centers around the understanding of complex embedded software systems, as well as creating predictable platforms for execution of such systems. Examples of such systems are industrial robot control systems, automation systems and telecommunication systems. These systems often consist of millions of lines of source code that have been developed and maintained by hundreds of engineers over many years. In general, systems of this size are too large and complex for any single person to understand in detail. Over the past 10 years I have conducted research in the following 8 areas related to engineering of such complex embedded systems:

1. compositional execution and analysis of real-time systems,
2. multiprocessor scheduling and synchronization,
3. predictable execution of real-time systems,
4. source code analysis for industrial embedded software,
5. simulation-based analysis of complex embedded systems,
6. stochastic and statistical analysis of real-time systems,
7. real-time communications, and
8. adaptive and reconfigurable real-time systems.

Currently, most of my research efforts are focused on 3 research challenges: i) the multicore challenge, ii) the virtualization challenge, and iii) the legacy software system analysis challenge. Below these challenges are outlined in more detail together with some of our¹ key results.

The multicore challenge: Most existing industrial software systems (legacy systems) are constructed for single-core architectures. However, there is a trend among chip-providers towards having only multicore architectures in their portfolio. Hence, industry is facing a situation where new software systems have to be developed for multicore architectures, and existing software systems have to be moved to (migrated to) new multicore architectures. Facing this situation, a number of challenges inherent in the parallelism of the multicore architectures become apparent, including previously insignificant hardware effects related to shared busses and memory access. Our key results include:

- Migration to multiprocessors: We have developed techniques for migration of industrial software systems to new multicore platforms. These techniques allow an engineer to give weight to certain cost-related features of the legacy system, to minimize overall system cost.

¹all listed research results are either my own or research results that I have been actively involved in and also co-authored the resulting published research papers

- Multicore and synchronization: We have developed solutions for synchronization on multiprocessors, for regular real-time systems and for (open) real-time systems consisting of (possibly) independently developed subsystems.

The virtualization challenge: In dealing with the complex nature of future hardware architectures as well as issues inherent in integration of multiple software systems on the same hardware platform, we work on platform virtualization (virtualization of CPU and network). Our vision is to allow for the co-existence of heterogenous systems with mixed criticalities on the same hardware platform. Our key results include:

- Hierarchical scheduling and synchronization: We have developed a synchronization protocol and corresponding real-time analysis allowing for mutual exclusive resource access in two-level hierarchically scheduled real-time systems for single processors.
- Hierarchical scheduling and implementation: We have implemented hierarchical scheduling and synchronization protocols in several operating systems, e.g., VxWorks and Linux, and we have integrated hierarchical scheduling in AUTOSAR for automotive applications.
- Early prototyping and verification of hierarchically scheduled systems: We have developed approaches for early prototyping, and formal verification and synthesis of hierarchically scheduled systems, allowing for correct-by-construction development using VxWorks.
- Compositional communications: We have developed hierarchical scheduling techniques for Switched Ethernet networks and CAN networks. We have implemented and demonstrated these techniques in a fully operational Ethernet Switch, and we have developed corresponding timing analysis.

The legacy software system analysis challenge: Many industrial legacy software systems are large and complex, consisting of millions of lines of source code. For such systems traditional academic analysis models do not naturally apply, mainly due to their simplifying assumptions. As a response to this we have developed several techniques for analysis of industrial legacy systems based on trace recording, simulation and statistical methods for timing analysis. Our key results include:

- RTSSim simulation framework: We have developed a framework (RTSSim) for simulation-based timing analysis, targeting complex embedded systems. RTSSim allows for simulating embedded software with approximate timing data based on real system measurements.
- Simulation optimization: Using RTSSim we have analyzed several simulation optimization techniques for finding extreme case timing more efficiently compared to what is possible using traditional simulation techniques such as Monte-Carlo simulation.
- Statistical methods for timing analysis: We have investigated the use of statistical methods, particularly extreme value theory, for analyzing traces of both simulations and traces collected from runtime systems for the purpose of timing analysis.

6. SUPERVISION EXPERIENCE

I have taken a course in supervision of doctoral students.

- "Utbildning för handledare inom utbildningen på forskarnivå", course in supervision of PhD students for supervisors, Karlstad University, Mälardalen University, Dalarna University and University of Gävle, 3x2 days 2007 – 2008.

6.1. Supervision of doctoral students

As principal supervisor I have supervised:

- Dr. Moris Behnam who successfully defended his PhD Thesis "Synchronization Protocols for a Compositional Real-Time Scheduling Framework" in November 2010, (assistant supervisor: Prof. Mikael Sjödin)
- Lic. Yue Lu who successfully presented his Licentiate Thesis "Approximation Techniques for Timing Analysis of Complex Real-Time Embedded Systems" in October 2010, (assistant supervisors: Prof. Christer Norström and Dr. Anders Wall)
- Lic. Farhang Nemati who successfully presented his Licentiate Thesis "Partitioned Scheduling of Real-Time Tasks on Multi-core Platforms" in May 2010. (assistant supervisors: Prof. Christer Norström and Dr. Anders Wall)

As assistant supervisor I have supervised:

- Dr. Johan Fredriksson who successfully defended his PhD Thesis "Improving Predictability and Resource Utilization in Component-Based Embedded Real-Time Systems" in October 2008, (principal supervisor: Prof. Ivica Crncovic)
- Dr. Moris Behnam who successfully presented his Licentiate Thesis "Hierarchical Real-Time Scheduling and Synchronization" in October 2008. (principal supervisor: Prof. Mikael Sjödin)

Currently I am the principal supervisor of 5 PhD students:

- Daniel Hallmans, since October 2011, Lic. planned 2014, PhD planned 2017, (assistant supervisor: Dr. Stig Larsson)
- Nima M. Khalilzad, since May 2011, Lic. planned 2013, PhD planned 2015, (assistant supervisor: Dr. Moris Behnam)
- Lic. Yue Lu, since January 2010, Lic. October 2010, PhD planned 2012, (assistant supervisors: Prof. Christer Norström and Dr. Anders Wall)
- Lic. Farhang Nemati, since November 2008, Lic. May 2010, PhD planned 2012, (assistant supervisors: Prof. Christer Norström and Dr. Anders Wall)
- Mikael Åsberg, since October 2008, Lic. planned 2011, PhD planned 2013. (assistant supervisor: Prof. Hans Hansson)

Additionally, I am assistant supervisor of one PhD student:

- Hang Yin, since September 2010, Lic. planned 2012, PhD planned 2015. (principal supervisor: Prof. Hans Hansson)

Finally, I am recruiting another 4 PhD students in 2012.

6.2. Other supervision

I am supervising master and bachelor students during their thesis projects². Some of these thesis projects have resulted in peer-reviewed publications at international conferences.

A selection of recent completed master thesis projects include:

- Nima M. Khalilzad (now PhD student at MDH), Title: "Hierarchical Scheduling and Feedback Control", 2011, Supervisor Dr. Moris Behnam, Examiner Dr. Thomas Nolte.
- Farahnaz Yekeh (now PhD student at Luleå University), Title: "Hierarchical Server-Based Communication with Switched Ethernet", 2010, Supervisors Dr. Thomas Nolte and Prof. Luis Almeida (University of Porto, Portugal), Examiner Dr. Thomas Nolte.
- Kathrin Dannmann (now PhD student at KTH), Title: "Synthesizing Real-Time Components to Run-Time Tasks", 2009, Supervisor Dr. Thomas Nolte, Examiners Dr. Thomas Nolte and Prof. Dr. Martin Fränzle (University of Oldenburg, Germany).
- Mikael Åsberg (now PhD student at MDH), Title: "On Hierarchical Scheduling in VxWorks", 2008, Supervisor Dr. Moris Behnam, Examiner Dr. Thomas Nolte.

7. LEADERSHIP AND MANAGEMENT

7.1. International undertakings

- Chair (elected 2 year position) of the IEEE Industrial Electronics Society (IES) Technical Committee on Factory Automation (TCFA), since January 2012.
<http://www.iestcfa.org/>
- Vice Chair (elected 2 year position) of the IEEE IES TCFA, January 2010 – December 2011.
<http://www.iestcfa.org/>
- Co-chair of the Real-Time Fault Tolerant Systems Subcommittee of the IEEE IES TCFA, since January 2008.
<http://www.iestcfa.org/>

7.2. Experience of leading units

- Leader of the Complex Real-Time Embedded Systems (CORE) research group (currently 4 PhD researchers and 5 PhD students³) at Mälardalen Real-Time Research Centre (MRTC), since April 2010.
<http://www.mrtc.mdh.se>
- Leader of the HISCORE research group (2 PhD researchers and 4 PhD students) at MRTC, January 2008 – March 2010.
<http://www.mrtc.mdh.se>
- Program Leader of the PROGRESS Research Centre (14 research projects, ~35 persons), July 2007 – December 2012.
<http://www.mrtc.mdh.se/progress/>
- Leader of the Systems Design Laboratory (~30 persons) at the Department of Computer Science and Electronics, Mälardalen University, September 2006 – August 2007.
<http://www.mrtc.mdh.se/index.php?choice=labs&id=0003>

²for an up to date list of thesis projects, please look at <http://www.mrtc.mdh.se/index.php?choice=staff&id=0099>

³another 3 PhD students are being recruited in 2011

7.3. Membership of boards and committees in higher education institutions

- Director of Graduate Studies at the School of Innovation, Design and Engineering, Mälardalen University, since January 2011.
- Member of the Committee for Post Graduate Education of the Faculty Board, Mälardalen University, since January 2011.
- Member of the Graduate Education Committee of the Faculty Board for Natural Sciences and Engineering, Mälardalen University, October 2004 – December 2010.
- Member of Genusforum, Mälardalen University, January 2004 – December 2006.

7.4. Other professional administrative duties

- President (elected) of SNART – The Swedish National Real-Time Association, since October 2008.

The Swedish National Real-Time Association (SNART) is a non-profit organisation for academic researchers, students and industrial practitioners, which are active or interested in real-time or embedded SW systems.

SNART has the goals to: (1) increase the interest for conducting research in the area, (2) improve the interaction between academia and industry, (3) stimulate continuous competence development in industry, (4) actively work for increased funding for research and thereby support improved national education in the area, and (5) distribute information and arrange workshops and conferences.

SNART was the main organisation behind the ARTES initiative in 1996 – 2007. ARTES was a national Swedish strategic research initiative in Real-Time Systems supported by the Swedish Foundation for Strategic Research (SSF).

<http://www.snart.org/>

- PhD Student Ombudsman (doktorandombud) for all PhD students (~200 persons) at Mälardalen University, July 2003 – June 2005.
- Chair of the PhD Student Council (ordförande i doktorandrdet) at Mälardalen University, July 2003 – June 2005.
- Adjunct Member of Sveriges Förenade Studentkårer (SFS)⁴ doktorandkommitté, SFS, Stockholm, October 2003 – June 2005.
- Thesis Coordinator (Bachelor and Master Theses) at the Department of Computer Science and Electronics, Mälardalen University, October 2002 – June 2006.

7.5. Leadership courses taken

- "Ledarskap genom personlig utveckling - LPU", leadership through personal development, IFL, Handelshögskolan, Stockholm, 3x4 + 1x3 + 4x1 days, January – October 2009.
- "DUX M", leadership program, Örebro University and Mälardalen University, 4x1 day 2007.
- "Utveckla ditt ledarskap", leadership course, Mälardalen University, 1 week, May 2005.

⁴the national student union organization of Sweden

8. COMMUNITY SERVICES

8.1. International community services

I am very active in the international research community.

I have organized (and am organizing) a number of international symposia, conferences and workshops: I have been (or am) part the organization (General Chair, Organizer, Program Chair, Publicity Chair, Session Chair, and PC-Member) for 86 international symposia, conferences and workshops, including being General Chair and/or Organizer 6 times, Program Chair of 10 technical program committees and PC-Member of more than 61 technical program committees (including all international top events in real-time systems: RTSS, ECRTS, RTAS and RTCSA, and factory automation: ETFA, SIES and WFCS). Moreover, I am Editorial Board Member of JSA and I have organized 4 special sections in TII.

I have presented more than 30 scientific papers at international symposia, conferences and workshops.

I have attended virtually all events where I have publications, and a number of events where I do not have any own publication.

My activities are outlined and summarized below⁵:

8.1.1. Memberships

I am

- Senior Member⁶ of IEEE
- Member of IEEE Computer Society (CS)
- Member of IEEE Industrial Electronics Society (IES)
- Member of IEEE CS Technical Committee on Real-Time Systems (TCRTS)
- Chair of the IEEE IES Technical Committee on Factory Automation (TCFA)

8.1.2. Editorial Board Memberships

I am/have been

- Editorial Board Member of Elsevier's Journal of Systems Architecture (JSA): Embedded Software Design, since 2009.
- Guest Editor, IEEE Transactions on Industrial Informatics (TII), Special Section on "Real-Time and (Networked) Embedded Systems", 2010.
- Guest Editor, IEEE TII, Special Section on "Real-Time and (Networked) Embedded Systems", 2009.
- Guest Editor, IEEE TII, Special Section on "Real-Time and (Networked) Embedded Systems", 2008.
- Guest Editor, IEEE TII, Special Section on "Component Models for Embedded Systems", 2008.

8.1.3. General Chair

I have been General Chair of

- SIES'11 – IEEE International Symposium on Industrial Embedded Systems 2011 – co-chair with Prof. Richard Zurawski.

⁵alphabetical order based on conference and workshop abbreviation

⁶I was successfully evaluated as Senior Member of IEEE in 2011: I have been active in IEEE since 2001

8.1.4. Organizer

I have been Organizer 6 times for 3 different international symposia and workshops

- COMES'08 – PROGRESS Workshop on Component Models for Embedded Systems, 2008 – co-organized with Prof. Ivica Crnkovic and Prof. Hans Hansson.
- CRTS'08⁷'09'10'11 – Workshop on Compositional Theory and Technology for Real-Time Embedded Systems, 2008, 2009, 2010 and 2011 – co-organized with Dr. Insik Shin, Prof. Insup Lee, and Prof. Oleg Sokolsky. (co-located with IEEE Real-Time Systems Symposium (RTSS), 2008, 2009, 2010 and 2011)
- SIES'11 – IEEE International Symposium on Industrial Embedded Systems 2011 – co-organized with Prof. Hans Hansson.

8.1.5. Program Chair

I am/have been Program Chair 10 times for 5 different international symposia, conferences and workshops

- EMC'10 – International Conference on Embedded and Multimedia Computing, the Real-Time Track, 2010.
- ETFA'12 – IEEE International Conference on Emerging Technologies and Factory Automation, the whole conference, 2012 – co-chair with Prof. Boghdan Cyganek.
- ETFA'08'09'10'11 – IEEE International Conference on Emerging Technologies and Factory Automation, the Real-Time and (Networked) Embedded Systems track, 2008, 2009, 2010, and 2011 – co-chair with Prof. Roberto Passerone (2008 – 2010) and Prof. Joël Goossens (2011).
- RTCSA WIP'10 – IEEE International Conference on Embedded and Real-Time Computing Systems and Applications, the Work-in-Progress (WIP) track, 2010.
- SIES'12 – IEEE International Symposium on Industrial Embedded Systems 2012 – co-chair with Prof. Samarjit Chakraborty.
- WFCS'12 – IEEE International Workshop on Factory Communication Systems 2012, the whole conference – co-chair with Prof. Andreas Willig.
- WFCS WIP'08 – IEEE International Workshop on Factory Communication Systems, the Work-in-Progress (WIP) track, 2008 – co-chair with Dr. Nicolas Navet.

8.1.6. Publicity Chair

I am/have been Publicity Chair 10 times for 8 different international symposia, conferences and workshops

- CPSNA'11 – International Workshop on Cyber-Physical Systems, Networks, and Applications, 2011.
- GreenCom'11 – IEEE/ACM International Conference on Green Computing and Communications, 2011.
- ICCPS'11 – ACM/IEEE Second International Conference on Cyber-Physical Systems, 2011.
- RTAS'09 – IEEE Real-Time and Embedded Technology and Applications Symposium, 2009.
- RTCSA'09'10'12 – IEEE International Conference on Embedded and Real-Time Computing Systems and Applications, 2009, 2010, and 2012.
- RTSS'11 – IEEE Real-Time Systems Symposium, 2011.
- SEAA-ESE'11 – EUROMICRO Conference on Software Engineering and Advanced Applications, the Embedded Software Engineering (ESE) Track, 2011.
- SIES'10 – IEEE International Symposium on Industrial Embedded Systems, 2010.

⁷CRTS was founded by me and Prof. Insik Shin in 2008

8.1.7. PC-Member

I am/have been PC-Member of 61 technical program committees for 30 different international symposia, conferences and workshops, including all top events in *(i)* real-time systems: IEEE Real-Time Systems Symposium (RTSS), EUROMICRO Conference on Real-Time Systems (ECRTS), IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS), and RTCSA, and *(ii)* factory automation: ETFA and WFCS.

- AMICS'11, – IEEE Workshop on Architectures and Applications for Mixed-Criticality Systems, 2011.
- APRES'08'09'11'12, – Workshop on Adaptive and Reconfigurable Embedded Systems, 2008, 2009, 2011 and 2012.
- CORCS'08'09'11, – IEEE International Workshop on Component-Based Design of Resource-Constrained Systems, 2008, 2009, and 2011.
- CPNS'11 – International Workshop on Cyber-Physical Networking Systems, 2011.
- CPSNA'11, – International Workshop on Cyber-Physical Systems, Networks, and Applications, 2011.
- CSE'09'10, – IEEE International Conference on Computational Science and Engineering, 2009, and 2010.
- ECRTS'10'11'12, – EUROMICRO Conference on Real-Time Systems, 2010, 2011, and 2012.
- ECRTS WIP'09, – EUROMICRO Conference on Real-Time Systems, 2009.
- ESA'11 – IEEE International Symposium on Advanced Topics on Embedded Systems and Applications, 2011.
- ESTIMedia'11 – IEEE/ACM Symposium on Embedded Systems for Real-Time Multimedia, 2011.
- ETFA'06'07, – IEEE International Conference on Emerging Technologies and Factory Automation, 2006, and 2007.
- EUC'09'10'11, – IEEE/IFIP International Conference on Embedded and Ubiquitous Computing, 2009, 2010, and 2011.
- ICECCS'12 – IEEE International Conference on Engineering of Complex Computer Systems, 2012.
- ICESS'10'11, – IEEE International Conference on Embedded Software and Systems, 2010, and 2011.
- M-BED'11, – Workshop on Model Based Engineering for Embedded Systems Design, 2011.
- RACS'11, – 2011 Research in Applied Computation Symposium, 2011.
- RACS'10, – International Conference on Reliable & Autonomous Computational Science, 2010.
- RTAS'11'12, – IEEE Real-Time and Embedded Technology and Applications Symposium, 2011, and 2012.
- RTAS WIP'06, – IEEE Real-Time and Embedded Technology and Applications Symposium, 2006.
- RTCSA'07'09'10'11'12, – IEEE International Conference on Embedded and Real-Time Computing Systems and Applications, 2007, 2009, 2010, 2011 and 2012.
- RTiS'07'09, – Real-Time in Sweden, 2007, and 2009.
- RTSOAA'11, – IEEE International Workshop on Real-Time Service-Oriented Architecture and Applications, 2011.
- RTSS'08'09'10'11, – IEEE Real-Time Systems Symposium, 2008, 2009, 2010, and 2011.
- SAC'10, – ACM Symposium on Applied Computing, 2010.
- SEAA-ESE'11'12, – EUROMICRO Conference on Software Engineering and Advanced Applications, the Embedded Software Engineering (ESE) Track, 2011, and 2012.
- SIES'07'08, – IEEE International Symposium on Industrial Embedded Systems, 2007, and 2008.
- SOCA'09'10'11, – IEEE International Conference on Service-Oriented Computing and Applications, 2009, 2010, and 2011.
- SOCNE'10'11, – IEEE International Workshop on Service Oriented Architectures in Converging Networked Environments, 2010, and 2011.
- WATERS'11, – International Workshop on Analysis Tools and Methodologies for Embedded and Real-time Systems, 2011.
- WCPS'09, – International Workshop on Cyber-Physical Systems, 2009.
- WFCS'08'10, – IEEE International Workshop on Factory Communication Systems, 2008, and 2010.
- WTR'09'10'11, – Brazilian Workshop on Real-Time and Embedded Systems, 2009, 2010, and 2011.

8.1.8. Reviewer

I have been Reviewer for hundreds of scientific papers submitted to major international journals, symposia, conferences and workshops.

I am/have been Reviewer for major international journals, including:

- ACM Transactions on Embedded Computing Systems
- Elsevier's Computer Standards and Interfaces
- Elsevier's Computers & Electrical Engineering
- Elsevier's Control Engineering Practice
- Elsevier's Journal of Systems and Software
- EUROMICRO Journal of Systems Architecture
- IEEE Micro
- IEEE Transactions on Automation Science and Engineering
- IEEE Transactions on Computers
- IEEE Transactions on Industrial Electronics
- IEEE Transactions on Industrial Informatics
- IEEE Transactions on Parallel and Distributed Systems
- Springer's Real-Time Systems

For each 61 PC-Member instances listed above the review load is in the order of $\sim 3 - 15$ papers. In addition, I have been reviewing a varying number ($1 - \sim 5$) of scientific papers for the following 46 instances of 18 different international symposia, conferences and workshops

- DATE'08'09'12 – Design, Automation and Test in Europe, 2008, 2009, and 2012.
- ECRTS'01'04'05'06'08'09 – EUROMICRO Conference on Real-Time Systems, 2001, 2004, 2005, 2006, 2008, and 2009.
- EMSOFT'04'05'06'08 – ACM/IEEE International Conference on Embedded Software, 2004, 2005, 2006, and 2008.
- ETFA'05'08'09'10 – IEEE International Conference on Emerging Technologies and Factory Automation, 2005, 2008, 2009, and 2010.
- FET'01'03'05'07'09 – IFAC International Conference on Fieldbus Systems and their Applications, 2001, 2003, 2005, 2007, and 2009.
- ICCPS'11 – ACM/IEEE Second International Conference on Cyber-Physical Systems, 2011.
- ICSE'02 – ACM/IEEE International Conference on Software Engineering, 2002.
- IECON'06 – Annual Conference of the IEEE Industrial Electronics Society, 2006.
- INCOM'04'06 – IFAC/IFIP/IFORS/IEEE Symposium on Information Control Problems in Manufacturing, 2004, and 2006.
- ISIE'09'10 – IEEE International Symposium on Industrial Electronics, 2009, and 2010.
- ISORC'05 – IEEE International Symposium on Object/component/service-oriented Real-time distributed computing, 2005.
- OPODIS'03'04 – International Conference On Principles Of Distributed Systems, 2003, and 2004.
- RTAS'04'05'06 – IEEE Real-Time and Embedded Technology and Applications Symposium, 2004, 2005, and 2006.
- RTCSA'04'05'06 – IEEE International Conference on Embedded and Real-Time Computing Systems and Applications, 2004, 2005, and 2006.
- RTN'04 – International Workshop on Real-time Networks, 2004.
- RTSS'01'02'03'07 – IEEE Real-Time Systems Symposium, 2001, 2002, 2003, and 2007.
- TACAS'08 – International Conference on Tools and Algorithms for the Construction and Analysis of Systems, 2008.
- WFCS'04'06 – IEEE International Workshop on Factory Communication Systems, 2004, and 2006.

8.1.9. Session Chair

I have been Session Chair 22 times at 10 different international symposia, conferences and workshops, including all top events in *(i)* real-time systems: IEEE Real-Time Systems Symposium (RTSS), EUROMICRO Conference on Real-Time Systems (ECRTS), IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS), and RTCSA, and *(ii)* factory automation: ETFA and WFCs.

- CPSNA'11 – International Workshop on Cyber-Physical Systems, Networks, and Applications, 2011.
- ECRTS'10 – EUROMICRO Conference on Real-Time Systems, 2010.
- EMSOFT'11 – ACM/IEEE International Conference on Embedded Software, 2011
- ERTSI'04'05 – Embedded Real-Time Systems Implementation Workshop, 2004, and 2005.
- ETFA'06'07'08'09'10'11 – IEEE International Conference on Emerging Technologies and Factory Automation, 2006, 2007, 2008, 2009, 2010, and 2011.
- ICECCS'11 – IEEE International Conference on Engineering of Complex Computer Systems, 2011.
- RTAS'10 – IEEE Real-Time and Embedded Technology and Applications Symposium, 2010.
- RTCSA'09'10'11 – IEEE International Conference on Embedded and Real-Time Computing Systems and Applications, 2009, 2010, and 2011.
- RTSS'08'09'10'11 – IEEE Real-Time Systems Symposium, 2008, 2009, 2010, 2011.
- WFCs'08'10 – IEEE International Workshop on Factory Communication Systems, 2008, and 2010.

8.1.10. Other community services

I am/have been

- Co-organiser of the maRTian task (simulated robotics competition, later renamed to CiberMouse) at RTSS, 2005. Judge in 2007.
- National services: President of SNART since 2009, Co-Organizer of Real-Time in Sweden (RTiS)'07'09'11 (co-organized with Dr. Andreas Ermedahl (2009), Dr. Anton Cervin (2010), and Dr. Dag Nyström (2011)) and Co-Organizer of the MDH Graduate Student Conference 2004 and 2005.

8.2. Appointment as doctorate/graduate committee member, opponent, examiner

I have been appointed as

- Opponent, Licentiate thesis, Jakob Rosen, "Predictable Real-Time Applications on Multiprocessor Systems-on-Chip", Linköping University, September 2011.
- Opponent, Licentiate thesis, Vanessa Romero Segovia, "Adaptive Resource Management", Lund University, September 2011.
- Member of the grading committee and "arguente", which means the person that conducts the discussion, Doctoral thesis, Rui Santos, "Enhanced Ethernet Switching Technology for Adaptive Hard Real-Time Applications", University of Aveiro, Portugal, July 2011.
- Examiner, Licentiate thesis, Jagadish Suryadevara, "Design and Analysis Support for Abstract Models of Component-based Embedded Systems", Mälardalen University, June 2011.
- Examiner, Licentiate proposal, Rafia Inam, "Towards a Predictable Component-Based Run-time System", Mälardalen University, June 2011.
- Opponent, Licentiate thesis, Kristina Kunert, "Fibre-optic AWG Networks supporting Real-Time Communication in Embedded Systems", Halmstad University, December 2008.
- Examiner, Licentiate proposal, Håkan Gustavsson, "Economical Valuation of Architectural Decisions Within the Automotive Industry", Mälardalen University, December 2007.

8.3. Invited talks

I have given Invited Talks at

- ICES Enea seminar on Optimizing Performance and Stability of Muticore Systems, "Predictable Timing on Multicore Architectures", Kista, Sweden, 2011.
- Rotary's District Conference, "Kunskap är kraft" ("knowledge is power"), Västerås, Sweden, 2011.
- UIB, "Hierarchical Real-Time Systems Integration", Palma de Mallorca, Spain, 2011.
- International Workshop on Cyber-Physical Systems, Networks, and Applications (CPSNA), "Compositionality and CPS from a Platform Perspective", Toyama, Japan, 2011.
- University of Porto, "Hierarchical Integration of Embedded Real-Time Systems", Porto, Portugal, 2011.
- TU/e, "Hierarchical Scheduling of Embedded Real-Time Systems", Eindhoven, The Netherlands, 2010.
- French Summer School on Real-Time Systems (ETR), "Hierarchical Scheduling of Complex Embedded Real-Time Systems", Paris, France, 2009.
- INRIA, Nancy, France, 2009.
- KAIST, Daejeon, South Korea, 2009.
- IEEE International Meeting on Powerline for - but not limited to - Automotive, Pavia, Italy, 2008.
- Swedish Embedded Systems Meeting (SES), Stockholm, Sweden, 2008.
- Workshop on Fieldbuses for Automotive and the Powerline Alternative, Pavia, Italy, 2008.

9. AWARDS

I have received

- SSF's Framtidens Forskningsledare⁸, the Swedish Foundation for Strategic Research (SSF): Individual Grant for Future Research Leaders, 2010.
- VR's Forskarassistenttjänst⁹, the Swedish Research Council (VR): Junior Research Position Grant, 2007.
- Best Paper Award Nomination, IEEE Real-Time Systems Symposium (RTSS), 2008.
- Best WIP-Paper Award, IEEE International Workshop on Factory Communication Systems (WFCS), 2008.
- Best Paper Award, IEEE International Conference on Embedded and Real-Time Computing Systems and Applications (RTCSA), 2007.
- First Prize from Mälardalen University for Commercially Interesting Idea, 2002.
- ALMI Innovation Västmanlands Specialpris, 2002.

⁸18 out of 160 applications were granted in 2010, and I was the only grantee in the area of embedded systems (dnr FFL09-0075).

⁹35 out of 286 applications were granted in 2007, and I was the only grantee in the area of computer science (dnr 2007-6573).