



ELLIIT Nyhetsblad 5 – Augusti 2013

Redaktör: Karl-Erik Årzén

Målet med ELLIITs bi-monthly nyhetsblad är att sprida information om händelser och nyheter från ELLIIT. Nyhetsbladet är skrivet på en blandning av svenska och engelska.

Nyheter

ELLIIT Workshop 2013

The annual ELLIIT Workshop will be held in Lund on 22-23 October, 2013. The program and registration link can be found at <http://omikron.eit.lth.se/ELLIIT/>

Halmstad Colloquium

The [Halmstad Colloquium](#) has hosted several key speakers, including [Karl Iagnemma \(MIT\)](#), [Magnus Egerstedt](#) (Georgia Tech), [Kishor Trivdi](#) (Duke), and [Gul Agha](#) (UIUC). Upcoming speakers include Manfred Broy, Christoph Mecklenbräuker and Mike Butts. All colloquium talks are recorded and are available online. To receive announcements about upcoming talks, you can sign-up to the mailing list at the colloquium website (<http://www.halmstadcolloquium.org/>).

Mobile and Pervasive Cloud Computing Institute at Lund University (MAPCI)

Lund University, Region Skåne and Sony Mobile have partnered to create a new research institute: the Mobile and Pervasive Computing Institute at Lund University (MAPCI). MAPCI will focus on distributed cloud technology – a new area combining communications and software technologies, and take on the explicit role of bridge-builder between existing mobile research centers in southern Sweden as well as with industry. The institute will be a part of Lund University, but located in the same campus as Sony Mobile and Ericsson Lund. The inauguration of MAPCI took place on June 3. Björn Landfelt, ELLIIT-professor from EIT/LU, has been appointed acting scientific director for MAPCI.

First Steps for the NAO Halmstad Group

The NAO Halmstad Group consists of five NAO robots, one of which is at Rice University, the other visiting Halmstad University, another at Texas A&M, and two at Al-Faisal University. The group is intended as a common platform for the research teams to share and help evaluate ideas from each other. In May of this year, the group at Halmstad conducted several experiments to evaluate some new bipedal walking codes developed by Texas A&M. A video of one of the test walks is [available online](#). The group was also visited by [two very young robot enthusiasts](#), who were captivated by an earlier [appearance on TV4 Halland](#) in April.



LUCAS Day in Lund

The annual LUCAS day will be organized in Lund on October 1, 2013. The theme for this edition of the LUCAS day is “The Cloud Comes Closer – Clearing the Mist”. Cloud computing, Internet of Things – are buzzwords which we have heard for long now. Cloud computing is already practice and embryos of IoT also exist. But how do they scale, and how do they interplay? The theme of the LUCAS-dag 2013 is on how the cloud comes closer – call it mist if you like – when the flexibility and capacity offered by cloud technologies are combined with the locality of IoT technologies. The LUCAS day brings together a set of industry speakers to talk about their challenges and practices and present ongoing and future research in applied software at Lund University. For more information see http://www.lth.se/programvaruportalen/kalendarium/lucas_2013/2013-10-01-lucas-day/

Third Halmstad Summer School

Halmstad University held [the third Summer School on Software Testing](#) from June 3rd-5th. The sessions gave students an overview of the state-of-the-art in the field, including theory, industrial cases, tools and hands-on tutorials by internationally-renowned researchers. The school featured presentations by Robert Cartwright (Rice), Wen-Ling Huan and Jan Paleska (Bremen), John Hughes (QuiviQ and Chalmers), Tony Larsson (Halmstad), Rex Page (Oklahoma), Mohammad Mousavi (Halmstad), Rickard Nilsson (Lund), and Walid Taha (Halmstad). The 25 attendees came from as far afield as Denmark, the Netherlands, Germany, UK and the US, as well as from around Sweden. Material from the summer school is available online.

Research Cooperation with the Global 500 Bank UBS Initiated

IT organizations are under increasing pressure to react to external events that are difficult to foresee and predict. The goal of the research cooperation between BTH and UBS is to better understand the problem and identify solutions that IT organizations can use to prepare for change. To achieve this goal, Indira Nurdiani is studying the experiences of UBS key employees and extracts patterns and rules for achieving flexibility and for managing its trade-offs.

Cloud Control Workshop in Lund

The second cloud control workshop will be held in Lund on September 25-26, 2013. The workshop which is co-organized by the VR framework programme Cloud Control and by MAPCI includes keynotes by Guillaume Pierre, IRISA/Université de Rennes and John Wilkes, Google Inc.

Some Top Publications:

- Stability-Aware Analysis and Design of Embedded Control Systems, Authors: Amir Aminifar, Petru Eles, Zebo Peng and Anton Cervin, International Conference on Embedded Software (EMSOFT), Montreal, October 2013



- Designing Bandwidth-Efficient Stabilizing Control Servers, Authors: Amir Aminifar, Enrico Bini, Petru Eles and Zebo Peng, IEEE Real-Time Systems Symposium (RTSS), Vancouver, December 2013
- On Road Network Utility Based on Risk-Aware Link Choice, E. Fitzgerald and B. Landfeldt, IEEE Intelligent Transport Systems Conference (ITSC), The Hague, Netherlands October 2013
- Trading Accuracy and Resource Usage in Highly Dynamic Vehicular Networks, E. Fitzgerald and B. Landfeldt, IEEE Intelligent Transport Systems Conference (ITSC), The Hague, Netherlands October 2013
- H. L. Akin, N. Ito, A. Jacoff, A. Kleiner, J. Pellenz, and A. Visser. RoboCup Rescue Robot and Simulation Leagues. *AI Magazine*, vol. 34, no. 1, pp. 78-87, 2013.
- C. Dornhege and A. Kleiner. A Frontier-Void-Based Approach for Autonomous Exploration in 3D. *Advanced Robotics*, vol. 27, no. 6, pp. 459-468, Taylor and Francis, 2013.
- Q. Hamp, O. Gorgis, P. Labenda, M. Neumann, T. Predki, L. Heckes, A. Kleiner, and L. M. Reindl. Study of efficiency of USAR operations with assistive technologies. *Advanced Robotics*, vol. 27, no. 5, pp. 337-350, Taylor and Francis, 2013.
- F. Leduc-Primeau, S. Hemati, S. Mannor, and W. Gross, "Relaxed half-stochastic belief propagation," *IEEE Trans. Comm.*, vol. 61, no. 5, pp. 1648-1659, May 2013.
- A. Eghbali, H. Johansson, and T. Saramäki, "A method for the design of Farrow-structure based variable fractional-delay FIR filters," *Signal Processing*, vol. 93, no. 5, pp. 1341-1348, May 2013.
- M. Abbas, O. Gustafsson, and H. Johansson, "On the fixed-point implementation of fractional-delay filters based on the Farrow structure," *IEEE Trans. Circuits Syst. I - Regular Papers*, vol. 60, no. 4, pp. 926-937, Apr. 2013.
- G. Sarkis, S. Hemati, S. Mannor, and W. Gross, "Stochastic decoding of LDPC codes over $GF(q)$," *IEEE Trans. Comm.*, vol. 61, no. 3, pp. 939-950, March 2013.
- W. J. Xu, Y. Yajun, and H. Johansson, "Improved filter bank approach for the design of variable bandedge and fractional delay filters," accepted to *IEEE Trans. Circuits Syst. I: Regular Papers*.
- H. Johansson, "On FIR filter approximation of fractional-order differentiators and integrators," accepted to *IEEE J. Emerging Selected Topics Circuits Syst*.
- A. K. M. Pillai and H. Johansson, "Efficient signal reconstruction scheme for M-channel time-interleaved ADCs," accepted to *Analog Integrated Circuits and Signal Processing: Special Issue on NEWCAS 2012*.
- A. Ciobanu, S. Hemati, and W. Gross, "Adaptive multiset stochastic decoding of non-binary LDPC codes," accepted to *IEEE Trans. Signal Processing*.
- S. A. Aamir, P. Angelov, and J. J. Wikner, "A 1.2-V analog interface for a 300-MSps HD video digitizer in core 65-nm CMOS," accepted to *IEEE Trans. VLSI Syst*.
- Emma Söderberg, Torbjörn Ekman, Görel Hedin, Eva Magnusson. Extensible intraprocedural flow analysis at the abstract syntax tree level. *Science of Computer Programming*, vol. 78, no. 10, pp 1809–1827, Elsevier, Oct 2013.



- Emma Söderberg, Görel Hedin. Circular Higher-order Reference Attribute Grammars. 6th International Conference on Software Language Engineering, Indianapolis, Indiana, USA, Oct 2013. To appear.
- Jesper Öqvist, Görel Hedin. Extending the JastAdd Extensible Java Compiler to Java 7. 2013 International Conference on Principles and Practices of Programming on the Java platform: virtual machines, languages, and tools. Stuttgart, Germany, Sept 2013. To appear.
- D. Nace, M. Pioro, A. Tomaszewski and M. Zotkiewicz: Complexity of a classical flow restoration problem, *Networks* (2013), DOI 10.1002/net.21508.
- F. Solano and M. Pioro: WDM network re-optimization avoiding costly traffic disruptions, *Telecommunication Systems* (2013) 52:907–918, DOI 10.1007/s11235-011-9584-3.
- E. G. Larsson, F. Tufvesson, O. Edfors and T. L. Marzetta, “Massive MIMO for next generation wireless systems”, *IEEE Communications Magazine*. To appear. <http://arxiv.org/abs/1304.6690>
- Johannes Lindblom, Eletherios Karipidis, Erik G. Larsson, "Efficient Computation of Pareto Optimal Beamforming Vectors for the MISO Interference Channel with Successive Interference Cancellation", *IEEE Transactions on Signal Processing*, (Accepted), 2013.
- S. K. Mohammed and E. G. Larsson, “Constant-envelope multiuser precoding for frequency-selective massive MIMO systems,” *IEEE Wireless Communications Letters*. To appear. <http://arxiv.org/abs/1305.1525>
- H. Q. Ngo, M. Matthaiou, T. Q. Duong and E. G. Larsson, “Uplink performance analysis of multicell MU-SIMO systems with ZF receivers,” *IEEE Transactions on Vehicular Technology*. To appear.
- J. Lindblom, E. Karipidis and E. G. Larsson, “Achievable outage rate regions for the MISO interference channel,” *IEEE Wireless Communication Letters*. To appear.
- D. Persson, T. Eriksson and E. G. Larsson, “Amplifier-aware multiple-input multiple-output power allocation,” *IEEE Communication Letters*. To appear.
- Arash Vahidi and Christopher Jämthagen, “Secure RPC in embedded systems - evaluation of some GlobalPlatform implementation alternatives “, 8th Workshop on Embedded Systems Security (WESS 2013)
- Khoa Tan Nguyen, Timo Ropinski: Large-Scale Multiple Sequence Alignment Visualization through Gradient Vector Flow Analysis. *IEEE Symposium on Biological Data Visualization - 2013* (accepted).
- Shah S. M. A., Gencel C., Alvi U. And Petersen K., “Towards a Hybrid Testing Process Unifying Exploratory Testing and Scripted Testing”, *Journal of Software: Evolution and Process*, accepted for publication.
- Gencel C., Petersen K., Mughal A. A. And Iqbal M. I., “A Decision Support Framework for Metric Selection in Goal-Based Measurement Programs: GQM-DSFMS”, *Journal of Systems and Software*, accepted for publication.
- Mäntylä M., Khomh F., Adams B., Engström E. and Petersen K., “On Rapid Releases and Software Testing”, *Proceedings of the 29th IEEE International Conference on Software Maintenance (ICSM 2013)*, Eindhoven, Netherlands, 2013.
- Bjarnason, E., P. Runeson, M. Borg, M. Unterkalmsteiner, E. Engström, B. Regnell, G. Sabaliauskaite, A. Loconsole, T. Gorschek, and R. Feldt (2013). Challenges and Practices in



Aligning Requirements and Verification & Validation: An Industrial Multi-Unit Case Study. Empirical Software Engineering, <http://dx.doi.org/10.1007/s10664-013-9263-y>

- Hassan, A. E., A. Hindle, P. Runeson, M. Shepperd, P. Devanbu, and S. Kim (2013). Roundtable: What's Next in Software Analytics. IEEE Software 30(4), 53–56 <http://dx.doi.org/10.1109/MS.2013.85>
- Runeson, P., A. Stefik, and A. Andrews (2013). Variation Factors in the Design and Analysis of Replicated Controlled Experiments – Three (Dis)similar Studies on Inspections versus Unit Testing. Empirical Software Engineering, <http://dx.doi.org/10.1007/s10664-013-9262-z>
- B. Regnell and K. Kuchcinski. A Scala embedded dsl for combinatorial optimization in software requirements engineering. In COSpeL: The first Workshop on Domain Specific Languages in Combinatorial Optimization, Uppsala, Sweden, 2013
- Michael Felsberg's group at LiU/ISY has released a new data set for vehicle related research in computer vision, see <http://www.cvl.isy.liu.se/research/datasets/amuse>
- Vasileios Zografos, Liam Ellis, Rudolf Mester Discriminative Subspace Clustering. CVPR 2013
- Martina Maggio, Enrico Bini, Georgios Chasparis, Karl-Erik Årzén: "A Game-Theoretic Resource Manager for RT Applications". In 25th Euromicro Conference on Real-Time Systems, ECRTS13, Paris, France, July 2013.
- Georgios Chasparis, Martina Maggio, Karl-Erik Årzén, Enrico Bini: "Distributed Management of CPU Resources for Time-Sensitive Applications". In 2013 American Control Conference, Washington, DC, June 2013.
- Martina Maggio, Henry Hoffmann, Marco Domenico Santambrogio, Anant Agarwal, Alberto Leva: "Power Optimization in Embedded Systems via Feedback Control of Resource Allocation". IEEE Transactions on Control Systems Technology, 21:1, pp. 239–246, 2013.

Keynotes and Invited Talks:

- [Walid Taha](#) gave the invited talk at the Fifth International Workshop on Equation-based Object Oriented Languages ([EOOLT 2013](#)) in Nottingham, UK, in April. The talk described the motivation and progress towards computing enclosures for hybrid systems.
- Mohammad Mousavi gave an invited talk at the 25th anniversary meeting on Compositionality and Concurrency ([WS25CCC](#)), which was held at Königswinter in Germany, from August 6th-9th. In his talk, Mohammad presented an overview of his past research on model-based testing and outlined the direction of his ongoing research in this area.
- Mohammad Mousavi gave an invited talk on model-based testing at the joint session of the IFIP WG 1.8 Workshop on Future Trends in Concurrency ([TRENDS 2013](#)) and Momentum Gathering ([MEALS](#)) on August 31st. These were both organized as satellite events of CONCUR 2013 in Buenos Aires, Argentina.
- Anders Heyden, LU/MIG, gave the invited presentation "Robot Vision: Hand-Eye Calibration, Map-Making and Navigation" at the Scandinavian Conference on Image Analysis (SCIA 2013)
- Claes Wohlin, BTH, gave a keynote at the 8th International Conference on Software Technologies in Reykjavik, Iceland in July 2013.

Awards and Appointments:

- The inaugural IEEE International Conference on Cyber-Physical Systems, Networks and Applications ([CPSNA'13](#)) was held in Taipei, Taiwan, from Aug 19th - 20th. The [Best Paper](#)



[Award](#) went to “[Enclosing the Behavior of a Hybrid System up to and Beyond a Zeno Point](#)” by [Michal Konecny](#) (Aston University), [Walid Taha](#) (Halmstad University), [Jan Duracz](#) (Halmstad University), [Adam Duracz](#) (Halmstad University), and [Aaron Ames](#) (Texas A&M). This paper shows how enclosures (safe upper and lower bounds) on functions can be used to provide an elegant, executable semantics for computing the behavior of hybrid systems, including some that exhibit Zeno phenomena. The semantics has been implemented and is freely available online as part of the [Acumen](#) modeling tool. Currently, this new semantics is only supported for a subset of the language that has a direct correspondence to hybrid automata.

- Dr. Mario Garrido, Jens Ogniewski, and Dr. Ingemar Ragnemalm (LiU/ISY) received the best paper award at IADIS Computer Graphics, Visualization, Computer Vision and Image Processing in Prague, July 2013 for their paper (co-authored with former LiU MSc Sreehari Ambulari and Dr. Gabriel Caffarena, Universidad Politécnica de Madrid): "New radix-2 and radix-2² constant geometry fast Fourier transform algorithms for GPUs".
- Yuan Li, EIT/LU, has been granted an Ericsson Research Foundation grant supporting his travel to the INOC conference in Tenerife, Spain, May 2103.
- Timo Ropinski (LiU) has been appointed chairman of SIGRAD, the national Swedish organization for computer graphics and interactive techniques. The goal of the organization is to bring together researchers from these fields, and to enable cooperation between different universities, as well universities and industry.
- Claes Wohlin, BTH, has been appointed guest professor at Shandong University at Weihai in China from July 1, 2013 to June 30, 2016.
- The paper “Octree Light Propagation Volumes” by John David Olovsson and Michael Doggett, LiU/IDA, received the best student paper award at SIGRAD 13, June 13-14 2013, Norrköping, Sweden

Some new dissertations:

- TVK Chaitanya at LiU/ISY/communication systems defends his Ph.D. thesis "*HARQ Systems: Resource Allocation, Feedback Error Protection, and Bits-to-Symbol Mappings*" on Sept. 27
- A. Pitarokoilis at LiU/ISY/communication systems defends his licentiate thesis "*On the performance of Massive MIMO systems with single carrier transmission and phase noise*" on Oct. 11
- Alma Orucevic-Alagic, LU/CS, defended her Lic thesis, Advancing Software Development Efficiency in an Open Source Software Context, May 24 2013. The thesis has got considerable press cover, with a full page in Computer Sweden <http://computersweden.idg.se/2.2683/1.518715/oppen-kallkod-ar-hart-hallen?mv=pass> Alma also participated in a Science Slam in Malmö. The event is recorded at Bambuser. <http://fb.me/1UuKVelsu>
- Annette Böhm, "Delay-Sensitive Wireless Communication for Cooperative Driving Applications," Halmstad University, PhD Dissertation, June 7, 2013. Link to thesis: <https://halmstaduniversity.box.com/ab-thesis>



Program chairs and Editorships:

ELLIIT researchers have been or will be program chairs at the following international conferences:

- Alexander Kleiner, LiU, is serving as General Chair of the IEEE International Symposium on Safety, Security, and Rescue Robotics (SSRR-2013). The conference together with the Rescue Camp (Summer School) will take place at Linköping University 21-26 October (<http://www.ssrr-conference.org/2013/>). More than 100 researchers from Asia, US, and Europe are expected.
- Prof. Håkan Johansson (LiU/ISY) has become area editor of the journal Digital Signal Processing.
- Dr. Amir Eghbali (LiU/ISY) has become associate editor of the journal Digital Signal Processing.
- LU, LiU and Uppsala University together organize the 22nd International Conference on Pattern Recognition (ICPR 2014) 24-28 August 2014, Stockholm <http://www.icpr2014.org> Several ELLIIT are involved including Anders Heyden (General Chair) and Michael Felsberg (Publication Chair)
- The 2013 edition of the Workshop on Wireless Vehicular Communications will be in Halmstad on November 20. This year, the invited speaker will be Falko Dressler, University of Innsbruck, Austria. Like previous years, there will also be presentations given by researchers from Lund, Chalmers and Halmstad University.

Personalförändringar

Martina Maggio new junior ELLIIT researcher at LU/Control

Martina Maggio originally from Politecnico di Milano received the first LU junior female ELLIIT researcher position. The position starts 2014 and the ELLIIT funding is provided for two years. Her research is focused on feedback scheduling with applications in embedded systems, general computing systems, and cloud computing infrastructure.

Emma Söderberg to Google

Emma Söderberg, currently postdoc at LU/CS, will join Google, Mountain View, starting in November 2013.

Johan Åkesson to Modelon

Johan Åkesson has been working part time at LU/Control and part time at Modelon, and joins Modelon full time starting August 2013.

Eleftherios Karipidis to Ericsson

Dr. Eleftherios Karipidis, formerly with LiU/ISY/communication systems, has joined Ericsson Research in Stockholm.

Annette Böhm to Univ of Waterloo

Annette Böhm, HH, is now with the University of Waterloo, Ontario, Canada, doing a postdoc in the group of Prof. Xuemin (Sherman) Shen.

Forskningsfinansiering

- Dr. Oscar Gustafsson (LiU/ISY) accepted a short term 25 kEuro offer from European Space Agency on "Optimised DSP Building Blocks for On Board Processing".
- FP7-MAMMOET (partners: IMEC, KU Leuven, Ericsson, Infineon, LU, LiU, and TEC) received 15.0/15.0 in the EC evaluation and will start in 2014 subject to successful final negotiations. Points of contact at LU: O. Edfors and V. Öwall. At LiU: E.G. Larsson. The project will develop new transmission techniques for massive MIMO.
- Michael Felsberg's group at LiU/ISY has just held the kick-off meeting for iQmatic, a collaboration project involving among others Scania on autonomous vehicles