



ELLIIT Nyhetsblad 11 – Juni 2015

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

Nyheter

ELLIIT Evaluation

ELLIIT was evaluated during Fall 2014 and in the beginning of May 2015 the recommendation letter from the funding agencies responsible for the strategic research areas was available. The grades for ELLIIT were quite good:

Performance: Good

Strategy: Excellent/good

Added value: Excellent

and the short statement was also good:

[ELLIIT] is an SRA spanning the research fields of communications, networks, control, electronics, embedded systems, software, autonomous systems, and complex systems and reaches the highest international quality for research in control theory. It has four participating higher education institutions – LiU (as host), Lund University (LU), Blekinge Institute of Technology (BTH) and Halmstad University (HH) – and has strong links to industry including an industrial board with representatives from Ericsson, ABB, Scania, Sectra, Schneider, Axis and SAAB. This board, along with the SRA's International Scientific Advisory Board, has provided valuable guidance on which research programmes to support and which to abandon. SRA funding has been used primarily to recruit high-quality researchers. Through the SRA funding [ELLIIT] has significantly strengthened cooperation between its participants; it has attracted >76 MSEK in new grants; filed several patents: and had a significant impact on education at all levels.

This will most likely mean that ELLIIT will continue at its current level also during coming years. This is, however, not decided until end of September when the government bill on research is available. For more information about the evaluation, see

<https://publikationer.vr.se/produkt/evaluation-of-the-strategic-research-area-initiative-2010-2014/>

and

<http://www.vr.se/download/18.5f3cd6ec14d0737bc694553b/1430376205962/Myndigheternas+rekommendationer150429.pdf>

ELLIIT Workshop

The annual ELLIIT workshop will this year be held at Halmstad University with Mohammad Reza Mousavi as the chair. The dates will be October 1-2 2015 and the keynote speakers are Holger Hermanns (Saarland University, Germany) and Wayne Luk (Imperial College, UK).

Wallenberg Autonomous Systems Program (WASP)

28 May the Knut and Alice Wallenberg Foundation (KAW) decided to finance Swedish research on autonomous systems and software engineering with 1.3 Billion Swedish kronor over the period 2015-2025. To this should be added university co-financing and industrial co-financing of together 500 MSEK, i.e., a total budget of 1.8 Billion SEK. The majority of the money will go to Linköping University, Lund University, Chalmers, and KTH. A smaller part will go to Umeå University. Several of the ELLIIT researchers at Lund and Linköping have been involved in the proposal writing, including Patrick Doherty, Fredrik Gustafsson, Anders Ynnerman, Lars Nielsen, Karl-Erik Årzén, Anders Rantzer, Fredrik Tufvesson, and Görel Hedin. Lars Nielsen from Linköping University will be program director and Mille Millnert, also from Linköping University, will be chairman of the board. For more information about WASP, please go to

<https://www.wallenberg.com/kaw/18-miljarder-kronor-till-forskning-om-autonoma-system-och-mjukvaruutveckling>

MAPCI hosting new positioning lab.

The new Lund Positioning Lab will aggregate research in Lund University around positioning technology. Regional industry will also be provided modern facilities for experiments and give opportunities to build valuable academic contacts. Key persons and early actors in this environment are Björn Landfeldt (MAPCI), Kalle Åström (Mathematics), Fredrik Tufvesson (EIT), and Bo Bernhardsson (Automatic Control).

5G for Sweden

Ericsson announced that they will initiate research into 5G for Sweden during an event at the Mobile World Congress 2015 in Barcelona, Spain. Sara Mazur, Head of Ericsson Research, said in a press statement: "By bringing strong industries and leading universities and research institutions together, we will gain valuable insights and innovations that will enable industries to become digital, using 5G as an enabler." Among the industry partners are Swedish companies Scania and Volvo Construction Equipment. The academic and research partners are Sweden's Royal Institute of Technology, Chalmers University of Technology, Linköping University, Lund University and Swedish ICT - Part of RISE (Research Institutes of Sweden).



Some Publications:

- Amir Aminifar, Petru Eles, Zebo Peng: Jfair: a scheduling algorithm to stabilize control applications, 21st IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS), Received the best student paper award.
- Amir Aminifar, Enrico Bini, Petru Eles, Zebo Peng: Analysis and Design of Real-Time Servers for Control Applications, IEEE Transactions on Computers, 2015
- A. Rantzer, Scalable Control of Positive Systems, European Journal of control, <http://dx.doi.org/10.1016/j.ejcon.2015.04.004>, Published online 7 May 2015.
- V. Savic, H. Wymeersch and E. G. Larsson, "Target tracking in confined environments with uncertain sensor positions," IEEE Transactions on Vehicular Technology. To appear.
- E. Björnson, M. Matthaiou, A. Pitarokoilis, and E. G. Larsson, "Distributed massive MIMO in cellular networks: Impact of imperfect hardware & number of oscillators," in Proc. of European Signal Processing Conference (EUSIPCO), Aug. 2015. To appear.
- H. Q. Ngo, A. Ashikhmin, H. Yang, E. G. Larsson and T. L. Marzetta, "Cell-free massive MIMO: Uniformly great service for everyone," in Proc. of IEEE Signal Processing Advances in Wireless Communications (SPAWC), June 2015. To appear.
- S. Kashyap, E. Bjoörnson and E. G. Larsson, "On the feasibility of wireless energy transfer using massive antenna arrays in Rician channels," in Proc. of IEEE Signal Processing Advances in Wireless Communications (SPAWC), June 2015.
- E. G. Larsson, "Joint beamforming and broadcasting in massive MIMO," in Proc. of IEEE Signal Processing Advances in Wireless Communications (SPAWC), June 2015.
- C. Molén and E. G. Larsson, "Multiuser MIMO precoding with per-antenna continuous-time constant-envelope constraints," in Proc. of IEEE Signal Processing Advances in Wireless Communications (SPAWC), June 2015.
- A. Pitarokoilis, E. Björnson and E. G. Larsson, "Optimal detection in training assisted SIMO systems with phase noise impairments," in Proc. of IEEE International Conference on Communications (ICC), June 2015.
- X.Jiang, M.Cirkić, F.Kaltenberger, E.G.Larsson, L.Deneire and R.Knopp, "MIMO-TDD reciprocity under hardware imbalances: Experimental results," in Proc. of IEEE International Conference on Communications (ICC), June 2015.
- H. V. Cheng, D. Persson, E. Bjoörnson and E. G. Larsson, "Massive MIMO at night: on the operation of massive MIMO in low traffic scenarios," in Proc. of IEEE International Conference on Communications (ICC), June 2015.
- S. Kashyap, E. Björnson and E. G. Larsson, "Can wireless power transfer benefit from large transmitter arrays?" in Proc. of IEEE Wireless Power Transfer Conference (WPTC), May 2015.
- H. Q. Ngo and E. G. Larsson, "Blind estimation of effective downlink channel gains in massive MIMO," in Proc. of IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), April 2015.



- E. Axell, E. G. Larsson and D. Persson, "GNSS spoofing detection using multiple mobile COTS receivers," in Proc. of IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), April 2015.
- Y. Wang, H. Johansson, H. Xu, and Z. Sun, "Joint blind calibration for mixed mismatches in two-channel time-interleaved ADCs," IEEE Trans. Circuits Syst. I - Regular Papers, to appear.
- H. Johansson and F. Harris, "Polyphase decomposition of digital fractional-delay filters," IEEE Signal Processing Lett., vol. 22, no 8, pp. 1021–1025, Aug. 2015.
- Y. Wang, H. Xu, H. Johansson, Z. Sun, and J. J. Wikner, "Digital estimation and compensation method for nonlinearity mismatches in time-interleaved analog-to-digital converters", Digital Signal Processing (Elsevier), vol. 51, pp. 130–141, June 2015.
- H. Johansson and H. Göckler, "Two-stage based polyphase structures for arbitrary-integer sampling rate conversion," IEEE Trans. Circuits Syst. II - Express Briefs, vol. 62, no. 5, pp. 486–490, May 2015.
- A. K. M. Pillai and H. Johansson, "Prefilter-based reconfigurable reconstructor for time-interleaved ADCs with missing samples," IEEE Trans. Circuits Syst. II - Express Briefs, vol. 62, no. 4, pp. 392–396, Apr. 2015.
- A. Eghbali and H. Johansson, "Design of modulated filter banks and transmultiplexers with unified initial solutions and very few unknown parameters," IEEE Trans. Circuits Syst. II - Express Briefs, vol. 62, no. 4, pp. 397–401, Apr. 2015.
- Y. Wang, H. Johansson, and H. Xu, "Adaptive background estimation for static nonlinearity mismatches in two-channel TIADCs," IEEE Trans. Circuits Syst. II - Express Briefs, vol. 62, no. 3, pp. 226–230, Mar. 2015.
- H. Johansson and O. Gustafsson, "Filter-bank based all-digital channelizers and aggregators for multi-standard video distribution," in Proc. IEEE Int. Conf. Digital Signal Processing, Singapore, July 21–24, 2015.
- H. Johansson and O. Gustafsson, "On frequency-domain implementation of digital FIR filters," in Proc. IEEE Int. Conf. Digital Signal Processing, Singapore, July 21–24, 2015.
- O. Gustafsson and H. Johansson, "Decimation filters for high-speed delta-sigma modulators with passband constraints: General versus CIC-based FIR filters," in Proc. IEEE Int. Symp. Circuits Syst., Lisbon, Portugal, May 24–27, 2015.
- Bjarnason, E., K. Smolander, E. Engström, and P. Runeson (2015). A Theory of Distances in Software Development. Information and Software Technology doi:10.1016/j.infsof.2015.05.004. (Nydanande teori-arbete inom software engineering)
- Engström, E.; Petersen, K., "Mapping software testing practice with software testing research — SERP-test taxonomy," Software Testing, Verification and Validation Workshops (ICSTW), 2015 IEEE Eighth International Conference on , vol., no., pp.1,4, 13-17 April 2015 doi: 10.1109/ICSTW.2015.710747 (Taxonomi för att koppla akademisk forskning till industriell praxis - ett direkt resultat från ELLIIT-projektet mellan LTH och BTH)



- Elizabeth Bjarnason, Michael Unterkalmsteiner, Emelie Engström, Markus Borg, An Industrial Case Study on Test Cases as Requirements, Proceedings of Agile Processes in Software Engineering and Extreme Programming (XP), Helsinki, Finland, 2015-05-25/2015-05-29 (Industriell fallstudie för att förbättra och effektivisera kopplingen mellan krav och test)
- D. Smite, F. Calefato and C. Wohlin, "Cost Savings in Global Software Engineering - Where's the Evidence", IEEE Software, Vol. 32, No. 4, pp. 26-32, 2015.
- B. Ulziit, Z.A. Warraich, C. Gencel C., K. Petersen, "A Conceptual Framework of Challenges and Solutions for Global Software Maintenance", Software: Process and Evolution, accepted for publication.
- K. Petersen, S. Vakkalanka, L. Kuzniarz, "Guidelines for Conducting Systematic Mapping Studies in Software Engineering: An Update", Information and Software Technology, accepted for publication.
- J. Börstler, M.E. Caspersen, M. Nordström, "Beauty and the Beast: on the readability of object-oriented example programs", Software Quality Journal, accepted for publication.
- L. Minku, F. Sarro, E. Mendes, "How to Make Best Use of Cross-Company Data for Web Effort Estimation?", Proceedings of the 9th ACM/IEEE International Symposium on Empirical Software Engineering and Measurement, 2015.
- K. Petersen, E. Engström, "Mapping software testing practice with software testing research", Proceedings of Testing: Academic & Industrial Conference - Practice and Research Techniques, 2015.
- K. Petersen, Nauman bin Ali, "Operationalizing the requirements selection process with study selection procedures from systematic literature reviews", Proceedings of the 6th International Workshop on Requirements Prioritization and Communication, 2015.
- A.N. Ghazi, K. Petersen, J. Börstler, "Heterogeneous Systems Testing Techniques: An Exploratory Survey", Proceedings of Software Quality. Software and Systems Quality in Distributed and Mobile Environments, Springer 2015.
- M. Usman, E. Mendes, J. Börstler, "Effort estimation in agile software development: a survey on the state of the practice", Proceedings of the 19th International Conference on Evaluation and Assessment in Software Engineering, 2015.
- Georgios C. Chasparis, Martina Maggio, Enrico Bini, Karl-Erik Årzén, "Design and Implementation of Distributed Resource Management for Time Sensitive Applications", Automatica (Accepted for publication)
- Alessandro Vittorio Papadopoulos, Martina Maggio, Federico Terraneo, Alberto Leva, "A Dynamic Modelling Framework for Control-based Computing System Design", Mathematical and Computer Modelling of Dynamical Systems, 21:3, pp. 251–271, 2015.
- Alessandro Vittorio Papadopoulos, Martina Maggio, Alberto Leva, Enrico Bini, "Hard real-time guarantees in feedback-based resource reservations", Real-Time Systems, 2015.



Keynotes and Invited Talks:

- Mohammad Mousavi (HH) will give an invited talk at the 26th Conference on Concurrency Theory (CONCUR 2015) in Madrid, Spain. Mohammad Mousavi will also give a keynote speech at the 21st Dutch Testing Day in Eindhoven, The Netherlands.
- Anders Rantzer (LiU/AC) will give a plenary Lecture at the European Control Conference 2015, Linz , Austria, July 2015.
- Emil Björnson & Erik Larsson, Fredrik Tufvesson & André Bourdoux (imec) gave two tutorials on Massive MIMO for 5G on IEEE International Conference in Communication in London in June. First Emil and Erik lectured about the theory behind massive MIMO and recent results in the area and then Fredrik and André followed up with a lecture about practical aspects and implementation issues. These tutorials were a result of joint efforts in the EU FP7 project MAMMOET.
- Emilia Mendes (BTH) will give a keynote at the 14th Brazilian Symposium on Software Quality. Emilia Mendes will also give a keynote at the 9th International Conference on Software, Knowledge, Information Management and Applications.

Awards and Appointments:

- Dr. Hien Ngo, Prof. Erik G. Larsson and Dr. Thomas Marzetta won the 2015 Stephen O. Rice Prize Paper Award in the Field of Communications Systems for their paper "Energy and Spectral Efficiency of Very Large Multiuser MIMO Systems", IEEE Transactions on Communications, 2013. The authors also received the IEEE Sweden VT-COM-IT Best Journal Paper Award for the same paper.
- Dr. Thomas Marzetta, scientific advisor in ELLIIT, from Bell Labs received an honorary doctorate from LiU in May 2015.
- Liesbet Van der Perre from IMEC, also scientific advisor in ELLIIT, became honorary doctor at Lund University for her long term contributions to the research and research centers at Lund University.
- OpenCV State of the Art Vision Challenge, Winners Category Tracking: Martin Danelljan, Gustav Häger, Fahad Shahbaz Khan, Michael Felsberg, from LiU (Discriminative Scale Space Tracker) (<http://code.opencv.org/projects/opencv/wiki/VisionChallenge>)
- The paper "Optimal Design of Energy-Efficient HetNets: Joint Precoding and Load Balancing" by J Li, Emil Björnson, Tommy Svensson, Thomas Eriksson and Mérouane Debbah received the best paper award of the Signal Processing for Communications symposium at ICC 2015, London, UK.
- Professor Per Runeson (LU/CS) valdes till styrelseledamot (vice ordförande) i Swedsoft som är en ideell förening öppen för industri, akademi och offentlig sektor med verksamhet i Sverige och intresse för utveckling och användning av mjukvara. Swedsoft vill göra Sverige till ett innovationscenter för mjukvaruintensiva system och genom det bidra till att stärka välfärd, industriell konkurrenskraft och Sveriges akademiska status i världen.
<http://swedsoft.se>



- Samuel Fricker (BTH) received the best paper award at the IEEE HealthCom Conference 2014.
- Ahmad Nauman Ghazi, Kai Petersen, and Jürgen Börstler (BTH) received the best paper award at SWQD 2015, Software Quality Days, the 7th International Conference.
- Andreas Stolt, Dept of Automatic Control, Lund, who has been working with lead-through functionality for the new two-armed robot Yumi from ABB, was nominated for Best Conference Paper Award, Best Student Conference Paper Award and Best Automation Paper Award with the paper "*Detection of Contact Force Transients in Robotic Assembly*" by A. Stolt, M. Linderoth, A. Robertsson, and R Johansson at ICRA'15 in Seattle, May 2015.

Program chairs and Editorships:

- Mohammad Mousavi (HH) and Christian Berger (Chalmers) are organizing the 5th Workshop on Design, Modeling and Evaluation of Cyber Physical Systems (CyPhy'15), in Amsterdam, The Netherlands.
- Veronica Gaspes, Mohammad Mousavi, and Walid Taha (HH) are organizing the 5th Halmstad Summer School on Testing in Halmstad, Sweden.
- Mohammad Mousavi (HH) and Ilaria Castellani (INRIA, Sophia Antipolis Méditerranée) are organizing the 4th IFIP WG 1.8 Workshop on Trends in Concurrency Theory in Madrid, Spain.
- Michael Felsberg (LiU) is Track Chair (Image, Speech, Signal and Video Processing) for the 23rd International Conference on Pattern Recognition 2016. Michael Felsberg is also Co-Chair for the Workshop "Visual Object Tracking Challenge" at the International Conference on Computer Vision 2015
- Samuel Fricker (BTH) is Program Co-Chair of RefsQ 2015, the 21st International Conference on Requirements Engineering: Foundation for Software Quality.
- Kai Petersen (BTH) will be Program Co-Chair of the Joint Conference of the 27th International Workshop on Software Measurement and the 8th International Conference on Software Process and Product Measurement, 2017.

Dissertations:

- PhD dissertation from LiU: Freddie Åström, Variational Tensor-Based Models for Image Diffusion in Non-Linear Domains.
- S. Khoshfetrat Pakazad: Divide and Conquer: Distributed Optimization and Robustness Analysis, Linköping Studies in Science and Technology, Dissertations. No 1676, Linköping, 2015.
- Yuan Li: "Mathematical Models and Algorithms for Wireless Network Design and Optimization", Doctoral Dissertation, Department of Electrical and Information Technology, Lund University. Supervisor: prof. Michal Pioro
- Christin Lindholm, Software Risk Management in the Safety-Critical Medical Device Domain – Involving a User Perspective, <http://lup.lub.lu.se/record/5041791> (LU/CS)
- Markus Borg, From Bugs to Decision Support – Leveraging Historical Issue Reports in Software Evolution, <http://lup.lub.lu.se/record/5268091> (LU/CS)



- Nauman bin Ali (TeknDr, programvaruteknik at BTH): Operationalization of Lean Thinking through Value Stream Mapping with Simulation and FLOW. Opponent: Prof. Letizia Jaccheri, Norwegian University of Science and Technology, Norge.
- Indira Nurdiani (TeknLic, programvaruteknik at BTH): Understanding Flexibility of a Software Organization. Reviewer: Dr. Gil Regev, École Polytechnique Fédérale de Lausanne.
- Jerker Nordh, (LU/AC), Bayesian Inference for Nonlinear Dynamical Systems — Applications and Software Implementation

Personalförändringar

- New postdoc at LiU/ISY/Communication systems: Dr. Julia Vinogradova. Telecom ParisTech graduate, expert on random matrix theory with applications
- New doctoral student at LiU/ISY/Communication systems: Trinh van Chien, working with Dr. Emil Björnson as advisor.
- New doctoral student at LiU/ISY/Communication systems: Daniel Verenzuela, working with Dr. Emil Björnson as advisor.
- Samuel Fricker (BTH) har tackat ja till en professur vid University of Applied Sciences and Arts Northwestern Switzerland. Han kommer att lämna ELLIIT fr.o.m. augusti.

Forskningsfinansiering

- [Emil Björnson](#) (LiU/ISY) and Pontus Giselsson (LU/AC) both won the 2015 Ingvar Carlsson Award from the Swedish Foundation for Strategic Research (SSF). [Read more at SSF](#).
- Markus Törmänen fick tillsammans med forskare på Ericsson AB ett projekt beviljat inom det Vinnovastödda programmet smartare elektroniksystem: Sändarlösning för 5G Massive MIMO system. Projektet avser att ta fram nya arkitekturer för radiolösningar för sändare i kommande generations 5G Massive MIMO system. Projektkostnad 6 142 kSEK, beviljat bidrag 3 020 kSEK. Deltagare: Lunds universitet, Ericsson AB
- Phase 3 (Oct. 1, 2015 - Sept. 30, 2018) of the **EASE** (Embedded Applications in Software Engineering) industrial excellence center has been approved for funding by Vinnova. Partners in the project are Lund University, Blekinge Institute of Technology, Sony, Axis and SoftHouse. The yearly budget is 10.5 MSEK.