



## ELLIIT Nyhetsblad 6 – November 2013

Redaktör: Karl-Erik Årzén

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

#### **FP7 MESH-WISE Project Launched**

MESH-WISE, a four-year (2013-2017) and 1.7m€ FP7 Marie Curie project had its kick-off meeting just before summer 2013. The MESH-WISE project mobilizes a joint academic-industry task force on two complementary themes. First is the development of novel mechanisms for deployment and resource allocation of self-organizing mesh networks. The second theme comprises the investigation of multipurpose and heterogeneous mesh networking and its emerging applications such as traffic offloading, emergency deployment and provisioning, and sensor integration.

The consortium is composed by five partners: LiU/ITN/Mobile Telecommunications, LU/EIT/Networking, FORTH, and two industrial partners Forthnet and MobiMESH. LiU/ITN is the project coordinator.

#### **New Scania representative in ELLIIT industrial advisor board**

Gunnar Tornmalm replaces Tony Sandberg as Scania's representative in ELLIIT's industrial advisory board. Gunnar is Head of Predevelopment, Systems Development, Scania CV AB. The reason for the change is that Tony Sandberg has moved to a new position within Scania.

#### **Episode Hjärnkontoret Program in Swedish National Television**

Students and researchers from Halmstad University helped produce an episode of a children's program for the Swedish National Television. An [online version](#) of the episode.

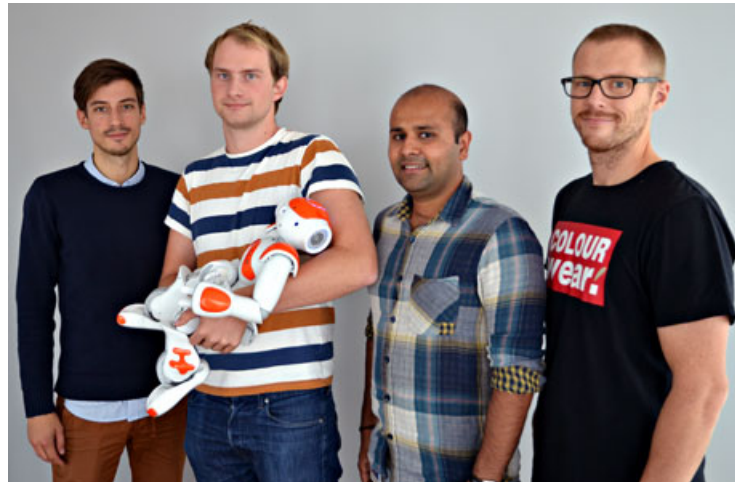


Photo from HH article about episode. Picture: Emiie Andersson.

## Interview with Patrick Doherty

An interview with Patrick Doherty (LiU/IDA) was published in KI, the German journal of Artificial Intelligence. <http://www.control.lth.se/media/ELLIIT/doherty.pdf>

## New Acumen release

A new version of the Acumen hybrid systems modeling and simulation environment has been released. Improvements in this version include better error reporting, extensions to the enclosure semantics, a new reference manual, memory utilization improvements and various user interface enhancements. The new version is available for download at <http://acumen-language.org>.

## NSF CPS PI meeting 2013

Walid Taha (HH) participated at the NSF CPS PI meeting in DC last October 16-18. Taha presented the PI poster and offered a demo of Acumen. The meeting included several keynote talks include one by Lund's own Karl Åström as well as well as honoring Dr. Helen Gill from her service at the US National Science Foundation. Gill, who coined the term CPS, had a visionary role in developing the area and drawing attention to it at both the national and international levels.

## CyPhy to be held with CPSWeek

The fourth International Workshop on Design, Modeling and Evaluation of Cyber Physical Systems (CyPhy'14) co-organized by Walid Taha (HH) will take place in collocation with CPSWeek'14 in Berlin, Germany, on April 14th, 2014. To receive announcements about the workshop you may sign up for the mailing list at [cyphy.org](http://cyphy.org).



## **Fifth Halmstad Summer School on Testing**

The fifth Halmstad Summer School on Testing is to be organized from June 9 to June 13 2014. The school is aimed at students, practitioners, and researchers interested in building high-quality software. The list of invited speakers for this year will be announced in the coming month. For more information, please contact Mohammad Mousavi at Halmstad University.

## **Workshop on Wireless Vehicular Communications in Halmstad**

The fourth Workshop on Wireless Vehicular Communications at Halmstad University, was held on November 20, 2013. The workshop featured the invited speaker Falko Dressler from University of Innsbruck, Austria, funded by the IEEE VTS as well as presentations by senior researchers from Lund, Halmstad, Vienna and Chalmers University. Please see [www.hh.se/wwvc2013](http://www.hh.se/wwvc2013) for more info.

## **New results on stability analysis of large interconnected uncertain systems**

Sina Khoshfetrat Pakazad and other researchers in the ELLIIT project 6.4 "Large-scale Optimization for Systems Analysis" consider robust stability analysis of large interconnected uncertain systems. In such systems, the interconnection among the subsystems are commonly sparse, i.e., each subsystem is only connected to only a few other subsystems.

Through structure (sparsity) exploitation they have achieved

- up to 90 times speed up (within the considered examples) w.r.t. existing methods for centralized analysis such systems.
- the ability to analyze much larger interconnected systems (scalable).

Sparsity also allows them to decompose the analysis problem into several simpler problems that enables them to

- utilize distributed optimization to solve the analysis problem

Solving the analysis problem requires solving convex feasibility problems. To this end they have developed new distributed algorithms for solving feasibility problems that

- have superior convergence properties and
- allow detection of feasibility and infeasibility in a distributed way.

## **Some Publications:**

- L. Lei, K. C. Ho, S. Sun, and D. Yuan. A unified graph labeling algorithm for consecutive-block channel allocation in SC-FDMA. IEEE Transactions on Wireless Communications. To appear.
- David Broman, Christopher Brooks, Lev Greenberg, Edward A. Lee, Michael Masin, Stavros Tripakis, and Michael Wetter. Determinate Composition of FMUs for Co-Simulation. In



Proceedings of the International Conference on Embedded Software (EMSOFT 2013), Montreal, Canada, 2013.

- Maria Vasilevskaya, David Broman, and Kristian Sandahl. An Assessment Model for Large Project Courses. To appear in the Proceedings of The 45th ACM Technical Symposium on Computer Science Education (SIGCSE 2014), Atlanta, Florida, USA, 2014.
- V. Angelakis, A. Ephremides, Q. He, and D. Yuan. Minimum-time link scheduling for emptying wireless systems: solution characterization and algorithmic framework. IEEE Transactions on Information Theory. To appear.
- Hien Quoc Ngo, Erik G. Larsson, "Large-Scale Multipair Two-Way Relay Networks with Distributed AF Beamforming", IEEE Communications Letters, (Accepted), 2013.  
<http://liu.diva-portal.org/smash/get/diva2:652204/FULLTEXT01.pdf>

*The paper demonstrates how some concepts from massive MIMO can be successfully applied to relaying in large networks. Specifically we consider a multipair two-way relay network where multiple communication pairs simultaneously exchange information with the help of multiple relay nodes. All nodes are equipped with a single antenna and channel state information is available at the relay nodes. Each relay uses very simple signal processing in a distributed manner, called distributed amplify-and-forward (AF) relaying. A closed-form expression for the achievable rate is derived. We show that the distributed AF scheme outperforms conventional orthogonal relaying.*

- Vladimir Savic, Henk Wymeersch, Santiago Zazo, "Belief consensus algorithms for fast distributed target tracking in wireless sensor networks", Signal Processing, 95: 149-160, 2014.

*In distributed target tracking for wireless sensor networks, agreement on the target state can be achieved by the construction and maintenance of a communication path, in order to exchange information regarding local likelihood functions. Such an approach lacks robustness to failures and is not easily applicable to ad-hoc networks. To address this, several methods have been proposed that allow agreement on the global likelihood through fully distributed belief consensus (BC) algorithms, operating on local likelihoods in distributed particle filtering (DPF). However, a unified comparison of the convergence speed and communication cost has not been performed. In this paper, we provide such a comparison and propose a novel BC algorithm based on belief propagation (BP). According to our study, DPF based on metropolis belief consensus (MBC) is the fastest in loopy graphs, while DPF based on BP consensus is the fastest in tree graphs. Moreover, we found that BC-based DPF methods have lower communication overhead than data flooding when the network is sufficiently sparse.*

- Vangelis Angelakis (LiU/ITN) co-authored the invited paper: "Cognitive Radio Inspired M2M Communications" presented at the IEEE Global Wireless Summit 2013.



- R. R. Murphy and A. Kleiner. A Community-Driven Roadmap for the Adoption of Safety Security and Rescue Robots. In .Proc. of the IEEE Int. Workshop on Safety, Security & Rescue Robotics (SSRR). Linköping, Sweden, 2013.
- C. Dornhege, A. Kleiner, and A. Kolling. Coverage Search in 3D. In .Proc. of the IEEE Int. Workshop on Safety, Security & Rescue Robotics (SSRR). Linköping, Sweden, 2013.
- Ylva Jung, Jonas Fritzin, Martin Enqvist, Atila Alvandpour, "Least-Squares Phase Predistortion of a +30dBm Class-D Outphasing RF PA in 65nm CMOS", IEEE Transactions on Circuits and Systems Part 1, 60(7): 1915-1928, 2013.
- Lyamin, N., A. Vinel, M. Jonsson, and J. Loo, "Real-time detection of Denial-of-Service attacks in IEEE 802.11p vehicular networks," IEEE Communications Letters, accepted for publication and available online.
- S. Khoshfetrat Pakazad, M. S. Andersen, A. Hansson, A. Rantzer, Decomposition and projection methods for distributed robustness analysis of interconnected uncertain systems. 13th IFAC Symposium on Large Scale Complex Systems: Theory and Applications, 2013.
- M. S. Andersen, A. Hansson, S. Khoshfetrat Pakazad, A. Rantzer, Distributed robust stability analysis of interconnected uncertain systems. 51st IEEE Conference on Decision and Control, 2012.
- M. S. Andersen, S. Khoshfetrat Pakazad, A. Hansson, A. Rantzer, Robust stability analysis of sparsely interconnected uncertain systems. Provisionally accepted to appear in IEEE Transactions on Automatic Control.
- S. Khoshfetrat Pakazad, M. S. Andersen, A. Hansson, Distributed solutions for loosely coupled feasibility problems using proximal splitting methods. Provisionally accepted to appear in Optimization Methods and Software.
- S. Khoshfetrat Pakazad, H. Ohlsson, L. Ljung, Sparse Control Using Sum-Of-Norms Regularized Model Predictive Control, 52nd IEEE Conference on Decision and Control, 2013.
- A. Levinshtein, C. Sminchisescu, S. Dickinson. Multiscale Symmetric Part Detection and Grouping. International Journal of Computer Vision, 104(2): 117-134 (2013).
- S. Mathe and C. Sminchisescu. Action from Still Image Dataset and Inverse Optimal Control to Learn Task Specific Visual Scanpaths. In Advances in Neural Information Processing Systems (NIPS), December 2013.
- E. Marinoiu, D. Papava, and C. Sminchisescu. Pictorial Human Spaces. How Well do Humans Perceive a 3D Articulated Pose? In International Conference on Computer Vision (ICCV), December 2013.
- M. Leordeanu, A. Zanfir, and C. Sminchisescu. Locally Affine Sparse-to-Dense Matching for Motion and Occlusion Estimation. In International Conference on Computer Vision (ICCV), December 2013.
- M. Zanfir, M. Leordeanu, and C. Sminchisescu. The Moving Pose: An Efficient 3D Kinematics Descriptor for Low-Latency Action Recognition and Detection. In International Conference on Computer Vision (ICCV), December 2013.
- F. Li, J. Carreira, G. Lebanon and C. Sminchisescu. Composite Statistical Inference for Semantic Segmentation. In IEEE Conference on Computer Vision and Pattern Recognition (CVPR), June 2013.





- S. Mathe and C. Sminchisescu. Dynamic Eye Movement Datasets and Learned Saliency Models for Visual Action Recognition. In European Conference on Computer Vision (ECCV), October 2012.
- J. Carreira, R. Caseiro, J. Batista, and C. Sminchisescu. Semantic Segmentation with Second-Order Pooling. In European Conference on Computer Vision (ECCV), October 2012.
- M. Leordeanu, R. Sukthankar, and C. Sminchisescu. Efficient Closed-Form Solution to Generalized Boundary Detection. In European Conference on Computer Vision (ECCV), October 2012.
- E. Bazavan, F. Li, and C. Sminchisescu. Fourier Kernel Learning. In European Conference on Computer Vision (ECCV), October 2012.
- M. Feyh, and K. Petersen, "Lean Software Development Measures and Indicators: a Systematic Mapping Study", Proceedings of the Lean Enterprise Software and Systems Conference (LESS 2013); Galway, Ireland; 2013.
- R. Jabangwe, K. Petersen and D. Smite, "Visualization of Defect Inflow and Resolution Cycles: Before, During and After Transfer", Proceedings of the 20th Asia-Pacific Software Engineering conference (APSEC 2013); Bangkok, Thailand; 2013.
- S. Barney, V. Mohankumar, P. Chatzipetrou, A. Aurum, C. Wohlin and L. Angelis, "Software Quality Across Borders: Three Case Studies on Company Internal Alignment", to appear in Journal of Information and Software Technology, Vol. 56, No. 1, 2014.
- A. Corazza, S. Di Martino, F. Ferrucci, C. Gravino, F. Sarro and E. Mendes, "Using Tabu Search to Configure Support vector Regression for Effort Estimation", Empirical Software Engineering: An International Journal, Vol.18, No. 3, pp. 506-546, 2013.
- M. Riaz, E. Tempero, M. Sulayman and E. Mendes, " Maintainability Predictors for Relational Database-driven Software Applications: Extended Results from a Survey", International Journal of Software Engineering and Knowledge Engineering, Vol. 23, No. 2, pp. 1-16, 2013.
- H. Beohar and M.R. Mousavi. Input-Output Conformance Testing Based on Featured Transition Systems. Proceedings of 29th ACM Symposium on Applied Computing, Software Verification and Testing (ACM SAC-SVT 2014), ACM Press, 2014.
- N. Noroozi, M.R. Mousavi, and T.A.C. Willemse. On the Complexity of Input Output Conformance Testing. Proceedings of the 10th International Symposium on Formal Aspects of Component Software (FACS 2013), Nanchang, China, Lecture Notes in Computer Science, Springer, 2013.
- S. Keshishzadeh, A. Mooij, and M.R. Mousavi. Early Fault Detection in DSLs using SMT Solving and Automated Debugging. Proceedings of the 11th International Conference on Software Engineering and Formal Methods (SEFM 2013), Madrid, Spain, volume 8137 of Lecture Notes in Computer Science, pages 182--196, Springer, 2013.
- M. Garrido and J. Grajal, "Continuous-flow variable-length memoryless linear regression architecture", accepted to Electronics Letters.
- H. Johansson and A. Eghbali, "Add-equalize structures for linear-phase Nyquist FIR filter interpolators and decimators," accepted to IEEE Trans. Circuits Syst. I: Regular Papers.



- A. Eghbali, T. Saramäki, and H. Johansson, "Conditions for Lth-band filters of order  $2N$  as cascades of identical linear-phase FIR spectral factors of order  $N$ ," accepted to Signal Processing.
- A. Eghbali and H. Johansson, "A class of reconfigurable and low-complexity two-stage Nyquist filters," accepted to Signal Processing.

## Keynotes and Invited Talks:

- David Broman. Keynote speaker at the Fourth International Symposium on Highly Efficient Accelerators and Reconfigurable Technologies (HEART 2013), June 13-14, 2013, Edinburgh, Scotland. Title: Execution time should be as short as possible, but not shorter.
- Anthony Ephremides (LiU/ISY) gave a 2-day PhD short course on "Capacity, Throughput, Stability: Ultimate Rate Limitation of Wireless Networks" at ITN-LiU in October; 17 PhD students and postdocs attended from the ELLIIT consortium and other Swedish and Danish Universities.
- Alexander Kleiner (LiU/IDA) has given a number of invited lectures and keynotes recently:
  - Cooperative Robotics - Invited Talk at University of Southern California (USC), Los Angeles, CA, USA.
  - Cooperative Robotics - Invited Talk at IRobot Corporation, Pasadena, CA, USA.
  - Smarter Robots for Search and Rescue - Invited Keynote Speaker during the Workshop on Advanced Technologies for Disaster Management, Ankara, Turkey.
  - From "Joysticked" Rescue Robots towards Collaborative Robotics - Invited Keynote Speaker at IROS 2013 SU-WS-02 From Remotely-Controlled to Autonomous-Collaborative Robots, Tokyo, Japan.
  - Cooperative Robotics - Invited Talk at the Bremen University, Faculty of Computer Science, Bremen, Germany.
  - Cooperative Robotics - Invited Talk at the Vienna University of Technology, Institute of Information Systems, Vienna, Austria.
  - Cooperative Robotics - Invited Keynote Speaker at the Graz University, Faculty of Computer Science, Graz, Austria.
- Cristian Sminchisescu (LU/Mathematical Imaging Group) presented the keynote "Actions in the Eye: from Hollywood to Sports, Vision in Sports", CVPR 2013, Portland.
- Cristian Sminchisescu (LU/Mathematical Imaging Group) presented the keynote "Human Actions and 3D Pose in the Eye: From Perceptual Evidence to Accurate Computational Models", Challearn, ICMI2013, Sydney
- Emilia Mendes (BTH) is a keynote speaker at the 3rd International Conference on Web Engineering and Applications (ICWA 2013), to be held in December 2013.
- Jörn Janneck (LU/CS) gave an invited talk at the 2013 Electronic System Level Synthesis Conference, June 2013, Austin, TX
- Jörn Janneck (LU/CS) gave an invited talk at Advanced & Futuristic ICT & Biomedical Technologies Symposium, October 2013, National Cheng Kung University, Tainan, Taiwan



## Awards and Appointments:

- Patrick Doherty (LiU/IDA) received the Åke Svensson research award from SAAB for his contributions in autonomous UAVs. The award was presented at the European aerospace conference CEAS in Linköping 16-19 September. [More information is available here.](#)
- Alexander Kleiner (LiU/IDA) was nominated for the best paper award by the reviewers of the 11th IEEE International Symposium on Safety, Security, and Rescue Robotics (SSRR-2013). However, Kleiner decided to withdraw from the award due to personal involvement in the organization.
- Taimoor Abbas (LU/EIT) got a best paper award at 13th International Conference on ITS Telecommunications for the paper: T. Abbas, A. Thiel, T. Zemen, C. F. Mecklenbräuker, F. Tufvesson: Validation of a Non-Line-of-Sight Path-Loss Model for V2V Communications at Street Intersections, 13th International Conference on ITS Telecommunications, Tampere, Finland, 2013-11-05.
- Best paper award at the 8th International Conference on Software Engineering and Applications Conference (ICSOFT-EA) for the paper "Using Expert-based Bayesian Networks as Decision Support Systems to Improve Project Management of Healthcare Software Projects" authored by Emilia Mendes (BTH).

## Some new dissertations:

- TVK Chaitanya at LiU/ISY/Communication systems graduated (Ph.D. Sept 2013: title "HARQ Systems: Resource Allocation, Feedback Error Protection, and Bits-to-Symbol Mappings") and joins McGill University, Canada, as postdoc. Read his Ph.D. dissertation here: <http://liu.diva-portal.org/smash/get/diva2:640306/FULLTEXT01.pdf>
- Antonios Pitarokolis at LiU/ISY/Communication systems defended his licentiate thesis "On the performance of Massive MIMO systems with single carrier transmission and phase noise. Read the thesis here: <http://liu.diva-portal.org/smash/get/diva2:647960/FULLTEXT01.pdf>
- Ylva Jung, "Estimation of Inverse Models Applied to Power Amplifier Predistortion", Linköping Studies in Science and Technology. Licentiate Thesis. No. 1605, 2013.
- Defense of Doctoral Dissertation Nov 22: Integrated Requirements Engineering - Understanding and Bridging Gaps within Software Development (Elizabeth Bjarnason, LU/CS)

## Program chairs and Editorships:

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

- David Broman and Gabor Karsai. Co-chairs of the 4th Analytic Virtual Integration of Cyber-Physical Systems Workshop (AVICPS 2013), December 3, 2013, Vancouver, Canada. Co-located with RTSS 2013.
- The 5th SNOW (Systems and Networks Optimization for Wireless) Workshop, Apr. 2-4 2014, Åre, is organized jointly by ITN-LiU and EIT-LUND with Di Yuan (ITN-LiU) and Björn Landfeldt (EIT-LUND) co-chairing. Scott Fowler (ITN-LiU) is publicity co-chair, while Anthony Ephremides, Vangelis Angelakis, and Sara M. Razavi of LiU/ITN are the organizing committee. Submission deadline is Dec. 8th. More information at <http://snow.itn.liu.se>





- Vangelis Angelakis (LiU/ITN) has become editor for Journal of Communications and Networks in the area of Network Optimization.
- Alexander Kleiner (LiU/IDA) successfully concluded as General Chair together with Fredrik Heintz (LiU/IDA) as Program Chair the 11<sup>th</sup> IEEE International Symposium on Safety, Security, and Rescue Robotics (SSRR-2013). The symposium together with the Rescue Camp (Summer School) took place at Linköping University 10/21-26 <http://www.ssrr-conference.org/2013/>. The symposium hosted 8 invited speakers, 36 participants in the camp, and 100 participants during the symposium coming from Asia, US, and Europe. The symposium finally reached the highest submission rate of all SSRR events in the past and received consistently positive feedback from the participants and invited speakers.
- Dr. Kai Petersen (BTH) co-organizes the 1st International Workshop on Estimations in the 21st Century Software Engineering (together with Dr. Cigdem Gencel and Dr. Luca Santillo). The workshop is co-located with the 15th International Conference on Agile Software Development (XP 2014) in Rome, Italy.
- Prof. Jürgen Börstler is guest editor of a special issue of ACM Transactions on Computing Education on the theme "Team Projects in Computing Education, more information: <http://toce.acm.org/specialissues.html>
- Jörn Janneck (LU/CS) was elected to serve as member of the Technical Committee on "Design and Implementation of Signal Processing Systems" of the IEEE Signal Processing Society for the term from 2014-2016.
- Jörn Janneck (LU/CS) was appointed Technical Area Chair for "Architecture and Implementation" of the Asilomar Conference on Signals, Systems and Computers 2014

#### Patents:

- J. Carreira, R. Caseiro, J. Batista, and C. Sminchisescu. Second-order Pooling Descriptors for Semantic Segmentation, patent filed October 2013.

## Personalförändringar

### Emil Björnson new ELLIIT assistant professor

Emil Björnson (currently with KTH & SUPELEC, France) has accepted an appointment as ELLIIT-assistant professor at LiU/ISY/Communication systems

### Mario Garrido to Electronic Systems, Linköping

Dr. Mario Garrido has been recruited as associate professor/senior lecturer to the Division of Electronics Systems, Department of Electrical Engineering at Linköping University. Dr. Garrido received the MSc and PhD degrees from Technical University of Madrid (UPM) in 2004 and 2009,



respectively. His research interest is in the systematic mapping of algorithms to hardware with a focus on FFTs and data stream reordering. Since 2010 he has been a post-doctoral researcher at Linköping University.

## Forskningsfinansiering

- Several ELLIIT researchers received project grants or junior project grants from the Swedish Research Council (VR) in the 2013 call. Some of these are:
  - Martina Maggio (LU/AC) - Power and temperature control for large-scale computing infrastructures – 3,96 MSEK
  - Michael Lentmaier (LU/EIT) - Spatially Coupled Turbo-Like Codes – 3,88 MSEK
  - Viktor Öwall (LU/EIT) - Implementation of Faster-than-Nyquist Signaling - From Theory to Silicon – 3,45 MSEK
  - Di Yuan (LiU/ITN) - How to Empty the Queues Fast? - New Perspectives of Fundamental Performance Analysis of Wireless Networks via Mathematical Programming" – 2,9 MSEK.
  - Christian Sminchisescu (LU/Mathematical Imaging Group) - Human Sensing in natural Environments - 2,9 MSEK
  - Peter Fritzson (LiU/IDA) – Integrated Debugging and Requirement-Based Fault Analysis in Equation-Based Simulation Models – 2,52 MSEK
  - Jimmy Johansson (LiU/ITN) – A user-centered information visualization framework for detecting and exploring change in high-dimensional temporal data – 3,36 MSEK
- Dr. Daniel Persson at LiU/ISY/Communication systems wins a CENIIT grant for research on hardware aspects of massive MIMO systems
- The EU ICT-FP7-Smartcities project RERUM started in September, with a kickoff meeting in Heidelberg Germany. RERUM stands for "Reliable, Resilient and secUre IoT for sMart city application" and involves 12 partners from the EU Academia and Industry and two Smart Cities (Heraklion, Greece and Tarragona, Spain) that will host the project trial deployments. Linköping University participates with ITN and the Scientist in Charge is Vangelis Angelakis (LiU/ITN).
- Within the area of vehicular communication Fredrik Tufvesson (LU/EIT) has started a larger joint project, WCAE - Wireless Communication in Automotive Environment, in the Vinnova FFI-program. In the project they will study emerging and existing wireless communication technologies for the automotive environment. Those will facilitate wireless communication with the vehicle from the early birth of the vehicle during manufacturing through normal operation to aftermarket services. The project takes a holistic approach on wireless communication in automotive environments. Lund University researchers will work together with a former ELLIIT researcher, now at AB Volvo, an ELLIIT industrial PhD student from Volvo Car Cooperation and researchers from Kapsch TrafficCom, SP, Actia and Mecel.



# ELLIIT



Excellence Center at Linköping – Lund in Information Technology

- The Division of Electronic Devices, LU/ ISY received two of VINNOVA's "Banbrytande ICT" grants through the proposals SEHPMET (Atila Alvandpour) and 'Effektförstärkare för WLAN och nya komponenter" (Ted Johansson). For more information see <http://www.vinnova.se/sv/Aktuellt--publicerat/Pressmeddelanden/2013/131108-Banbrytande-kunskap-inom-informations--och-kommunikationstekik-/>