SICS OPEN HOUSE
2014

27 MARCH 2014

MORNING SESSION

TRACK 1

TRACK 2

9:00-9:45
WELCOME TO SICS OPEN HOUSE 2014, CHRISTER NORSTRÖM, CEO

DATACENTERS - AN OPPORTUNITY FOR SWEDEN, TOR BJÖRN MINDE

Sweden is an ideal destination for datacenters. Clean, stable energy production, cool climate, flexible business environment, mission-critical infrastructure, high ICT competence, political and geo-stability are all key success factors. Sweden can play an important role in the zettabyte era and research and innovation are vital to seize the opportunity.

Tor Björn Minde, head of research strategies at Ericsson Research and part time at Luleå Technical University, will describe the market and technology situation and a strategy for the Northern region of Sweden.

EIT ICT Labs

SICS Open House is arranged in cooperation with EIT ICT Labs.

10:00-10:15 PREDICT THE FUTURE BY ANALYZING THE BUZZ, MALIN STRÅHLE, GAVAGAI

Sensefish by Gavagai provides a leading web application for real time media monitoring and text analysis across all languages. Sensefish delivers actionable insights related to what people say and feel about brands, products or services, or any other types of topics. Sensefish is based on groundbreaking text analysis technology from SICS.

10:15-11:15 FOUR ASPECTS OF THE INTERNET OF THINGS
- Privacy, Markus Bylund
- Big Data, Daniel Gillblad
- Security, Christian Gehrmann
- Application, Joakim Eriksson

11:15-11:30 IMPROVING EDUCATION BY INTEGRATING ONLINE AND IN-CLASS LEARNING, DAVID BLACK-SHAFFER, UPPSALA UNIVERSITY
SICS is working with Uppsala University and KTH to drive the adoption of online education technologies, to improve the quality of education and to make high quality courses available to more students and to life-long learners in industry.

11:30-11:45 THE DARK AGE IS COMING - DARK SILICON AND ITS IMPLICATIONS MATS BRORSSON, SICS AND KTH
The same fundamental limits to single-core scaling that led to the over-night transition to multicore processors will soon also limit the ability to add more cores to processors. Already a significant part of transistors must be powered off to be able to utilize the full speed potential of the processors. These unpowered transistors are referred to as Dark Silicon.

10:00-10:15 FUN CONTROL ROOM SOLUTIONS FOR SMART PEOPLE, SUSANNE TIMSJÖ, ABB
Susanne Timsjö, Manager, ABB Corporate Research, Software Architecture and User Experience.

ABB and SICS have built and deployed "one-function tech probes" in a control room at KVV in Västerås. The task was to explore ways of engaging, inspiring, and keeping control room workers on their toes in their working environment.

10:15-10:30 NÄSTA STEG FÖR PROCESSINDUSTRIN MED AUTOMATION OCH IT, ANDERS OE JOHNSSON
Anders OE Johansson, SICS Västerås, programchef för det Strategiska innovationsprogrammet PiiA, Processindustriell IT och Automation, berättar vilka satsningar som görs med fokus på automation och IT för att stärka svensk processindustri, dess leverantörer och akademin.

10:30-10:45 THE WALL IN THE SMART HOME, JONAS SÖDERBERG
The Wall is SICS Swedish ICT's way of making a physical test and development environment for "smart home" technology. It is designed primarily for the integration of technology and services in smart energy, home automation and e-health. The Wall consists of modules that represent walls or parts of walls in a normal home.

10:45-11:00 INTERACTIVE REMOTE STROKE REHABILITATION, PÄR HANSSON
We are investigating the possibility of improving the access and quality of rehabilitation using concrete technology prototypes. The overall aim is to develop an interactive system based on modern ICT which will work as a meaningful support tool during the rehabilitation process following a stroke.

11:00-11:15 MANAGING THE NEXT GENERATION OF NETWORKS, REBECCA STEINERT
Seamless operation across heterogeneous networks, real-time adaptability to varying networking conditions, continuous service delivery and user connectivity at all times. Developing network management key-concepts and approaches together with the telecom industry and academia, SICS is leading the way towards efficient management systems enabling the next-generation networks and networking.

11:15-11:30 DETECTING SUSPECT BEHAVIOR AT SEA - THE RESULTS, ANDERS HOLST
The three-year SADV project, with the goal of detecting vessels with anomalous behaviors at sea, was finished in 2013. We have developed a framework for combining statistical and rule based anomaly detection, and evaluated it on data including real incidents at sea. In this presentation we will show examples of different interesting situations that can be detected.

11:30-11:45 BETTER SOLUTION FOR CREDIT RISK VALUATION, MARTIN NILSSON
SICS has found a very efficient solution to a classical mathematical problem, known as the "first-passing time to a moving boundary" for certain stochastic processes. It is about finding the probability distribution for the time these processes cross a given, time-variable boundary. We found the solution through our work in neurobiophysics, but the problem has applications in many other areas, e.g. in financial mathematics, for credit risk valuation.

EXHIBITION & MINGLE

**12:00-17:00 LUNCH EXHIBITION & MINGLE
AT SICS SWEDISH ICT**
Kistagången 16/Isafjordsgatan 22, 6 fl

Knuth

von
Neumann

Reception

Entrance
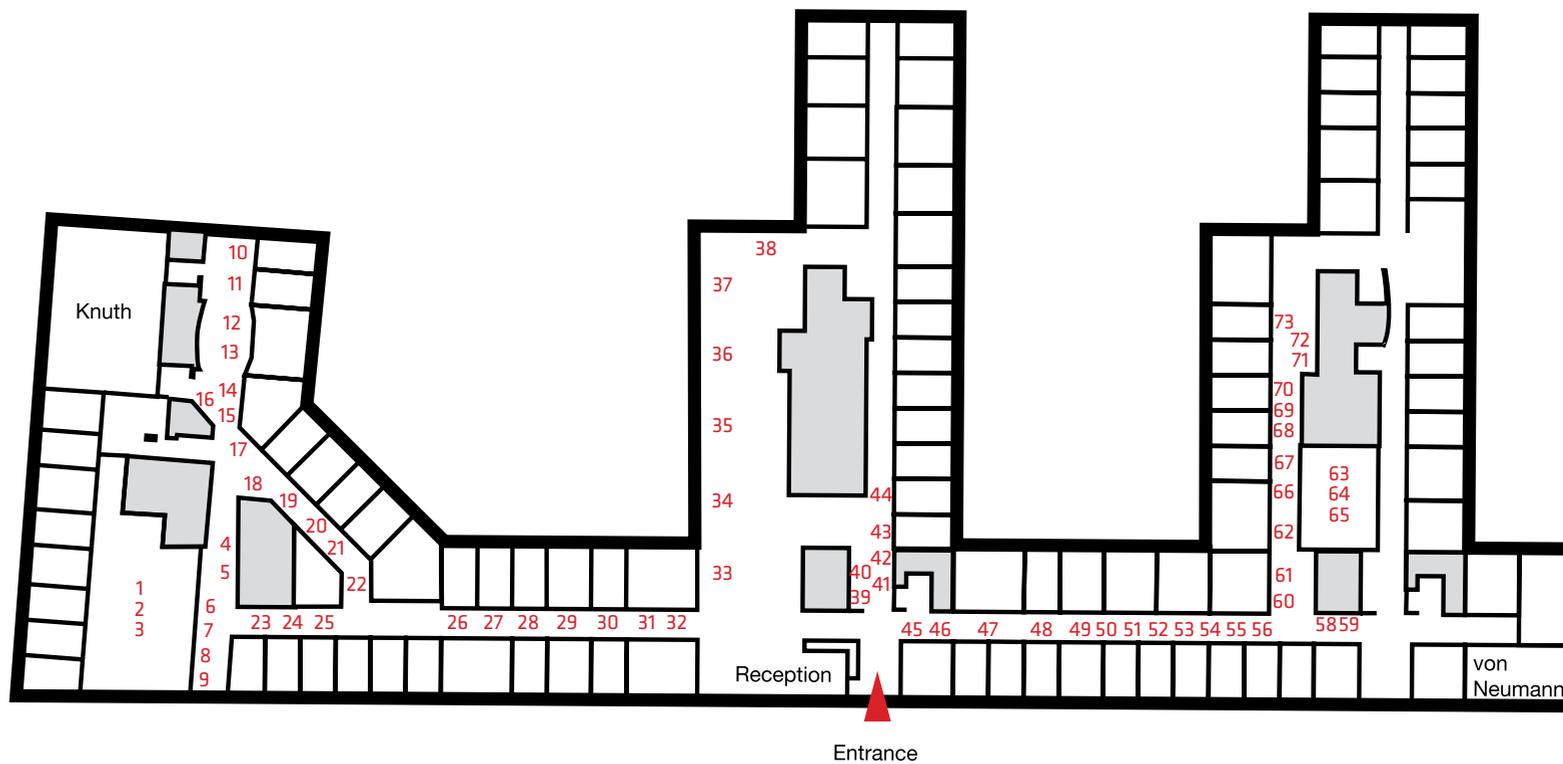
1 THE "WALL"
The "Wall" is a simulated home, facilitating design activities of IT in home settings as well as integration of network and communication protocols. The installation consists of modules that together give an impression of a home-like environment with doors, windows and other typical interior details. The IT installation, ranging from fiber into the home to individual sensors are real installations, providing a realistic facility for technical integration.
Contact: Jonas Söderberg, jas@sics.se and Markus Bylund, bylund@sics.se

2 DELETE BY HAIKU
We use poetry to create beautiful remains of your SMS yard. Haiku is a very short form of Japanese poetry. Text messages are containing memories of relations and events in life. "Delete by Haiku" is a mobile application that allows you to delete text messages, but keep the memories.
Contact: Elsa Vaara, elsa@sics.se

3 PROBING ENJOYMENT @ WORK
Control rooms do not have a reputation as being fun places: engineers watch over machinery as processes unfold. Usually, companies seek to make these workspaces better by improving ergonomics or usability of interfaces. Recently, ABB invited Mobile Life to bring play into a control room at a power plant in Västerås. Three digital "probes" were introduced to spur the operators' reactions and ideas.
Contact: Petra Sundström, petra@sics.se and Jarmo Laaksolahti, jarmo@sics.se

4 SOMAESTHETICS - TECHNOLOGY FOR THE HUMAN BEING
Interaction design researchers at SICS and Mobile Life are interested in technology that support users to increase their body awareness, learn new bodily movements, new ways of breathing, or more pleasurable and aesthetically interesting ways of using your body. They base their design on a practice named Feldenkrais.
Contact: Johanna Mercurio, johmerc@sics.se

5 INSPIRATIONAL BITS
The inspirational bits project is about shaping a material library and platform that can expose and make dynamical properties of digital materials - tangible, visible, articulated and ultimately understandable for interaction designers and other members of a design team. Furthermore, this project has strong ties to the emerging internet of things vision from a user experience centered perspective. In this demo we will show the insbits.com portal, insbits studio and how smartphones and low-powered arduino boards can be used to seamlessly explore and quickly set up interaction design explorations or small scale Internet of Things - environments.
Contacts: Jarmo Laaksolahti, jarmo@sics.se, Jordi Solsona Belenguer, jordisb@kth.se, jordisb@kth.se, and Mattias Jacobsson, majac@sics.se

6 INDOOR AND OUTDOOR SOCIAL ALARM – A PROTOTYPE
Physical activity and social contacts are important for health and disease prevention – improved quality of life. A growing elderly population and limited resources require new technical solutions for elderly people to feel safe outdoors. A prototype for a social alarm that handles both indoor and outdoor environments in the same alarm solution has been developed within the TRYGGVE project.
Contact: Anneli Avatare Nõu, anneli@sics.se

7 REMOTE STROKE REHABILITATION
The "Solutions for Remote Interactive Stroke Rehabilitation and Progress Tracking in Home Environments" project investigates the possibility of improving the access and quality of rehabilitation using concrete technology prototypes. The overall aim is to develop an interactive system based on modern ICT which will work as a meaningful support tool during the rehabilitation process following a stroke.
Contact: Marie Sjölinder, marie@sics.se and Pär Hansson, par@sics.se

8 THE HEALTH DIARY – TELE-HEALTH FOR THE "DIGITAL ILLITERATE"
The Health Diary – a tele-health solution for inclusion of the "digital illiterate", supporting heart failure and COPD patients and their care providers in specialised homecare through the use of a system based on digital pen technology. The tele-health system provides the care providers with frequent PROMs on various symptoms and measurement data for the detection of early signs of deterioration.
Contact: Leili Lind, leili.lind@liu.se

9 TAKING CARE OF CHRONICALLY ILL PATIENTS OVER THE NET
COPD (KOL) is a lung disease that causes considerable suffering for those afflicted. In Sweden it is estimated that between 400,000 and 700,000 people have COPD. Taking care of these patients on a distance at their homes through advanced communications and measuring different parameters around them is a great possibility. In this project we develop a complete solution for taking care of patients at home.
Contact: Per-Olof Sjöberg, pos@sics.se

SICS SPIN OFFS
THIS SECTION (10-17) OF THE EXHIBITION PRESENTS SOME OF SICS SPIN OFF COMPANIES!

10 LOCUSENSE
LOCUS is a SICS technology for indoor positioning and asset tracking. It is based on angle-of-arrival information (AoA) between wireless sensor nodes, and estimation by recursive filters. Antennas like SPIDA from SICS can provide AoA. The method is distributed, converges quickly and stability is guaranteed. No calibration is needed. LocuSense is a spin-off from SICS with the purpose to commercialize the LOCUS technology. It is hosted by the SICS Startup Accelerator.
Web: www.LocuSense.se
Contact: Göran Olofsson, CEO
gorano@sics.se

11 WEMEMOVE
WEMEMOVE is developing a motion classification engine for sports and wellbeing that answers the questions what are you doing, and how are you doing it. Our system uses just one sensor, either a smartphone or a HR-chestbelt. This is done through machine learning algorithms classifying and quantifying your movement. Collective movement data from yourself and elite-athletes powers a big-data analysis tool that enables personal learning. WEMEMOVE´s first product is a XC-skiing service called mySKILAB.
Web: www.wememove.com
Contact: Magnus Jonsson, magnus@tii.se

12 ELSIP - MULTICORE MADE EASY
What if your multicore needs could be easily fulfilled? With a global address space, for easy and straightforward software design. With easily synchronized distributed memories. And real-time functionality, as well as the possibility to add your own hardware functions in a Zynq FPGA. This is exactly what Elsip offers. We call it the Zynchronizer. Elsip is a spinoff from KTH's Electronic System Design department, and a company in the SICS Startup Accelerator.
Web: www.elsip.se
Contact: Adam Edström, adam@elsip.se

13 PEERIALISM
Peerialism is an R&D driven company developing large scale distributed systems for streaming, media distribution, caching and storage. Its flagship product is Hive Streaming, a solution for live video streaming over private networks and for streaming over internet. The company, which is a spin-off from SICS, is selling its products in the European and US markets with a special focus on Fortune 500 companies. Its customer and partner base includes Ericsson, Microsoft and Time Warner Cable.
Web: www.hivestreaming.com
Contact: Todd Törnquist,
todd.tornquist@hivestreaming.com

14 BIOSYNC TECHNOLOGY
"BRINGING LIFE-CHANGING IMPACT THROUGH WEARABLE BIO-SENSOR TECHNOLOGIES".
Biosync Technology is a spin-off company from SICS with a strong focus on Innovation and R & D, in order to combine Biosensors and Data Analysis with the help of a unique Algorithm and User Interface. The system is a tool for stress measurement and self-reflection and has great potential to improve the quality of life.
Contact: Björn de Jounge,
bjorndejounge@gmail.com

15 WIND RIVER SIMICS
Wind River Simics simulates the full target system to create a shared platform for software development. It allows you to break the rules of software development through groundbreaking debugging techniques, on-the-fly test and integration, and mechanisms for collaboration. With ubiquitous access to the shared platform, everyone sees the same thing, work is parallelized, tasks are automated, and product schedules shift left. Wind River's parent company acquired the SICS spin-off Virtutech and the Simics product line. The continued development of Simics is now done by Wind River.
Web: www.windriver.com/simics
Contact: Katarina Martinsson,
katarina.martinsson@windriver.com

16 THE JOICECARE VIDEO COMMUNICATION SOLUTIONS
JoiceCare sells video communication solutions for the elderly and handicapped. Night Peace is a service for users who need supervision or additional care and security in their homes. The service uses one or several motion-sensitive cameras to enable remote and secure supervision. Joice is a user-friendly video phone that will provide easy access to family, friends and care professionals. The company started as a project at SICS.
Web: www.myjoice.se/en
Contact: Emmanuel Frécon,
emmanuel@sics.se,

17 GAVAGAI
Gavagai's product Sensefish monitors social and editorial media in order to detect topics and track consumer sentiment. Sensefish is based on research done at SICS, from which the company spun off in 2008.
Web: www.gavagai.se
Contact: Niklas Rudemo, niklas@sics.se

18 LIGHTWEIGHT TRACING ON MULTICORE
In order to understand the performance of multicore applications it is useful to be able to observe their execution. This can be done by instrumenting the program with trace points and capture the sequence of trace points (with time stamps) executed by the program. We have developed a low-overhead multicore tracing system which compresses the trace events in memory, allowing the capture of more detailed traces.
Contact: Karl-Filip Faxén, kff@sics.se

19 PAPP: PORTABLE AND PREDICTABLE PERFORMANCE ON HETEROGENEOUS EMBEDDED MANYCORES
The ARTEMIS project PaPP aims to achieve predictable performance portability of software running on different platforms. We focus on performance analysis modelling for task-based parallel applications within multicore systems. Our modelling targets to find out minimal resources to satisfy performance requirements of an application and develop task scheduling strategies as an input to run-time for better resource management and performance optimization.
Contact person: Mats Brorsson,
matsbror@sics.se

20 PORTABLE AND EFFICENT DIGITAL SIGNAL PROCESSING ALGORITHMS

High-level languages allow programmers to succinctly express algorithms that we can reason about, but the resulting executables are often inefficient. We show that algorithms can be portably and concisely expressed in a high-level domain specific language and still result in efficient executables.
Contact person: Peter Jonsson, pj@sics.se

21 TASK-PARALLEL EXECUTION ON FPGA:S

Generic accelerators such as GPUs are the de-facto number-crunchers for parallel applications today. However, GPUs, due to their generic design, are inadequate when performance requirements tighten. In such cases, synthesizing the application down to specific hardware can be a viable solution. We use re-configurable FPGAs (Field-Programmable-Gate-Arrays) technology to demonstrate a protoype tool-chain that enables execution of task parallel workloads on application-specific hardware.
Contact person: Artur Podobas, podobas@kth.se

22 ONLINE PROFILING FOR AUTOMATIC VM RECONFIGURATION AND CLOUD LOAD BALANCING

We present a framework for online profiling of virtual machines for dynamic resource management in the cloud. The profiler runs within the Virtual Machine and gathers performance counter data; it uses them to extract behavioral patterns and recognize alarming situations that raise respective events. There are two reaction layers to these events. First there's an opportunity for inter VM reconfiguration by invoking dynamic recompilation for running applications; the second layer involves the hypervisor for VM deployment reconfiguration.
Contact person: Georgios Varisteas, yorgos@kth.se

23 CALIPSO: CONNECT ALL IP-BASED SMART OBJECTS

The Internet of Things, connecting the physical world to the digital world, enables important applications such as Smart Infrastructures, Smart Cities, and Smart Toys. In the EU-funded CALIPSO project, we design novel methods to attain very low power consumption in IP-connected networks of smart objects – a necessary step towards widespread adoption.
Contact: Beshr Al Nahas, beshr@sics.se, Simon Duquennoy, simonduq@sics.se

24 RICH: RELIABLE IP FOR TIME SYNCHRONIZED CHANNEL HOPPING NETWORKS

The IEEE has proposed a Time-Synchronized Channel Hopping (TSC) MAC as part of the 802.15.4e standard. In the EIT-funded RICH project, we investigate how to connect TSCH to the IETF the low-power IPv6 stack (RPL/6LoWPAN). We implement TSCH in Contiki and TinyOS and propose practical solutions for schedule allocation and interaction with the routing layer, with a focus on smart energy use cases.
Contact: Beshr Al Nahas, beshr@sics.se, Simon Duquennoy, simonduq@sics.se

25 EVARILOS: EVALUATION OF RF-BASED INDOOR LOCALIZATION SOLUTIONS FOR THE FUTURE INTERNET

The EU project EVARILOS addresses two of the major problems of indoor localization research: Reproducibility and comparability of research results suffering from uncontrolled RF interference. We also investigate how indoor localization can be made more robust to interference by using multiple localization modalities, and how external interference can be used to increase localization accuracy.
Contact: Niklas Wirström, niwi@sics.se; Thiemo Voigt, thiemo@sics.se

26 RELYONIT: RESEARCH BY EXPERIMENTATION FOR DEPENDABILITY ON THE INTERNET OF THINGS

Environmental conditions, such as temperature, humidity, radio interference affect the performance of Internet of Things applications. Existing Internet of Things applications cannot provide dependable performance under varying environmental conditions. Six European organizations work together in the RELYonIT project to provide a systematic framework and a tool chain to enable Internet of Things applications to provide dependable performance under varying, and often hostile, environmental conditions.
Contact: Nicolas Tsiftes, nvt@sics.se; Chamath Keppitiyagama, chamath@sics.se; Thiemo Voigt, thiemo@sics.se

27 ASYMMETRIC SECURITY IN THE INTERNET OF THINGS: BSD IMPLEMENTATION AND EVALUATION OF ELLIPTIC CURVE CRYPTOGRAPHY IN CONTIKI

The Internet of Things is mainly composed by devices that usually have important power and memory restrictions. Therefore, protocols have to be twisted to adapt to these situations. Elliptic Curve Cryptography (ECC) shows up as an alternative to RSA by achieving the same level of security as RSA algorithms with less number of bits, implying faster, and less power-consuming schemes providing the same security.
Contact: Oriol Piñol, oriol@sics.se

28 DIRECTIONAL COMMUNICATION IN WIRELESS SENSOR NETWORK

Directional communication can improve the performance of wireless protocols because of the reduced contention. Our results show in a multi-hop network directional communication reduces contention significantly. This allows the use of one wireless channel for packet forwarding and also allows forwarding of a burst of packets using disjoint paths to double the sink throughput.
Contact: Ambuj Varshney, ambuj.varshney@it.uu.se, Thiemo Voigt, thiemo@sics.se

29 SPECKSENSE: DETECTING MULTIPLE SOURCES OF INTERFERENCE IN THE 2.4 GHZ SPECTRUM

Interference from WiFI and Bluetooth in the 2.4 GHz band affects the quality of service for most WSN applications. Interference classification is therefore, a prerequisite towards mitigation. We present SpeckSense, a service that detects multiple interferers, namely WiFi beacons and Bluetooth traffic. We implement SpeckSense on real hardware and use it to recommend interference-free channels.
Contact: Venkat Iyer, venkatraman.iyer@it.uu.se

30 SUPPORTING HETEROGENEOUS OPTICAL DATA LINKS

Visible light communication offers a potential complement to RF communication. However, heterogeneity in cameras quality leads to different channel qualities. This work's core idea is to encode data into an image's frequency representation rather than into pixels. We have successfully transmitted data using a prototype system and are currently investigating appropriate channel models.
Contact: Liam McNamara, ljjm@sics.se

### 31 IOTBRIDGE - DAMAGE DETECTION AND MONITORING FOR RAILWAY BRIDGES

SICS together with academic and industrial partners are developing a new system for data acquisition for bridge deployments. Different sensor data will be analysed to generate early damage warnings, drastically reducing maintenance costs. Task-optimized data collection and efficient integration with customer side support systems are key points to be shown.
Contact: Joel Höglund, joel@sics.se

32 TOWARDS TCP COMMUNICATION WITH THE LOW-POWER WIRELESS BUS

The poor performance of TCP over wireless and lossy links has hindered its use in low power networks. The Low-Power Wireless Bus (LWB) offers high reliable and low latency communication in IEEE 802.15.4 networks. In this work, we argue that TCP can be used to provide reliable connectivity between sensor nodes in an LWB-based sensor network and external Internet hosts.
Contact: Kasun Hewage, kasun.hewage@it.uu.se, Venkat Iyer, venkatraman.iyer@it.uu.se, Thiemo Voigt, thiemo@sics.se

33 SECTHINGS: AN OPEN SENSOR CLOUD PLATFORM FOR THE INTEROPERABLE INTERNET OF THINGS
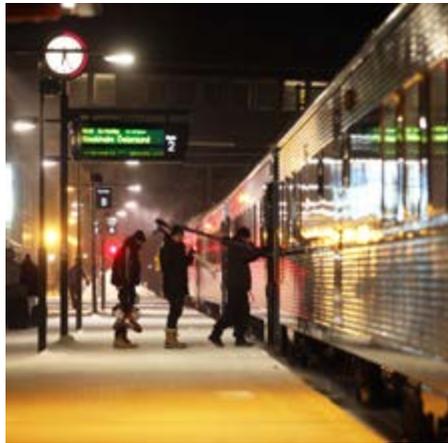
The objective of this VINNOVA-funded project is to make the development and deployment of new, innovative Internet of Things products and services significantly easier and more standardised than today. We provide a toolchain that includes the Contiki OS (IoT firmware), Internet of Things device emulators and simulators, gateway software, and sensor cloud software.
Contact: Thiemo Voigt, thiemo@sics.se, Liam McNamara, ljjm@sics.se, Joakim Eriksson, joakime@sics.se

34 CLOUDBERRY DATA CENTERS IN LULEÅ

Facebook has recently established one of the world's largest data centers in Luleå and preparations are under way with several additional data center operators in the Norrland coast region. Objectives of the project Cloudberry Data Centers (or just 'Cloudberry') is to catalyze national growth by initiating an attractive and efficient environment for integrated education, research, design and innovation (ERDI) in the area of resource-efficient large-scale and 'green' handling of large volumes of data with a primary focus on 'cloud' in data centers.
Contact: Tor Björn Minde, tor.bjorn.minde@ericsson.com

35 IMPROVING EDUCATION BY INTEGRATING ONLINE AND IN-CLASS LEARNING

SICS is working with Uppsala University and KTH to drive the adoption of online education technologies, to improve the quality of education and to make high quality courses available to more students and to life-long learners in industry. We will demonstrate our Flipped Classroom teaching tool Scalable Learning, which is used by over a thousand students in courses at ten universities in Sweden and worldwide.
Contact: Sverker Janson, sverker@sics.se

36 IMPROVE YOUR TECHNIQUE IN GOLF OR RUNNING THROUGH REAL-TIME FEEDBACK

Real-time feedback is on way for athletes to practice and improve their technique in various sports. We present two systems that give real-time feedback to athletes. One is giving audio feedback on the golf swing and the other is visualizing running. The systems are based on light-weight sensors and mobile phones and can be tried out in the exhibition.
Contact: Stina Nylander, stny@sics.se

37 ANY DEVICE, ANY SERVICE, ANY BUSINESS MODEL

Internet of Things is promising a salvation in smart services and connected devices. But the fact is that data still hides in silos due to business models and service ownership. The Intelligent energy services project at SICS and SUST aims to open up a secure way of federation between any device and any business model without a need for a "clearing house". We are deploying 30 houses with integrated services and smart energy, view the houses in action at the demo.
Contact: Joakim Eriksson, joakime@sics.se, Emmanuel Frécon, emmanuel@sics.se

38 OPENING UP THE AUTOSAR STANDARD TO PLUG-IN SOFTWARE

Standardization and flexibility are keys to successful competition. This has led to the AUTOSAR automotive software standard and the trend of connected vehicles. We work on opening up AUTOSAR-based systems to adding 3rd-party software at runtime, thus creating opportunities for vehicle federations. The ideas are implemented in an open-source lab environment, consisting of a model car, equipped with Raspberry Pi control units and relevant sensors.
Contact persons: Avenir Kobetski, avenir@sics.se and Ze Ni, ze.ni@sics.se

39 EMULINK: INTEGRATING COOJA AND EMUL8

Emulink allows the integration of Cooja with Emul8, an emulator for Cortex M3 and other ARM-based platforms. It is integrated in Cooja for simulations with STM32W based nodes. The combination of Emulink, Cooja, and Emul8 provides a complete Internet of Things testing tool.
Contact: Joakim Eriksson, joakime@sics.se, Niclas Finne, nfi@sics.se

40 THE YANZI INTERNET OF THINGS DEVELOPMENT KIT

Yanzi has designed and developed a set of products including a smart-plug with both metering capability and a relay, and an dimmable LED lamp. These products are running Contiki OS and uIPv6 and are packaged in a new Internet of Things development kit. This development kit enables development of Contiki-based Internet of Things applications. The devices are programmed using over-the-air reprogramming.
Contact: Joakim Eriksson, joakime@sics.se, Niclas Finne, nfi@sics.se

MASTER THESIS WORK
THIS SECTION (41-46) OF THE EXHIBITION SHOWS SOME OF OUR HARD WORKING MASTER STUDENTS' ONGOING WORK.

41 INTEGRATION OF BLE PROTOCOL IN CONTIKI OS
This Master thesis project aims to add the Bluetooth Low Energy (BLE) protocol in Contiki. BLE is a low-power and low-cost solution in mobile devices for control and monitoring applications especially in the healthcare, fitness and security industry. Additionally, experiments will be done with RIME protocol running on BLE & 802.15.4 platform to compare data rate, latency, energy consumption and reliability.
Contact: Simon Duquennoy, simonduq@sics.se and student Prithvi Raj Narendra, prithvi@sics.se

42 SECURITY FOR BILLIONS OF DEVICES
Objects are connected to the Internet of Things using micro-controllers, that have limited memory space and computational power. As a result, access control protocols, that were designed for general purpose computers are not suitable for Internet of Things. We demonstrate additional security modes for CoAP that aim to provide an access control solution that is secure but at the same time suitable for highly constrained devices.
Contact: Ludwig Seitz, ludwig@sics.se, and student Denis Sitenkov

43 RUNNING WITH INTERACTION TO ENHANCE THE EXPERIENCE
Most running applications are good for documentation and comparison but what we don't see that much of is technology that will enhance the experience while running. This project will look at what two extreme groups of runners, night and trail runners, find important in their running and what experiences they seek. Based on that, the project seeks to sketch out a number of design briefs for how a keep-fit-runner can experience similar things, without necessarily running in the dark or on trails.
Contact: Mattias Jacobsson, majac@sics.se and student Lidija Murselovic, lidijam@mobilelifecentre.org

44 MOBILE OPPORTUNISTIC SERVICES FOR EXPERIENCE SHARING (MOSES)
The MOSES project uses a combination of opportunistic and infrastructure based communication to enhance sharing of information between users to improve the experience of users at large events. In this project, we develop a prototype based on the NetInf architecture to demonstrate the benefits of the MOSES system.
Contact: Anders Lindgren, andersl@sics.se and students Imal Sakhi och Pourya Moradinia

45 PORTING AN AUTOSAR-COMPLIANT OPERATING SYSTEM TO A HIGH PERFORMANCE EMBEDDED SYSTEM
In this work, experiences from porting an AUTOSAR real-time operating system to a high performance embedded system, Raspberry Pi, are collected. The goal is both to present experience on the process of AUTOSAR porting and to create an AUTOSAR implementation on a cheap and widely accessible hardware platform, making AUTOSAR available for researchers and students.
Contact persons: Avenir Kobetski, avenir@sics.se, and student Shuzhou Zhang.

46 PRIVACY RISK ASSESSMENT OF SMART HOME APPLICATIONS
We investigate privacy assessment methodologies suitable for the goal of identifying privacy risks in smart home applications. We argue for an approach that considers context and understands the dynamic nature of the privacy problems from the users and stakeholders' perspective. The goal is to shape system behavior by systematically assessing potential privacy risks in a case-by-case basis for the elicitation of privacy requirements.
Contact persons: Pedro Sanches, sanches@sics.se, and student José Felix Cantarell

47 VIRTUAL MACHINES ON TRUSTED HOSTS
Public cloud computing has brought a convenient way to acquire computing resources.
However, software vulnerabilities abound in the whole stack – from the virtual machine host BIOS, to the binary of the virtual machine image used by the client.
We demonstrate the launch of a virtual machine instance on a verified host, known to have a certain software configuration – unmodified by malware.
Contact: Nicolae Paladi, nicolae@sics.se

48 INFRACLOUD, PROTECTION FOR IAAS
Malware is a serious problem preventing financial, healthcare and public administration institutions from reaping the benefits of the public IaaS model. InfraCloud, a collaboration project between SICS, the Region of Skåne and Ericsson Research, aims to address part of this problem. Based on technologies such as the Trusted Computing, we are working on a prototype deployment of a medical journal management system in an IaaS environment, with a special focus on the integrity of the platform BIOS, host software configuration, network isolation and storage protection.
Contact: Christian Gehrmann, chrisg@sics.se

49 EIT ICL LABS – FROM RESEARCH TO BUSINESS
EIT ICT Labs' mission is to drive European leadership in ICT innovation for economic growth and quality of life. By linking education, research and business development, EIT ICT Labs empowers ICT top talents for the future and brings ICT innovations to life. EIT ICT Labs' partners represent global companies, leading research centres and top ranked universities in the field of ICT.
SICS is a core partner to EIT ICT Labs and is co-located with the EIT ICT Labs Stockholm Node.
Web: www.eitictlabs.eu
Contact: Marianne Loor, marianne.loor@eitictlabs.eu, Björn Hovstadius, bjorn@swedsoft.se

50 SWEDSOFT – ENABLING INDUSTRY TRANSFORMATION
Software development is a key enabling technology for innovation. It's a big part of Sweden's economy, accounting for 11% in terms of product and service production – more than twice the EU average. Software development has had a hugely positive effect on job creation, with 15,000 new jobs during the last few years. The industry needs to improve, however, in how to increase productivity in research and development – the focus of Swedsoft and its innovation agenda.
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51 PROMPT – ADVANCED EDUCATION TO SECURE THE ACCESS TO SOFTWARE PROFESSIONALS

Through the PROMPT project, we intend to establish a national training initiative with the goal of ensuring the supply of advanced software-related skills and innovation in Swedish industry. PROMPT is an open initiative that welcomes the participation of other companies and institutions in addition to those already involved. A special focus is on effective methods for flexible learning enabling participation independent of time and space.

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52 ECOFES - PRODUCT DEVELOPMENT AND OPEN INNOVATION FOR ECOSYSTEMS OF EMBEDDED SYSTEMS

EcoFES involves the future development of embedded systems that increasingly fosters connected services. Product development is driven by openness and innovation which form new ecosystems. It supports new business roles, processes, methods, tools and quality assurances to enable rapid collaborative and parallel ways of development, adaptations after production and responding to fluid market needs.

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53 PERSONALISED CONTINUOUS SOFTWARE ENGINEERING

The project supports software organizations to continuously develop, release and learn from rapid cycles. This requires teams to be motivated, empowered, self-organized and equipped with the right prerequisites. To increase work quality and collaboration, the personalities and cognitive characteristics of team members are employed to investigate task execution accuracy, satisfaction and effectiveness.

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54 TECHNOLOGY INTELLIGENCE FOR VEHICLE ELECTRONIC SYSTEMS

SICS provides the Swedish automotive industry with quarterly updates on the latest technologies within vehicle electronic systems and software. The theme for each newsletter is decided by the industrial partners, and so far newsletters have been published on sensors, big data, and continuous deployment of software. Upcoming themes are systems-of-systems, and virtualized testing.

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55 PINT - PARALLEL INTEGRATION TESTING

PINT aims to facilitate parallel testing of vehicular systems, to achieve increased test efficiency and effectiveness. We investigate whether parallel execution of tests may reduce testing time, while increasing fault detection and behavioural coverage of the system under test. PINT's results will be supported by tools, and will be evaluated in a case study at Scania's full vehicle testing lab.

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56 ALCEA: THE ARCHITECTURE LIFE-CYCLE EFFECT ANALYSIS METHOD

ALCEA is a method to evaluate a proposed new architecture for a large scale industrial system. The method estimates how the new system will perform in all its different life-cycle phases. The results of the method can be directly used as part of a business case, and provides support for validation through a sensitivity analysis. We provide detailed examples where the method has been applied in the evolution of embedded systems.

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57 CANCELLED

58 JABEJA: A DISTRIBUTED ALGORITHM FOR BALANCED GRAPH PARTITIONING

Graph processing has become an integral part of big data analytics. With the ever increasing size of the graphs, one needs to partition them into smaller clusters that can be processed on multiple machines or in a distributed fashion. We propose a massively parallel and self-organizing algorithm, called JabeJa, that uses local search and simulated annealing techniques to solve this problem.

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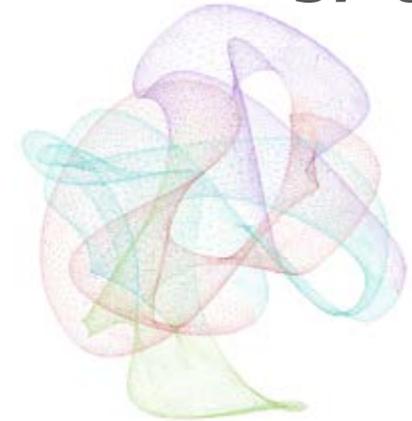
59 LARGE-SCALE CROSS-DOCUMENT COREFERENCE RESOLUTION

When one comes across Mercury in the context of the solar system, they instantly know it is Mercury, the planet, and not the chemical element. Such a disambiguation, or Coreference, is a rather easy task for humans, but a complex one for a computer. We presents a highly parallel solution to this problem, which is based on a novel algorithm for community detection in large scale graphs.

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60 THE HADOOP OPEN PLATFORM

The Hadoop Open Platform (HOP) is a new distribution of Hadoop, based on Hadoop 2.2. It is a new more scalable, user friendly distribution of hadoop. It supports:

- A relational meta-data store, with an implementation using MySQL Cluster.
- Platform-as-a-Service support for creating/managing clusters
- A Dashboard for monitoring and managing the cluster

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61 UNISON: ASSEMBLY CODE GENERATION USING CONSTRAINT PROGRAMMING

We demonstrate Unison - a simple, flexible and potentially optimal code generator that solves interdependent code generation tasks together using constraint programming. We show how Unison takes into account the task interdependencies and their combinatorial nature to improve the quality of the code generated by LLVM (a state-of-the-art compiler) for Hexagon (a mobile platform processor).

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62 WELCOME TO A COURSE IN DATA INTENSIVE COMPUTING AT SICS!
A course in Data Intensive Computing will be given at SICS by Dr. Amir H. Payberah in April 2014. Send an email to kersti@sics.se if you want to participate!

In this course, we will cover a wide variety of advanced topics in big data analytics and data intensive computing, including:

- Storage and NoSQL databases, e.g., HDFS and HBase
- Resource management, e.g., YARN and Mesos
- Execution engines, e.g., MapReduce, Spark/RDD, and Nephele/PACT
- Query/scripting languages, e.g., Hive and Shark
- Streaming processing, e.g., Spark Streaming
- Graph processing, e.g., Pregel, GraphLab, PowerGraph and GraphX
- Machine learning, e.g., MLBase.
- We will introduce three main big data frameworks, which are Hadoop, Spark, and Stratosphere, and present the Spark framework in detail.

Contact: Amir H. Payberah, amir@sics.se

63 DETECTING SUSPECT BEHAVIOR AT SEA - THE RESULTS
The three-year SADV project, with the goal of detecting vessels with anomalous behaviour at sea, was finished in 2013. We have developed a framework for combining statistical and rule based anomaly detection, and evaluated it on data including real incidents at sea. In this demo we will show examples of different interesting situations that can be detected.
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64 A TOOLBOX FOR INDUSTRIAL AUTOMATION
Industrial processes continuously produce huge amounts of data. Such data streams are used to monitor, control and refine the automation process. The STREAM project develops a toolbox for analysis, diagnostics, optimization and planning from streaming data. Our methods are exemplified in cases from ABB, Prevas, and Bombardier.
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65 WHAT'S THE STATE OF LAKE MÄLAREN TODAY?
Access to clean water is important for people's health and for industrial processes. The SENSATION project develops new solutions for quicker and better detection of water contamination. Surveillance of water supplies such as Lake Mälaren is one example of a service using online water quality information. The project has more than 20 partners and is led by Acreo.
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66 DIRECT IN-NETWORK LOCALIZATION OF PERFORMANCE DEGRADATIONS
In network topologies consisting of active measurement end-points and passive intermediate nodes, localization of performance degradations is complicated, as it requires expensive, dedicated probing equipment. We have developed a decentralized approach to direct localization of performance degradations, based on deriving individual link statistics from successive incremental probe measurements.
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67 DISTRIBUTED IN-NETWORK MONITORING AND TROUBLESHOOTING IN SOFTWARE-DEFINED NETWORKS
Software-defined networking (SDN) and network virtualization enable flexible deployment of service chains, capable of scaling dynamically with changing network conditions. Within the UNIFY-project we are currently developing monitoring and troubleshooting approaches based on probabilistic network management applied in SDNs.
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68 REAL-TIME IN-NETWORK ANALYTICS IN TELECOM CLOUDS
Next-generation telecom and Internet services will execute on telecom clouds, which will combine the flexibility of today's computing clouds with the service quality of telecom systems. In the REALM-project, we develop components for real-time service assurance within telecom clouds, based on in-network analytics, machine learning and probabilistic modeling.
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69 SCALABLE LIVE TV DISTRIBUTION USING NETINF TO ANDROID DEVICES
We demonstrate efficient live TV distribution over the Internet using a NetInf information-centric networking prototype. NetInf's in-network caching serves both as redistribution points to many receivers, and enable time-shifted viewing without burdening the server side.
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70 CACHE ARCHITECTURES FOR SERVER OFFLOAD IN MEDIA DISTRIBUTION
Cache placement policies have been up for debate in the scientific community recently, and there is some controversy over the utility of pervasive caching. We've investigated the results of a few of the recent studies using a simulation approach and will report preliminary results on the conditions under which different caching placement and sizing policies makes most sense.
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71 CALCULATE YOUR RISK!
When uncertainties are not properly taken into account, we expose ourselves to unknown risks. Does my system have sufficient capacity? Is the response time within the bounds? Calculations based on averages can be grossly misleading. SICS has developed a method and a programming language, Tilde, which makes it very easy to provide precise estimations of errors even for advanced calculations.
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72 OPTIMIZATION TECHNIQUE FOR LASER-CUTTING SYSTEMS
Tomologic is a company that offers an optimization technique to reduce the amount of waste in the sheet metal cutting industry. Over the years, SICS has worked closely with Tomologic to develop a software-based tool that automates their optimization technique for laser-cutting systems. A number of mathematical constraint models for possible placements of parts form the foundation of the product. Testing has shown a material waste reduction above 10%, a time reduction by 20% and significant energy savings.
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73 ADDING TRAINS TO AN EXISTING TIMETABLE
The tool SICSten demonstrates the use of computerized optimization techniques and is designed to support adding trains to an existing timetable. Besides being able to find a feasible train path quickly, thereby saving the planner valuable time, the tool enables the user to evaluate the consequences of the available choices.
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