EDCC

12th European Dependable Computing Conference

Gothenburg, September 5-9, 2016

SERENE WORKSHOP

8th International Workshop on Software Engineering for Resilient Systems

September 5-6

CARS WORKSHOP

4th International Workshop on Critical Automotive Applications: Robustness & Safety

September 6

Photo: Superstudio D&D/Göteborg & Co

Monday September 5
SERENE Workshop

08:00 - 09:00 Registration

09:00 - 09:15 Opening

09:15 - 10:30 Invited talk

Traffic safety – a boundary condition for autonomous driving

Dr. Anna Nilsson-Ehle, SAFER – Vechicle and Traffic Safety Centre at Chalmers University of Technology, Sweden

10:30 - 11:00 Coffee

11:00 - 12:30 Session 1: Mission-critical systems

A Framework for Assessing Safety Argumentation Condence

Rui Wang, Jérémie Guiochet and Gilles Motet, LAAS-CNRS, Universite de Toulouse, CNRS, INSA, UPS, Toulouse, France

Configurable Fault Trees

Christine Jakobs, Peter Tröger and Matthias Werner, Operating Systems Group, TU Chemnitz, Germany

A Formal Approach in Designing Reliable Advisory Systems

Luke Martin and Alexander Romanovsky, Centre for Software Reliability, School of Computing Science, Newcastle University, Newcastle-upon-Tyne, UK

12:30 - 14:00 Lunch

14:00 - 15:00 Session 2: Verification

Verifying Multi-core Schedulability with Data Decision Diagrams

Dimitri Racordon and Didier Buchs, Centre Universitaire d'Informatique, University of Geneva, Switzerland

Formal verification of the on-the-fly vehicle platooning protocol

Piergiuseppe Mallozzi, Massimo Sciancalepore and Patrizio Pelliccione, Chalmers University of Technology and University of

15:00 - 15:30 Coffee

15:30 - 17:00 Panel Do the autonomous systems jeopardize the safety?

Prof. Devdatt Dubhashi, Chalmers University of Technology, Sweden
Prof. Estevam R. Hruschka Jr., Carnegie Mellon University, USA, and Federal University of Sao Carlos (UFSCar), Brazil
Dr. Anna Nilsson-Ehle, Director of SAFER – Vehicle and Traffic Safety Centre at Chalmers University of Technology, Sweden
Prof. Hans Hansson, Mälardalen University, Sweden

17:45 - 18:45 Visit to ReVeRe, Chalmers Vehicle Research lab

19:00 - 20:00 Reception, L's Resto, Lindholmen

Tuesday September 6
SERENE Workshop

08:30 - 09:15 Registration

09:15 - 10:30 Invited talk

Challenges in functional safety for future cooperative and autonomous systems

Prof. Hans Hansson, Mälardalen University, Sweden

10:30 - 11:00 Coffee

11:00 - 12:30 Session 3: Engineering resilient systems

WRAD : Tool Support for Workflow Resiliency Analysis and Design

John Mace, Charles Morisset and Aad Van Moorsel, School of Computing Science, Newcastle University, Newcastle upon Tyne, UK

Designing a Resilient Deployment and Reconguration Infrastructure for Remotely Managed Cyber-Physical Systems

Subhav Pradhan, Abhishek Dubey and Aniruddha Gokhale, Department of Electrical Engineering and Computer Science, Vanderbilt University, Nashville, TN, USA

cloud-ATAM: Method for Analysing Resilient Attributes of Cloud-Based Architectures

David Ebo Adjepon-Yamoah, Centre for Software Reliability, School of Computing Science, Newcastle University, UK

12:30 - 14:00 Lunch

14:00 - 15:00 Session 4: Testing

Automated Test Case Generation for the CTRL Programming Language Using Pex: Lessons Learned

Stefan Klikovits, Université de Genève, Centre Universitaire d'Informatique, Carouge, Switzerland and CERN, European Organization for Nuclear Research, Geneva, Switzerland, David PY Lawrence, Université de Genève, Centre Universitaire d'Informatique, Carouge, Switzerland, Manuel Gonzalez-Berges, CERN, European Organization for Nuclear Research, Geneva, Switzerland, Didier Buchs, Université de Genève, Centre Universitaire d'Informatique, Carouge, Switzerland

A/B Testing in E-commerce Sales Processes

Konstantinos Koukouvis, Roberto Alcañiz Cumero and Patrizio Pelliccione, Chalmers University of Technology and University of Gothenburg, Sweden

15:00 - 15:30 Closing

Monday, September 5, 2016.
Seminar
Dependable Computing in Practice. Success Stories and Future Challenges.

13.00 - 14.30 Session 1: Space and Automotive Systems

Computers in Space, Today and Tomorrow
Torbjörn Hult, RUAG Space AB.

On the Design of Safety-Critical Automotive Systems
Per Johannessen, AB Volvo

From Autonomous Space Launchers to Self-driving Cars
Rolf Johansson, SP, Technical Research Institute of Sweden

14.30 – 15.00 Coffee

15.00 - 16.00 Session 2: Dependable Avionics

The Gripen Fly-By-Wire system – Architectural Principles and Dependability Testing
Lars Holmlund, Saab AB, Linköping

Challenges in designing dependable avionics
Kristina Forsberg, Saab AB, Jönköping

16:00 – 16.15 Short Break

16.15 - 17.15 Session 3: Testing and Benchmarking

Why Dependability Benchmarks Do Not Work for Dependable Systems and What Can Be Done About It
Henrique Madeira, University of Coimbra, Portugal

Software Dependability through Automated Testing
Robert Feldt, Blekinge Institute of Technology, Sweden

17:45 - 18:45 Visit to ReVeRe, Chalmers Vehicle Research lab
19:00 - 20:00 Reception, L's Resto, Lindholmen

CAN WE TRUST COMPUTERS TO CONTROL CRITICAL SYSTEMS?

Jan Torin

Photo by Jan-Olof Yxell

In this seminar, speakers from industry and academia will share their experiences and discuss challenges in designing computer systems for critical applications, such as autonomous road vehicles, airplanes and space missions.

The seminar is dedicated to professor emeritus Jan Torin, who celebrated his 80th birthday in June this year. Jan was a professor of computer engineering at Chalmers from 1984 to 2001, where he founded the dependable computing research lab.

He successfully supervised 20 doctoral students, four of whom are speakers at this seminar. Prior to joining Chalmers, he work at Saab Space (now Ruag Space) where he led the development of on-board computers for the Ariane launchers and several satellites.

Tuesday, September 6, 2016
CARS Workshop

08:00 - 09:00 Registration

08:45 - 09:00 Welcome address

09:00 - 09:45 Invited talk

Challenges in Architecture for Self-driving Cars

Mathias Westlund Systems and functions architect, Autonomous drive, Volvo Car Group.

09:45 - 10:35 Session 1 – Autonomous Vehicles

Session Chair: Rolf Johansson, SP Technical Research Institute of Sweden, Boras, Sweden

Autonomous vehicles Disarming the Trolley Problem –
Why Self-driving Cars do not Need to Choose Whom to Kill

Rolf Johansson (SP) and Jonas Nilsson (Volvo Cars), Sweden

Risk reduction of experimental autonomous vehicles: The Safety-Bag approach

Brini Manel, Crubille Paul and Lussier Benjamin (Université de Technologie de Compiègne), France

Q&A – discussion - 10min

10:35 - 11:00 Break

11:00 - 12:30 Session 2 – Architechting Automotive Systems

Session Chair: Jean-Charles Fabre, LAAS-CNRS / INPT, Toulouse, France

Service-based Modeling of Cyber-Physical Automotive Systems: A Classification of Services

Patrik Feth and Rasmus Adler (Fraunhofer IESE), Germany

Multiplexing Adaptive with Classic AUTOSAR? Adaptive Software Control to Increase Resource Utilization in Mixed-Critical Systems

Angeliki Kritikakou (IRISA), Claire Pagetti (ONERA), Christine Rochange (IRIT), Michael Lauer and Matthieu Roy (LAAS-CNRS), France

Domain-Specific Languages for the Definition of Automotive System Requirements

Florian Bock (Computer Science 7, FAU Erlangen), Sebastian Siegl (Audi AG) and Reinhard German (Computer Science 7, FAU Erlangen), Germany

Virtual Integration on the Basis of a Structured System Modelling Approach

Henrik Kaijser, Henrik Lonn and Peter Thorngren (Volvo Group), Sweden

Q&A – discussion - 10min

12:30 - 14:00 Lunch

14:00 - 15:30 Session 3 – Safety Analysis and Robustness

Session Chair: Philippe Quéré, TCR, Renault SA, Paris, France

Automotive Software Architecture Views and Why we need a new one - Safety view

Miroslaw Staron (University of Gothenburg), Sweden

Toward an MDD-based Analysis of Stateful and Variant-rich Automotive Functions

Michael Käßmeyer, Rüdiger Berndt (Audi AG), Peter Bazan and Reinhard German (Friedrich-AlexanderUniversität, Erlangen-Nürnberg), Germany

Towards certification of software-intensive mixed-critical systems in automotive industry

Peter Reichenpfader, Florian Pölzbauer and Mario Driussi (Kompetenzzentrum - Das virtuelle Fahrzeug, Forschungsgesellschaft mbH), Austria

Automated Freedom from Interference Analysis for Automotive Software

Florian Leitner-Fischer(ZF TRW Automotive GmbH), Stefan Leue and Sirui Liu (University of Konstanz), Germany

Q&A – discussion - 10min

15:30 - 16:00 Break

16:00 - 17:30 Session 4 – Development Process and Techniques

Session Chair: Mario Trapp, Fraunhofer IESE, Kaiserslautern, Germany

Development process and techniques Towards Shaping ISO 26262-compliant
Resources for OSLC-based Safety Case Creation

Barbara Gallina, Julieth Patricia Castellanos Ardila (Mälardalen University) and Mattias Nyberg (Scania CV), Sweden

Towards Flexible and Dependable E/E-Architectures for Future Vehicles

Gereon Weiss, Philipp Schleiss and Christian Drabek (Fraunhofer ESK),Germany

Provisioning of Deterministic and Non-Deterministic Services for Vehicles: The Rubus Approach

Harold Lawson (Lawson Konsult AB), Saad Mubeen, Alessio Bucaioni, Jukka Mäki-Turja (Mälardalen University), John Lundbäck, Mattias Gålnander, Kurt-Lennart Lundbäck (Arcticus Systems), and Mikael Sjödin (Mälardalen University), Sweden

Academic-industrial Collaboration in the Vehicle Software Domain:
Experiences and End-user Perspective

Saad Mubeen, Jukka Mäki-Turja (Mälardalen University), John Lundbäck, Mattias Gålnander, Kurt-Lennart Lundbäck (Arcticus Systems), Mikael Sjödin (Mälardalen University) and Harold Lawson (Lawson Konsult), Sweden

Q&A – discussion - 10min

18:00 - 19:00 Visit to ReVeRe, Chalmers Vehicle Research lab

Wednesday, September 7, 2016
EDCC

08:00 - 09:00 Registration

09:00 - 09:15 Welcome Address
Johan Karlsson (General Chair), and Marco Vieira (Program Chair)

09:15 - 10:30 Keynote
Speed, Data and Ecosystems: The Future of Software Engineering
Jan Bosch, Chalmers University of Technology

Abstract: The future of software engineering is centered around three main developments: Speed, Data and Ecosystems. The focus on speed is concerned with the constantly increasing rate of deploying new software in the field. This continuous integration and deployment is no longer only the purview of internet companies but is also increasingly deployed in embedded systems. Second, data is concerned with the vast amounts of information collected from systems deployed in the field and the behavior of the users of these systems.
The software-intensive systems industry needs to significantly improve its ability to exploit the value present in that data. Finally, ecosystems are concerned with the transition in many companies from doing everything in-house to strategic use of innovation partners and commodity providing partners. The keynote addresses these three main developments, provides numerous examples from the Nordic and international industry and predicts the next steps that industry and academia need to engage in to remain competitive.

10:30 - 11:00 Coffee

11:00 - 12: 30 Best Paper Session
Session Chair: Marco Vieira

Finding Resilience-Friendly Compiler Optimizations using Meta-Heuristic Search Techniques
Nithya N, Karthik Pattabiraman and Matei Ripeanu (University of British Columbia (UBC), Canada)

Diversity, Safety and Security in Embedded Systems: modeling adversary effort and supply chain risks
Ilir Gashi, Andrey Povyakalo and Lorenzo Strigini (City University London, U.K.)

A System-level Architecture for Fine-grained Privacy Control in Location-based Services
Arielle Moro and Benoît Garbinato (University of Lausanne, Switzerland)

12:30 - 14:00 Lunch

14:00 - 15:30 Software Security
Session Chair: Elena Troubitsyna

Software Metrics and Security Vulnerabilities: Dataset and Exploratory Study
Henrique Alves [1], Baldoino Fonseca [1] and Nuno Antunes [2] ([1] Federal University of Alagoas, Brazil; [2] University of Coimbra, Portugal)

Coverage Metrics and Detection of Injection Vulnerabilities: An Experimental Study
Ana Paula Sayuri Matsunaga [1], Nuno Antunes [2] and Regina Moraes [3] ([1] CPqD, Brazil; [2] University of Coimbra, Portugal; [3] University of Campinas, Brazil)

Inferring a Distributed Application Behavior Model for Anomaly Based Intrusion Detection
Eric Totel [1], Mouna Hkimi [2], Michel Hurfin [2], Mourad Leslous [2] and Yvan Labiche [3] ([1] CentraleSupelec, France; [2] INRIA, France; [3] Carleton University, Canada)

15:30 - 16:00 Coffee

16:00 - 17:00 Fault Tolerance
Session Chair: Paolo Lollini

CrossCheck: a Holistic Approach for Tolerating Crash-Faults and Arbitrary State Corruptions
Arthur Martens [1], Christoph Borchert [2], Manuel Nieke [1], Olaf Spinczyk [2] and Rüediger Kapitza [1] ([1] TU Braunschweig, Germany; [2] TU Dortmund, Germany)

SAREK: Optimistic Parallel Ordering in Byzantine Fault Tolerance
Bijun Li [1], Wenbo Xu [1], Muhammad Zeeshan Abid [2], Tobias Distler [3] and Rüdiger Kapitza [1] ([1] TU Braunschweig, Germany; [2] KTH Stockholm, Sweden; [3] Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU), Germany)

17:00 - 18:00 Student Forum
Session Chair: Hans Peter Schwefel

Adaptive Data Collection Mechanisms for Smart Monitoring of Distribution Grids
Mohammed S. Kemal and Rasmus L. Olsen (Aalborg University, Denmark)

Delay Evaluation of OpenFlow Network Based on Queueing Model
Zhihao Shang and Katinka Wolter (Freie Universität Berlin, Germany)

Improving FPGA resilience through Partial Dynamic Reconfiguration
José Luís Nunes (University of Coimbra, Portugal)

18:30 - 20:00 Welcome Reception, Restaurant Bistrot, Jupiter Building

Thursday, September 8, 2016
EDCC Conference

08:00 - 08:30 Registration

08:30 - 10:30 Hardware Dependability

Session Chair: Johan Karlsson

On the Effects of Cumulative SEUs in FPGA-based Systems
Jose Luis Nunes [1], Joao Carlos Cunha [1] and Mario Zenha-Rela [2] ([1] Polytechnic Institute of Coimbra, Portugal; [2] University of Coimbra, Portugal)

3D-DPS: An Efficient 3D-CAC to Reliable Data Transfer in 3D ICs
Zahra Shirmohammadi, Nezam Rohbani and Seyed Ghassem Miremadi (Sharif University of Technology, Iran)

Ultrafast Error Correction Codes for Double Error Detection/Correction
Luis-J. Saiz-Adalid, Pedro Gil, Juan Carlos Ruiz, Joaquin Gracia, Daniel Gil and Juan C. Baraza (Universitat Politècnica de València, Spain)

Investigating the Effects of Process Variations and System Workloads on Reliability of STT-RAM Caches
Elham Cheshmikhani, Amir Mahdi Hosseini Monazzah, Hamed Farbeh and Seyed-Ghasem Miremadi (Sharif University of Technology, Iran)

10:30 - 11:00 Coffee

11:00 - 12:30 Testing

Session Chair: Nuno Antunes

Practical Emulation of Software Defects in Source Code
Gonçalo Pereira, Raul Barbosa and Henrique Madeira (University of Coimbra, Portugal)

Prediction of the Testing Effort for the Safety Certification of Open-Source Software: A Case Study on a Real-Time Operating System
Domenico Cotroneo [1], Domenico Di Leo [2], Roberto Natella [1] and Roberto Pietrantuono [1] ([1] Università degli Studi di Napoli Federico II, Italy; [2] Critiware, Italy)

Virtual Worlds for Testing Robot Navigation: a Study on the Difficulty Level
Thierry Sotiropoulos, Jérémie Guiochet, Félix Ingrand and Hélène Waeselynck (LAAS-CNRS, France)

12:30 - 14:00 Lunch

14:00 - 15:00 Data Storage

Session Chair: Karthik Pattabiraman

Experimental Assessment of NoSQL Databases Dependability
Luis Ventura and Nuno Antunes (University of Coimbra, Portugal)

Design and Implementation of a Consistent Data Store for a Distributed SDN Control Plane
Fabio Botelho [1], Tulio A. Ribeiro [1], Paulo Ferreira [1], Fernando M. V. Ramos [2] and Alysson Bessani [2] ([1] LaSIGE, Portugal; [2] Universidade de Lisboa, Portugal)

15:00 - 16:00 Fast Abstracts

Session Chair: Gilles Tredan

A Combined Dependability and Security Approach for COTS Software in Space Systems
David Escorial Rico, Mark Hann

Efficient non-anonymous composition operator for modeling complex dependable systems
Silvano Chiaradonna, Felicita Di Giandomenico and Giulio Masetti

Estimating Maximum Error Impact in Dynamic Data-driven Applications for Resource-aware Adaption of Software-based Fault-Tolerance
Björn Bönninghoff, Horst Schirmeier

Towards Dependable Change Management and Traceability for Global Software Development
David Ebo Adjepon-Yamoah

DETOx: Towards Optimal Software-based Soft-Error Detector Configurations
Michael Lenz and Horst Schirmeier

MISO: an intermediate language to express parallel and dependable programs
Alcides Fonseca, Raul Barbosa

17:00 - Excursion and banquet
The banquet will be held at Nya Älvsborgs Fortress, located on a small island in the mouth of the Göta Älv river.

Friday, September 9, 2016
EDCC Conference

08:30 - 09:00 Registration

09:00 - 10:30 Short papers

Session Chair: Regina Moraes

Assuring Dependable Cloud-Based System Engineering: A Cloud Accountability Method
David Ebo Adjepon-Yamoah [1] and Zhenyu Wen [2] ([1] Newcastle University, U.K.; [2] University of Edinburgh, U.K.)

Expert-Guided Automatic Diagnosis of Performance Problems in Enterprise Applications
Christoph Heger [1], André van Hoorn [2], Dušan Okanović [1], Stefan Siegl [1] and Alexander Wert [1] ([1] NovaTec Consulting GmbH, Germany; [2] University of Stuttgart, Germany)

Towards a Common Safety Ontology for Automobiles and Railway Vehicles
Bernhard Hulin [1], Hermann Kaindl [2], Thomas Rathfux [2], Roman Popp [2], Edin Arnautovic [2] and Roland Beckert [2] ([1] Berner & Mattner Systemtechnik GmbH, Germany; [2] TU Wien, Austria)

Multidimensional Log Analysis
Marcin Kubacki and Janusz Sosnowski (Warsaw University of Technology, Poland)

10:30 - 11:00 Coffee

11:00 - 12:30 Deployment and Evolution

Session Chair: Lorenzo Strigni

Combining SAN and P-Graphs for the Analysis and Optimization of Industrial Processes
Ricccardo Bernini [1], Andrea Bondavalli [2], Paolo Lollini [2] and Leonardo Montecchi [2] ([1] Blue Reply s.r.l., Italy; [2] University of Firenze, Italy)

Dwarf: Shortening Downtime of Reboot-based Kernel Updates
Ken Terada and Hiroshi Yamada (TUAT, Japan)

Adaptive Deployment Infrastructure for Android Applications
Junior Cupe Casquina, Jane D. A. Sandim Eleuterio and Cecilia M.F. Rubira (University of Campinas, Brazil)

12:30 - 14:00 Lunch

14:00 - 15:30 Fault Prediction and Tolerance

Session Chair: Karama Kanoun

An RSU Replication Scheme for Dependable Wireless Vehicular Networks
João Almeida, Joaquim Ferreira and Arnaldo Oliveira (Instituto de Telecomunicações, Portugal)

Transitioning Fault Predition Models to a New Environment
Jesper Derehag [1], Elaine Weyuker [2], Thomas Ostrand2 and Daniel Sundmark [2] ([1] Ericsson AB, Sweden; [2] Mälardalen University, Sweden)

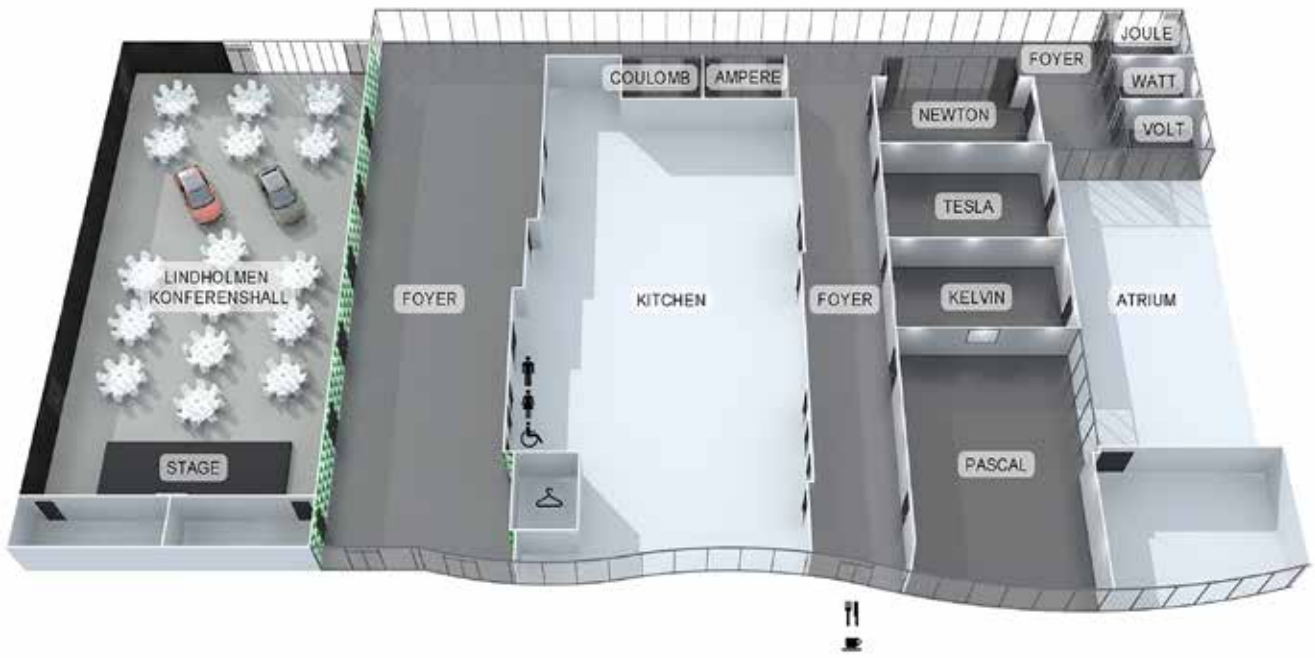
A Performance Comparison of Algorithms for Byzantine Agreement in Distributed Systems
Shreya Agrawal and Khuzaima Daudjee (University of Waterloo, Canada)

Wrap-up 15:30 - 16:00

Practical information

CONFERENCE VENUE

- Lindholmen Conference Centre hosts different tracks of the EDCC conference and is located at Lindholmspiren 5.
- The main track of the EDCC conference will be held in rooms Pascal (Wednesday and Friday) and Lindholmen conference hall (Thursday).
- The Dependable Computing in Practice seminar will be held in the Demo Studio (second floor).
- The SERENE workshop will be held in room Kelvin.
- The CARS workshop will be held in room Pascal.
- Lunches are served in L's Resto, in the same building as the conference rooms.



Practical information

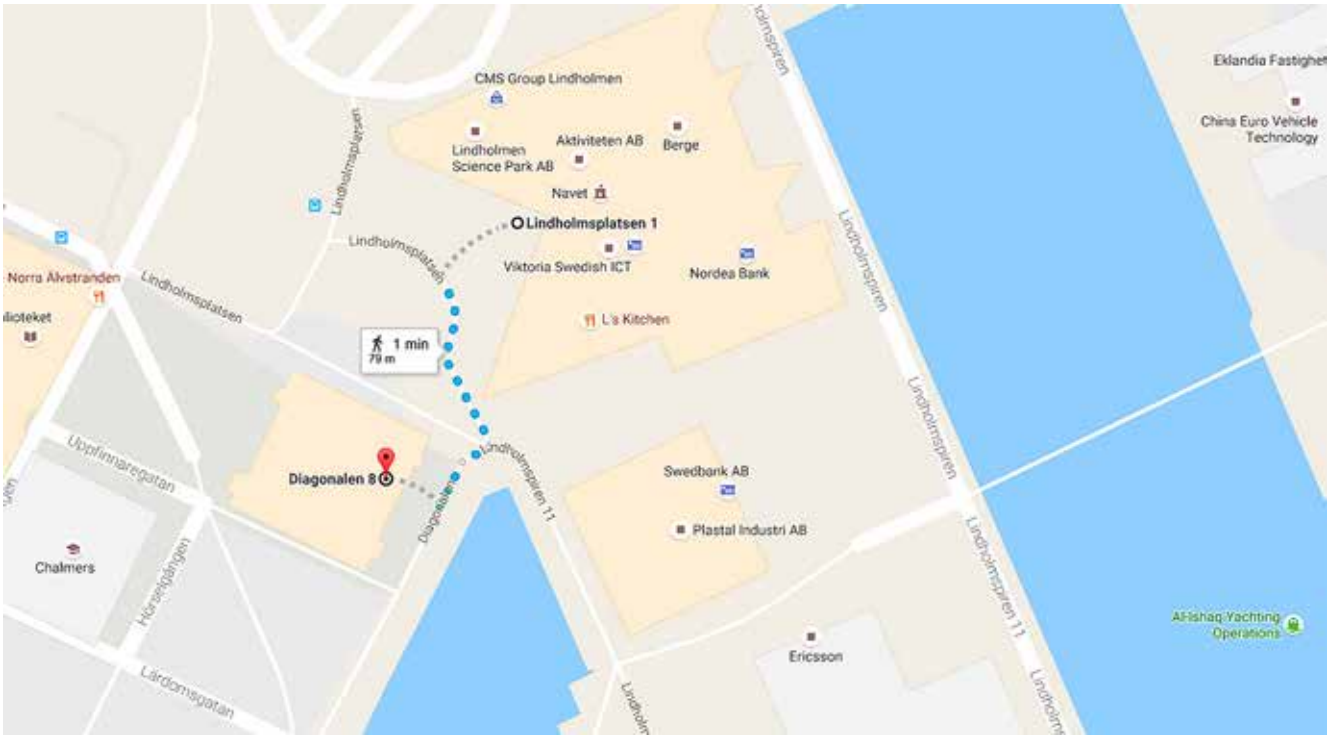
SOCIAL EVENTS

Monday

- Reception for SERENE workshop and Dependable Computing in Practice seminar will be held between 19:00-20:00 at L's Resto, located at Lindholmen Conference Centre.
- Visit to ReVeRe (Chalmers Research Vehicle Resource) lab. ReVeRe is located at Valdemar Noréns gata 12, which is a 9-minute walk from Lindholmen Conference Centre.

Wednesday

- Welcome Reception will be held at Restaurant Bistrot, located in the ground floor of the Jupiter building, a 1 minute walk from the conference centre.



Practical information

SOCIAL EVENTS

Thursday

- Excursion & Banquet at Nya Älvsborgs Fortress, located on a small island in the mouthof the Göta Älv river. A small cruise ship will take the participants to/from the island. The pick up point is 2 minutes walk from Lindholmen Conference Centre.

CONFERENCE PROCEEDINGS

- The conference proceedings are available at: http://conferences.computer.org/edcc/2016 (The site is only live during the conference).
- You can access the proceedings using the following credentials:
  Username: edcc16
  Password: conf16

INTERNET ACCESS

Internet access at Lindholmen Conference Center

- **Network:** CHSRAB-C
- **Password:** ChalmersKonferens

Practical information

PUBLIC TRANSPORTATION

Public transportation in Gothenburg is generally frequent and reliable. Most stops have a screen with realtime arrival times. The transportation is handled by Västtrafik and covers all busses, trams, and ferries within the municipality and beyond.

Pay the fares

http://www.vasttrafik.se/#!/en/tickets-and-prices/

There is an app for iPhone and Android, called Västtrafik ToGo, which you can connect to your bank card and use to pay single fares.

Tickets valid for a certain period of time can be purchased at Västtrafik shops, or any point of sale marked with the Västtrafik logo.

- 24 hours for 85 SEK
- 72 hours for 170 SEK

Boarding/Activating your ticket

If you have a 24- or 72-hour card, all you need to do to activate it is place it in front of the card reader on board. The machine will give a single short beep and the screen will indicate how long the card/trip is valid. You may change vehicles as often as you like within that time-frame (and zone), just place your card in front of the card reader on the next tram/bus as well. If you have a **ToGo**-ticket in your phone, you show it on demand to the driver or ticket inspector.

Styr&Ställ, Rental bike system

- Styr & stall is an easy use bike rental compa- with 50 stations through- the city. One of them is Stenpiren, where you can ac- the ferry to Lindholmen.
- Buy a 3-day pass for only SEK, pay by credit card your pick-up station.

http://en.goteborgbikes.se/Subscription/3-day-Pass/

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INFORMATION AND COMMUNICATION TECHNOLOGY

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