

Lund Circuit Design Workshop

TAKING PLACE IN LUND, SWEDEN, AT GRAND HOTEL
AND FACULTY OF ENGINEERING, LUND UNIVERSITY
SEPTEMBER 5-6 2017

INVITED SPEAKERS

Bob Verbruggen, Xilinx

Marian Verhelst, KU Leuven

Heiner Linke, NanoLund

Michal Stala, ARM

Herbert Zirath, Chalmers

Marianne Larsson, Innovation Skåne



The workshop is hosted by the VINNOVA Industrial Excellence Center in System Design on Silicon (SoS)

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Lund Circuit Design Workshop *will offer an overview of the research activities in IC design at Lund University. Additionally, invited presentations will be given by outstanding experts from academia and industry*



RF Data Converters in 16nm FinFET for Wireless and Wired Infrastructure Applications

BOB VERBRUGGEN, XILINX, DUBLIN, IRELAND

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Network-based, Parallel Computation with Molecular Motors

HEINER LINKE, NANOLUND, LUND UNIVERSITY

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Building an IoT Startup in the Silicon Industry – from Start to Acquisition

MICHAL STALA, ARM, LUND

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Design of Millimeterwave Multifunction Integrated Circuits for Data Communication and Remote Sensing Applications

HERBERT ZIRATH, CHALMERS UNIVERSITY OF TECHNOLOGY, GOTHENBURG

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Intelligent Self-Adaptive Sensing and Computing Towards Always-On Context-Awareness

MARIAN VERHELST, KU LEUVEN, BELGIUM

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Connecting the Dots in Health Technology

MARIANNE LARSSON, DIRECTOR OF INNOVATION, INNOVATION SKÅNE

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PROGRAM

September 5 – Grand Hotel

9.30-10.00 *Registration and Coffee*

10.00-10.30 **Welcome**
OVE EDFORS, EIT, LUND UNIVERSITY

SESSION 1
HIGH-PERFORMANCE
ANALOG ELECTRONICS

10.30-11.15 **Invited Presentation: RF Data Converters in 16nm FinFET for Wireless and Wired Infrastructure Applications**

BOB VERBRUGGEN, XILINX, DUBLIN, IRELAND

11.15-11.30 **A 2.8-3.8GHz Digital PLL with a Class-D DCO in 65 nm CMOS**

AHMED MAHMOUD, EIT, LUND UNIVERSITY

11.30-11.45 **60 GHz VCOs and PLLs in 28 nm FDSOI CMOS**

THERESE FORSBERG, EIT, LUND UNIVERSITY

11.45-12.00 **A 16-20 GHz LO System for 24-30GHz 5G in 28 nm FDSOI CMOS**

STAFFAN EK, ERICSSON RESEARCH

12.00-13.15 *Lunch*

SESSION 2
NANO TECHNOLOGIES

13.15-14.00 **Invited Presentation: Network-based, Parallel Computation with Molecular Motors**

HEINER LINKE, NANOLUND, LUND UNIVERSITY

14.00-14.15 **Nanoscale Materials Integration - a Key to the Versatile Circuits of Tomorrow**

MATTIAS BORG, EIT, LUND UNIVERSITY

14.15-14.45 **Wednesday-poster pitches**

POSTER PRESENTERS, EIT, LUND UNIVERSITY

14.45-15.15 *Coffee*

SESSION 3
MASSIVE MIMO SYSTEMS

15.15-16.00 **Implementing Questions Massive MIMO: Old and New Myths and Questions**

LIESBET VAN DER PERRE, LUND UNIVERSITY/ KU LEUVEN

16.00-16.15 **TDD/FDD Massive MIMO: What does the Data say?**

JOSÉ FLORDELIS, EIT, LUND UNIVERSITY

16.15-16.30 **Reducing On-chip Memory for Massive MIMO Baseband Processing using Channel Compression**

YANGXURUI LIU, EIT, LUND UNIVERSITY

16.30-17.00 **Invited Presentation: Building an IoT Startup in the Silicon Industry from Start to Acquisition**

MICHAL STALA, ARM, LUND

19.00- *Dinner at Skissernas Museum*

PROGRAM

September 6 – Faculty of Engineering, Lund University

SESSION 4 FUTURE TECHNOLOGIES

- 09.00-09.15 *Coffee with Poster Session*
- 09.15-10.00 **Invited Presentation: Design of Millimeterwave Multifunction Integrated Circuits for Data Communication and Remote Sensing Applications**
HERBERTH ZIRATH, CHALMERS UNIVERSITY OF TECHNOLOGY, GOTHENBURG
- 10.00-10.15 **Millimeter-Wave Radar for Material Characterization**
SEBASTIAN HEUNICH, EIT, LUND UNIVERSITY
- 10.15-10.30 **Invited Presentation: Intelligent Self-Adaptive Sensing and Computing Towards Always-On Context-Awareness**
MARIAN VERHELST, KU LEUVEN, BELGIUM
- 11.00-11.30 *Coffee with Poster Session*

SESSION 5 NEW DIRECTIONS

- 11.30-12.15 **Invited Presentation: Connecting the Dots in Health Technology**
MARIANNE LARSSON, DIRECTOR OF INNOVATION, INNOVATION SKÅNE
- 12.15-12.35 **Intelligent Surfaces**
OVE EDFORS, EIT, LUND UNIVERSITY
- 12.35-12.45 **3D-MUSE**
JOACHIM RODRIGUES, EIT, LUND UNIVERSITY
- 13.00-13.15 **Closing Remarks**
SVEN MATTISSON, ERICSSON, CHAIRMAN OF THE SOS BOARD
- 13.00-14.30 *Lunch and continued poster session*

COORDINATORS

PIA BRUHN, Administrative Coordinator at EIT. Pia has worked in different research administrative constellations at LTH and Lund University since 1976 and has supported within all stages from basic research to industrial applications. Pia also administer the international master programs EEE and Wireless Communication.



ANDERS BORGSTRÖM, Research Coordinator at EIT. Anders received the M.S.E.E. degree in 1980 and worked 25 years within mobile phones development in different Ericsson and Sony constellations. A six year interlude at Kockums gave in-depth experience in power electronics and military procurements. In recent years, he co-founded and managed Riidoo AB, developing and delivering ecosystem for e-books.



INVITED SPEAKERS

BOB VERBRUGGEN, XILINX

Bob Verbruggen received the Ms. and Ph.D. degrees in Electrical Engineering at the Vrije Universiteit Brussel in 2005 and 2010 respectively. During his Ph.D. he worked on high-speed calibrated analog-to-digital converters at the Smart Systems and Energy Technology group of imec. From 2010 to 2014 he worked at imec as a researcher working on analog-to-digital converters for software defined radio systems. In 2014 he joined Xilinx, Dublin, to work on high performance data converters. He currently serves on data converters subcommittee of the IEEE International Solid-State Circuits Conference.



HEINER LINKE, NANOLUND

Heiner Linke is a Professor of Nanophysics at Lund University in Sweden. He has a master's degree (Dipl. Phys) in Technical Physics from the Technical University in Munich (1992), and a doctorate degree in engineering physics from Lund University in Sweden (1997). Between 1998 - 2001 he was a research fellow at the University of New South Wales in Sydney/Australia, before joining the physics department at the University of Oregon in 2001 where he received indefinite tenure in 2005 and remained until 2009. Since 2013, he is the Director of the Center for Nanoscience at Lund University (NanoLund), an interdisciplinary research environment engaging about 250 scientists in three faculties. A recipient of an U.S. NSF CAREER Award, his research in experimental physics is concerned with non-equilibrium transport mechanisms, spanning projects in nanoelectronics, fluid mechanics and biological physics. In particular, he is interested in how thermal non-equilibrium can be harvested to produce useful work, for example in thermoelectrics and in molecular motors. He has published more than 150 articles in refereed, international journals (h-index 30, Web of Science), and has given more than 100 invited talks at international conferences, workshops and institutions. He chaired interdisciplinary Nobel Symposia in 2005 and 2012 and is a member of several American and European professional societies. He was elected a member of the Royal Swedish Academy of Sciences (physics class) in 2014.



MICHAL STALA, ARM

Michal finalized his Masters degree in Computer Science in 2004 from Lund University, specializing in System-on-chip. He started his carrier in the field of embedded software design at Sony Ericsson. After a few years, he stated working at Ericsson Research in the field of HW design. His career continued in a product organization at ST-Ericsson as an ASIC designer. In 2012 Michal started as a PhD student at the department of Electrical and Information Technology at Lund University. In June 2015 Michal decided to take a break for his PhD studies and co-founded the company Mistbase with the aim of developing solutions for wireless technologies. Mistbase got acquired by ARM 18 months later. Michal is currently working at ARM as Director and continues to develop wireless solutions for cellular IoT devices and grow the wireless business unit in Lund, Sweden.

**HERBERT ZIRATH, CHALMERS**

Herbert Zirath (M' 86-SM'08-F'11) was born in Göteborg, Sweden, on March 20, 1955. He received the M. Sc and Ph. D. degree in electrical engineering from Chalmers University, Göteborg, Sweden, in 1980 and 1986, respectively. From 1986 to 1996 he was a researcher at the Radio and Space Science at Chalmers University, engaged in developing a GaAs and InP based HEMT technology, including devices, models and circuits. In the spring-summer 1998 he was research fellow at Caltech, Pasadena, USA, engaged in the design of MMIC frequency multipliers and Class E Power amplifiers. He is since 1996 Professor in High Speed Electronics at the Department of Microtechnology and Nanoscience, MC2, at Chalmers University. He became the head of the Microwave Electronics Laboratory 2001. At present he is leading a group of approximately 40 researchers in the area of high frequency semiconductor devices and circuits. His main research interests include MMIC designs for wireless communication and sensor applications based on III-V, III-N, Graphene, and silicon devices. He is author/co-author of more than 560 refereed journal/conference papers, h-index of 40, and holds 5 patents. He is research fellow at Ericsson AB, leading the development of a D-band (110-170 GHz) chipset for high data rate wireless communication. He is a co-founder of Gotmic AB, a company developing highly integrated frontend MMIC chip-sets for 60 GHz and E-band wireless communication.



MARIAN VERHELST, KU LEUVEN

Marian Verhelst is an assistant professor at the MICAS laboratories (MICro-electronics And Sensors) of the EE Department of KU Leuven, Belgium, as of 2012. Her research focuses on self-adaptive circuits and systems, and low-power sensing and processing for the internet-of-things. From 2008 till 2011, she worked in the Radio Integration Research Lab of Intel Labs, Hillsboro OR, doing research on digital assistance of configurable wireless radio front-ends. Marian received a PhD from KU Leuven cum ultima laude in 2008, and was a visiting scholar at the Berkeley Wireless Research Center (BWRC) of UC Berkeley in the summer of 2005.



Marian has a passion for inter-disciplinary collaborations and science communication, is a member of the Young Academy of Belgium, and has published over 60 papers in conferences and journals. She is a member of the ISSCC and DATE TPC, as well as a member of the executive committees of DATE and ISSCC. Marian is an SSCS Distinguished Lecturer, and an associate editor of JSSC.

MARIANNE LARSSON, INNOVATION SKÅNE

Marianne is Director of New Industries and Innovation, project manager of HealthTech Nordic and an appreciated business advisor at Innovation Skåne. Prior to Innovation Skåne Marianne worked for 15 years in international business development at Tetra Pak and Alfa Laval, as well as nine years as an entrepreneur and management consultant in various industries. She is often consulted by national innovation agencies for her expertise and as a juror – for example in the popular Swedish reality show Uppfinnarna (The Inventors) in TV4, The Swedish Mobile Awards and E-health Awards.



INTERNATIONAL ADVISORS

MICHAEL FAULKNER received a B.Sc.(Eng) from London University, UK, and a Ph.D. from the University of Technology, Sydney, Australia. He is Professor in Telecommunications at Victoria University, Melbourne, Australia. He founded and led the Mobile Communications and Signal Processing Research (MCSP) group in 1988 which morphed into Centre for Telecommunications and Micro-Electronics (CTME) in 1992. Prof. Faulkner has successfully obtained and managed numerous industry research contracts and has won journal and conference best paper awards in the areas of amplifier linearization, signal compatibility, and low power receiver filtering. He has been involved in standardization and commercialization activities in the IEEE802.11 (WLAN) space. His research interests include signal processing, circuits, radio wave propagation and all aspects of wireless systems.



QIUTING HUANG received the Ph.D. degree in applied sciences from the Katholieke Universiteit Leuven, Belgium, in 1987. Between 1987 and 1992 he was a lecturer at the University of East Anglia, Norwich, U.K. Since January 1993, he has been with the Integrated Systems Laboratory, Swiss Federal Institute of Technology (ETH), (<http://www.iis.ee.ethz.ch>), Zurich, Switzerland, where he is Professor of Electronics. In 2007 he was also appointed as a part-time Cheung Kong Seminar Professor by the Chinese Ministry of Education and the Cheung Kong Foundation and has been affiliated with the South East University, Nanjing, China. His research interests span RF, analog, mixed analog-digital as well as digital application specific integrated circuits and systems, with an emphasis on wireless communications applications in recent years. He has published widely on those topics in leading solid-state circuits conferences and journals.



JAN RABAEY received his Ph.D degree in applied sciences from the Katholieke Universiteit Leuven, Belgium. He now holds the Donald O. Pederson Distinguished Professorship at the University of California at Berkeley. He is a founding director of the Berkeley Wireless Research Center (BWRC) and the Berkeley Ubiquitous SwarmLab, and has served as the Electrical Engineering Division Chair at Berkeley twice.



Prof. Rabaey has made high-impact contributions to a number of fields, including advanced wireless systems, low power integrated circuits, sensor networks, and ubiquitous computing. His current interests include the conception of the next-generation integrated wireless systems, as well as the exploration of the interaction between the cyber and the biological world.

He is the recipient of major awards, amongst which the IEEE Mac Van Valkenburg Award, the European Design Automation Association (EDAA) Lifetime Achievement award, and the Semiconductor Industry Association (SIA) University Researcher Award. He is an IEEE Fellow, a member of the Royal Flemish Academy of Sciences and Arts of Belgium, and has received honorary doctorates from Lund (Sweden), Antwerp (Belgium) and Tampere (Finland). He has been involved in a broad variety of start-up ventures.

SENIOR RESEARCHERS

PIETRO ANDREANI received the M.S.E.E. degree from the University of Pisa, Italy, in 1988, and the Ph.D. degree from Lund University, Sweden, in 1999. Between 2001 and 2007, he was Chair Professor with the Center for Physical Electronics, Technical University of Denmark, Kgs. Lyngby, Denmark. He was also a part-time IC designer at Ericsson Modems in Lund (2005-2014). Since 2007, he has been an Associate Professor in IC design at EIT. He was a TPC member of the ISSCC (2007-2012) and is a TPC member of ESSCIRC (chair of the Frequency Generation track since 2012, TPC chair in 2014) and RFIC. He has been an Associate Editor of JSSC since 2016, and an IEEE SSCS Distinguished Lecturer since 2017. He was the Director of SoS in 2015-2016.



OVE EDFORS was born in Örnsköldsvik, Sweden in 1966. He received the M.Sc. degree in computer science and electrical engineering in 1990 and the Ph.D. degree in signal processing in 1996, both from Luleå University of Technology, Sweden. In the spring of 1997 he worked as a researcher at the Division of Signal Processing at the same university and in July 1997 he joined the staff at the Department of Electrical and Information Technology, Lund University, Sweden, where he is a professor of Radio Systems. His research interests include radio systems, statistical signal processing and low-complexity algorithms with applications in telecommunication. His main research focus is design and implementation of massive MIMO systems. Since 2017 he is Director of SoS.



ERIK LARSSON received his Ph.D. from Linköping University in 2000. After a post doc at Nara Institute of Science and Technology in Japan (2001-2002), he joined Linköping University as Assistant Professor (2003) and Associate Professor (2006). He did a sabbatical visit at NXP Semiconductors in Eindhoven (2008-2010) and joined Lund University as Associate Professor in 2012. His research interest includes design for test and fault tolerance where he authored/co-authored more than 140 scientific papers. He received the Institution of Engineering and Technology Premium Award (2009) and best paper awards at Asian Test Symposium (2002) and European Test Symposium (2016).



LIANG LIU is an Associate Professor at EIT, Lund University. He received his B.S. and Ph.D. degree in the Department of Electronics Engineering (2005) and Micro-electronics (2010) from Fudan University (Shanghai, China). From Jan. 2010 to April 2010, he was with Rensselaer Polytechnic Institute (New York, USA) as a visiting researcher. He joined Lund University as a Post-doc in 2010 and was Assistant Professor 2014-2015. In 2015, He received Docent. His research interest includes wireless communication system and digital integrated circuits design. Liang is active in several EU and Sweden projects, including FP7 MAMMOET, VINNOVA SoS, SSF HiPEC, and SSF DARE.



JOACHIM NEVES RODRIGUES (S'00-M'05-SM'11) holds currently an Associate Professorship at the Department of Electrical and Information Technology at Lund University, Lund, Sweden. He received his degree in electrical engineering and computer science from the University of Applied Sciences, Kaiserslautern, Germany, and the Ph.D. degree from the Department of Electrosience, Lund University, in 2000 and 2005, respectively. From 2005 to 2008 he acted as ASIC process lead in the digital ASIC department at Ericsson Mobile Platforms (now ST-Ericsson), Lund, Sweden, and he re-joined his current department in 2008. His main research interest is modeling and implementation of digital and mixed-mode microelectronics, architectures for high performance ultra-low power design, which can be operated with an aggressively scaled supply voltage. Focus is on biomedical circuits and systems, and ultra-low voltage memories. He is the chair if the Swedish SSC chapter and the Vice-director for SoS.



FREDRIK RUSEK received the M.Sc. degree in Electrical Engineering in 2003 and the PhD degree in 2007 from Lund University, Sweden. He has been an associate professor and Docent at Lund University since 2012. He is author/co-author of more than 100 papers and patents. His main research interests include modulation theory, equalization, statistical signal processing, and applied information theory.



HENRIK SJÖLAND received the M.Sc. degree in Electrical Engineering in 1994 and the PhD degree in 1997 from Lund University, Sweden. In 1999 he was a postdoc at UCLA on a Fulbright scholarship. He has been an associate professor at Lund University since year 2000, and a full professor since 2008. He is heading the research group in Radio Frequency Integrated Circuit Design at Lund University. Since 2002 he is also part time employed at Ericsson Research. He has authored or co-authored more than 100 international peer reviewed journal and conference papers and holds 18 patents. His research interests include design of radio frequency, microwave, and mm wave integrated circuits, primarily in CMOS technology.



FREDRIK TUFVESSON received his Ph.D. in 2000 from Lund University. After two years at a start-up company, he joined the department of Electrical and Information Technology at Lund University, where he is now professor of radio systems. His main research interests are channel modelling, measurements and characterization for wireless communication, with applications in various areas such as massive MIMO, UWB, mm wave communication, distributed antenna systems, vehicular communication systems and radio based positioning. Fredrik is heading the wireless propagation group, he is PI for the SSF project on distributed antenna systems and is deeply involved in the massive MIMO activities at the department.



SENIOR RESEARCHERS

MARKUS TÖRMÄNEN (S'06–M'10–SM'12) received the PhD degree in Circuit Design in 2010 from Lund University, Sweden. He was an assistant professor at Lund University 2010–2013, and since 2014 he has been associate professor and Docent at Lund University. He has authored/co-authored more than 60 international peer reviewed journal and conference papers. He is assistant program director for Electrical Engineering (M.Sc.Eng) at Lund University and he has been awarded the IEEE Senior Member grade. His research interests include design of analog, RF, microwave, and mm-wave circuits.



LIESBET VAN DER PERRE received the M.Sc. in 1992 and the Ph.D in 1997 from KU Leuven, Belgium, in 1992 and 1997. She was appointed honorary doctor at Lund University, Sweden, in 2015. She is Professor at the department of Electrical Engineering at KU Leuven and guest Professor at the EIT at Lund University. Dr. Van der Perre was with the nano-electronics research institute imec in Belgium from 1997 till 2015. She is a member of the Board of Directors of the company Zenitel since 2015. Prof. L. Van der Perre's main research interests are in wireless communication and embedded system, with a focus on energy efficiency.



JOHAN WERNEHAG received the M.Sc. degree in electrical Engineering and the Ph.D. in circuit design from Lund University, Lund, Sweden, in 2002 and 2008, respectively. In 2009 he joined Nokia where he was working as a Senior RF Design Engineer, integrating and verifying specification and regulatory compliance of wireless chip-set in mobile devices. In 2010 he joined Ericsson Research as a Researcher in the Modem Hardware group in Lund, Sweden. Since 2013 he is an associate professor at Lund University. His research interests are in the area of RF, mm-wave, and mixed-signal circuits for wireless communication. He is the recipient of the 2008 IEEE Asian Pacific Conference on Circuit and System 'Outstanding Student Paper Award'.



VIKTOR ÖWALL is Dean of the Faculty of Engineering, Lund University, and is Professor in Circuit Design specialized in the design of digital architectures. He received the Ph.D. degree from Lund University in 1994 and during 1995 to 1996 he was a postdoc at UCLA. His main research interest is in the field of combining theoretical research with hardware implementation aspects and reconfigurable computing platforms. Main application areas are wireless communication and biomedical applications. He is currently supervising Michal Stala, Steffen Malkowsky, Yangxurui Liu and Mojtava Mahdavi is on his way in. Viktor has supervised 12 PhD students to their successful examination. He is a member of the VLSI Systems and Applications Technical Committee of IEEE CAS and a TPC member of ESSCIRC.



POSTDOCS

MOHAMMED ABDULAZIZ was born on 1983. He received his master degree in system on chip from Lund university. His master thesis was about digital phase locked loops and it was held in the department of electrical and information technology, Lund university. Since September 2011 Mohammed has been a PhD student in the analog RF group in the same department. His current research focus is on mobile RF front end receivers and baseband active channel select filters with the focus on linearization techniques.



MIN KEUN CHUNG received the B.S. and Ph.D degrees from the school of electrical and electronic engineering, Yonsei University, Seoul, South Korea, in 2010 and 2016, respectively. In 2013 and 2015, He was with the National Instruments at Austin, TX, USA, as a Research Intern, where he participated in the design and implementation of signal intelligence and next generation wireless systems. He was a Postdoctoral Research Fellow with the Yonsei Institute of Convergence Technology, South Korea, where he was involved in the design and implementation of the physical layer of full duplex communication systems from 2016 to 2017. He is currently a Postdoctoral Research Fellow with the Wireless Communications Research Group at the Department of Electrical and Information Technology, Lund University, Sweden. His primal research interests are the design and implementation of the mmWave massive MIMO system.



CARL GUSTAFSON was born in Kristinehamn, Sweden in 1983. He received the Ph.D. degree in Radio Systems from the department of Electrical and Information Technology, Lund University, where he now is working as a post-doctoral researcher. His main research interests include channel measurements and modeling for mm-wave and vehicular wireless systems, as well as for cellular systems operating above 6 GHz. Other research interests include massive MIMO, antenna array processing, statistical estimation and electromagnetic wave propagation.



BABAK MOHAMMADI (S'12-M'17) received the M.Sc. degree in electrical engineering from Lund University, Lund, Sweden, in 2012. In 2017 he received his Ph.D. degree in the Electrical and Information Technology Department, Lund University. He was an intern at ST-Ericsson, Lund, Sweden, in 2012 and STMircroelectronics, Crolles, France, in 2014. His current research interests include power optimization, energy harvesting and energy recycling, charge pump design, memories and assist techniques.



DIMITAR NIKOLOV has received his Diploma Engineer degree from the Faculty of Electrical Engineering and Information Technologies, Ss. Cyril and Methodius University in Skopje, Macedonia, 2008. In 2009, he started his PhD studies at Linköping University, where in December 2012 he received the Licentiate Degree. From January 2013 he joined Lund University, Sweden, where in January 2015 he obtained his PhD degree. His research field includes fault tolerance in embedded systems. Other topics of interest include testing of digital systems and high performance computing. Currently, he is a postdoctoral researcher at Lund University, involved in the design of a reconfigurable digital baseband processor for Massive MIMO.



FEDERICO PEPE was born in Italy in 1985. He received the Master and PhD degree in electrical engineering from Politecnico di Milano, Milan, Italy, in 2010 and 2014, respectively. His research activity includes the design of RF oscillators in submicrometer CMOS processes and the mathematical modeling of non-stationary noise sources in time-varying circuits. In September 2014, he joined Lund University as postdoctoral researcher, involved in the design of frequency synthesizers and oscillators for Advanced LTE applications.



HEMANTH PRABHU received his Bachelor's degree in electronics and communication in 2006 from Bangalore, India. He has worked in Texas Instruments for 3 years as digital design engineer. He received his MS in System On Chip and PhD in Electrical Engineering from Lund University in 2011 and 2017, respectively. His doctoral studies focused on algorithms for baseband signal processing for massive MIMO, and hardware implementation using HLS and reconfigurable platforms. Currently he is pursuing his post-doc in EIT, with focus on co-operative distributed processing in collaboration with Intel.



PHD STUDENTS

ERIK BENGTSOON received M. Sc in Electrical Engineering from Lund University 1997. He joined Ericsson Mobile Communication AB in Lund the same year and worked with RF ASIC design until 2005. He then joined Nokia A/S in Copenhagen and worked with antenna concept development with focus on reconfigurable antennas. In 2011 he joined Sony Mobile in Lund and belongs to the Network Technology lab. From 2015 he is an industry PhD student at the Department of Electrical and Information Technology, Lund University, partly founded by Swedish Foundation for Strategic Research (SSF). His current research focus is terminal diversity aspects from a massive MIMO perspective.



JOSE FLODELIS was born in Spain in July, 1977. He received his M.Sc. degree in Telecommunications from Universitat Politècnica de València, Spain, in 2000 and his M.Sc. degree in Electronics with Emphasis in Microwave Technology from Högskolan i Gävle, Sweden, in 2001. He has been with Ericsson since 2002 working in the design and implementation of mobile platform solutions for GSM/WCDMA/LTE. In 2012 he joined the Radio Systems group at the department of Electrical and Information Technology, Lund University, Sweden, where he is currently pursuing his Ph.D. degree. His research interests are estimation and modeling of radio channels and distributed MIMO systems.



THERESE FORSBERG received a M.Sc. in Electrical Design engineering from Linköping University in 2007, with focus on electrical design and organic electronics. During her studies she also worked as a trainee for three months at Omron in Kyoto, where she developed touch sensors. Her Master's thesis was carried out at Sony Ericsson and addressed RF coexistence issues in cellphones when integrating A-GPS receivers. In the summer of 2013, after almost 6 years of working with design and verification of integrated radio circuits at Ericsson/ST-Ericsson in Lund, she started her PhD studies at the department of Electrical and Information Technology at Lund University. Her field of interest is mm-wave analog CMOS circuit design.



RAKESH GANGARAJIAH received his Master's degree in System on Chip design from Lund University in 2010. He has worked for some consultant companies in India doing ASIC verification for a few years. He received his PhD degree from the department of Electrical and Information Technology in March 2017. He is part of the "DARE" team which is working towards implementing a smart receiver for LTE-Advanced technology.



SARA GUNNARSSON was born in Alvesta, Sweden in 1991. She received the M.Sc. degree in Electrical Engineering from Lund University in 2017. Sara is now working towards a Ph.D. degree at the department of Electrical and Information Technology, Lund University. Research interests include channel characterization and modelling in order to improve reliability and efficiency as well as to provide location information in massive MIMO systems.



JONAS LINDSTRAND was born March 24, 1982, in Trelleborg, Sweden. He received a M.Sc. degree in electrical engineering from Lund University, Sweden, in 2010, on the subject of Mixed-Class RF Power Amplifiers for Envelope Tracking Systems in CMOS Technology. His Master Thesis was funded by Ericsson Research, Lund, Sweden and carried out at Bram Nauta's Integrated Circuit Design (ICD) group at the University of Twente, The Netherlands. Jonas is currently pursuing a PhD in Circuit Design at the Department of Electrical and Information Technology (EIT), Lund University, Sweden. The main research area is Radio Frequency Integrated Circuits (RFICs) with a focus on radio transmitters and antenna interfaces.



XIAODONG LIU received his M.Sc. degree in System on Chip from Lund University in 2011. His master thesis focused on the design of on-chip balun and receiver front-end at Ericsson Lund. Currently he is pursuing his PhD degree in the mixed signal group at the Department of Electrical and Information Technology, Lund University. His main research interests include design and optimization of analog to digital data converters for mobile communication system. The research is part of the Digitally-Assisted Radio Evolution (DARE) project.



YANGXURUI LIU was born in Beijing, China, in 1991. He received his bachelor degree and Master's degree in College of Computer Science from National University of Defense Technology, in 2010 and 2012. He is currently a PhD student in Digital ASIC group at EIT, mainly focusing on energy-efficient DSP hardware.



MOJTABA MAHDAVI received his M.Sc. degree in electrical engineering from Sharif University of Technology, Tehran, Iran in 2010. From 2010 to 2012 he was with Advanced Integrated Circuit Design Laboratory (AICD Lab) at Sharif University of Technology. He is currently working toward the Ph.D. degree in Digital ASIC group at Department of Electrical and Information Technology (EIT), Lund University. His research interest includes wireless communication systems, digital circuit design (ASIC/FPGA), and base-band processing for Massive MIMO systems.



AHMED MAHMOUD was born in Fayoum, Egypt, in 1986. He received his BSc in electronics and communication engineering from Fayoum University, Egypt, in 2008. He received his master degree in electronics and communication engineering from Fayoum University, Egypt in 2011. His master thesis was about current mode circuits. Since November 2012, he is a PhD student in the mixed-signal group at the department of Electrical and Information Technology, Lund University. His research focus is on phase locked loops.



STEFFEN MALKOWSKY was born in Mühlacker, Germany, in 1984. He received his B.Eng. degree in Electrical Engineering and Information Technology from Pforzheim University, Germany in 2011 and his M.Sc. degree in Electronic Design from Lund University in 2013. His master thesis was on the subject of Desynchronization of Synchronous Circuits. He is currently a PhD student at the department of Electrical and Information Technology, Lund University. He is participating in the HiPEC project as well as the upcoming EU-project MAMMOET, mainly focusing on reconfigurable hardware for massive MIMO.



JESÚS RODRÍGUEZ was born in Madrid (Spain), in 1981. He received his Master's Degree in Telecommunication Engineering from University of Málaga, Spain, in 2007. His master thesis was on the subject of "Wavelets video compression for mobile communications". Afterwards he pursued a Postgraduate Master in Communication Technologies in the same University, finishing in 2009 with the thesis project: "Mobile channels estimation for LTE".



He has worked for more than 10 years in the industry as a Physical Layer engineer and RTL Designer focused on diverse communication standards. His research interests are communication systems, digital circuit design, and efficient implementation of DSP algorithms. Jesús is currently a Ph. D. student in the department of Electrical and Information Technology (EIT) at Lund University, Sweden.

MURIS SARAJLIC received the B.Eng. degree in Electrical Engineering from University of Tuzla, Bosnia and Herzegovina in 2010 and the M.Sc. degree in Wireless Communications from Lund University in 2013. He is currently working towards a PhD degree at the Department of Electrical and Information Technology, Lund University. His research interests include energy efficiency and complexity aspects of hardware-constrained wireless communication systems.



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MEMBERS OF THE SOS BOARD

SVEN MATTISSON, chairman, received his PhD in Applied Micro Electronics from Lund University in 1986. From 1987 through 1994 he was an associate professor in Applied Micro Electronics in Lund where his research was focused on circuit simulation and analog ASIC design. 1995 he joined Ericsson in Lund to work on cellular hand-set development. Presently he is with Ericsson in Lund, where he holds a position as senior expert in analog system design. Since 1996 he is also an adjunct professor at Lund University. Dr. Mattisson is one of the principal developers of the Bluetooth concept.



ANDREIA CATHELIN started her electronic studies at the Polytechnic Institute of Bucarest, Romania and graduated from the Institut Supérieur d'Electronique du Nord (ISEN), Lille, France in 1994. In 1998 and 2013 respectively, she received PhD and "habilitation à diriger des recherches" (French highest academic degree) from the Université de Lille 1, France. Since 1998, she has been with STMicroelectronics, Crolles, France, now in Digital Front-End Manufacturing & Technology, Technology & Design Platforms, as Fellow. Her major fields of interest are in the area of RF/mmW/THz systems for communications and imaging. Andreia is serving in several IEEE conferences and committees, such as ISSCC and ESSCIRC, and is member of IEEE SSCS Adcom.



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PETER KARLSSON, Head of Network Technology Lab, Research & Incubation, Sony Mobile. He received his Ph.D. in applied Electronics at Lund Institute of Technology in 1995 and then joined Telia Research. In 2000 Peter was a research fellow at the University of Bristol. In 2001 he headed Mobile System Innovation followed by expert position in radio communications at TeliaSonera 2002. Peter joined Sony Ericsson in 2007 as technology strategy manager and is now leading the network technology research in Sony Mobile. He has written and co-authored more than 70 conference and journal papers in the mobile and wireless communications area.



ANTON KLOTZ, studied Technical Computer Science at Mannheim University in Germany and joined Cadence Design Systems in 2004 as Application Engineer, where he was responsible for physical verification and DFM for large digital designs. In 2015 he became University Program Manager for the EMEA region.”



PETER OLANDERS took his PhD in Mathematical Physics in Lund 1984, started with radar design at Ericsson in 1985, moved to Televerket Radio/Telia Research in 1988 and then mobile systems at Ericsson in 1996. He has held various management positions at Telia and Ericsson, now being Research Leader. Many positions in standardization, industrial collaboration as well as university collaborations. Chaired Competence Centre for Circuit Design (CCCD) at Lund University board 1999 – 2007, currently chairing GHz competence centre at Chalmers (since 2007) as well as recently joined the SOS Board.



KARL-ERIK ÅRZÉN received his PhD in Automatic Control from Lund University in 1987. Since 2000 he is Professor in Automatic Control at Lund University. Since 2015 he is co-director for the Wallenberg Autonomous Systems and Software Program (WASP). He is also a member of the board for the ELLIIT strategic research area on IT and mobile communication, member of the research board of the Faculty of Engineering (LTH) at Lund University, and chair of IVA Syd. His research interests are control of computer systems, cloud computing, cyber-physical systems, and embedded and real-time control. He has written and co-authored more than 180 conference and journal papers.”

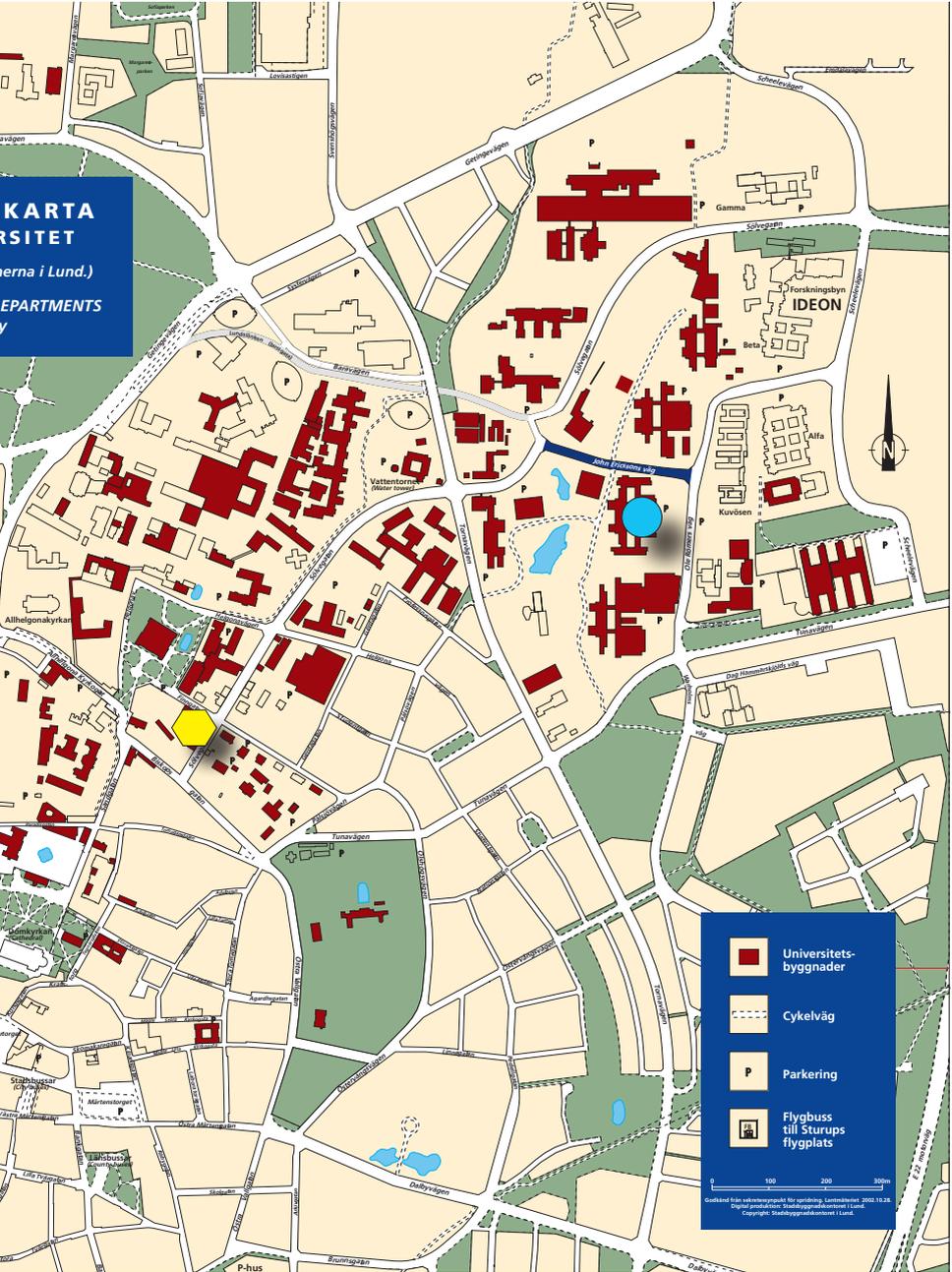


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