Center for Wireless Technology Eindhoven (CWTe)

CWTe 2024 Research Retreat

October 17, 2024

Abstracts of the talks and the speaker's bios.

Drowning in data: setting sustainable goals in navigating the scientific data deluge of today and the future
- Jessica Dempsey (ASTRON)

Abstract:

The coming decade will see a renaissance in radio astronomy across the world, with capabilities of exploring the invisible universe supported by ground-breaking billion euro facilities. With these new windows on the universe, come formidable data rates and unprecedented compute and storage needs. Radio astronomy is about to be the first, but not only, science now limited by the costs and carbon of compute and storage. I will discuss the way to map the true data footprint of a research infrastructure, and how to treat sustainability and green science as a desirable requirement and achievable goal rather than a limitation to our ambitions.

Speaker's bio:

Professor Dr Jessica Dempsey serves as ASTRON Director and Radboud University's Ethics in Astronomy Professor. With a background in instrumentation science and radio surveys, she held key roles including Deputy Director at the East Asian Observatory and pioneering Australian female scientist at the South Pole Station. Committed to diversity, she advocates for gender equality in STEM leadership, empowering young girls to pursue roles in science and technology and real solutions to sustainable futures for research infrastructures.

Satellite Communications: Navigating Industry Disruption - Warren Gebbettt (SES)

Abstract:

The first commercial communication satellite was launched 62 years ago. Video broadcast made satellite communications an immensely successful industry. However, with the arrival of video-on-demand alternatives, the focus has shifted from traditional broadcasting to two-way data communications. Over the past decade, satellite communications have experienced more technological and business innovation than in its entire history. Navigating this disruption is crucial. This presentation will provide a concise history of commercial satellite communications, examine the current state of the industry, and explore future possibilities.

Speaker's bio:

Warren Gebbett is a Senior Manager Constellations Modelling at SES, a global content and connectivity provider with satellites operating in both Medium Earth Orbit (MEO) as well as Geostationary Orbit (GEO). In his current role, Warren is responsible for evaluating the performance and efficiency of satellite communication constellations, playing a crucial role in shaping the next-generation fleet. Throughout his career at SES and O3b, he has held various positions in Systems Engineering and Fleet Development. Warren holds a Master's degree in Aerospace Engineering from Delft University of Technology and completed his thesis at NASA's Jet Propulsion Laboratory.

Future chips: now what?
- Peter Baltus (TU/e)

Abstract:

Chips are everywhere! They have successfully replaced alternative technologies in an incredibly large range of applications due to their size, cost, power, and environmental advantages over other solutions. Now, semiconductors is at a transition point where the decades-long successful dimensional scaling is no longer providing the "one-size-fits-all" technology benefits to the large diversity of functions that are implemented in electronics equipment. At the same time, chips have (finally) been recognized as a strategic technology outside of the electronics community due to geopolitical developments and supply chain issues in recent years. This offers multiple scenarios for the future development of chips with related opportunities as well as risks. This presentation will discuss the research activities for exploring and addressing these scenarios in the integrated circuits group of the TU/e.

Speaker's bio:

Peter Baltus was born on July 5th 1960 in Sittard, The Netherlands. He received his master's degree in Electrical Engineering from Eindhoven University of Technology in 1985, and his PhD degree from the same university in 2004. He worked for 22 years at Philips and later NXP in Eindhoven, Nijmegen, Tokyo and Sunnyvale in various functions, including research scientist, program manager, architect, domain manager, group leader and fellow in the areas of data converters, microcontroller architecture, digital design, software, and RF circuits and systems. In 2007 he started his current job at the Eindhoven University of Technology as professor in high-frequency electronics. From 2007 through 2016 he was director of the Centre for Wireless Technology and as of 2017 he is chair of the integrated circuits group. He co-authored more than 200 papers and holds more than 20 patents.

Integrated Sensing and Communication for 6G: Architectural and Management perspectives
- Haibin Zhang (TNO)

Abstract:

Integrated Sensing and Communication (ISAC), also referred to as Joint Communication and Sensing (JCAS), integrates communication and sensing in a single system and is globally seen as a technology candidate for 6G with promising resource and cost efficiency. Depending on the level of integration, different radio resources may be shared by the two features in different manners, posing various challenges in achieving a desired trade-off between communication and sensing performance. This presentation aims to identify the potentials of ISAC, addresses the challenges associated with different levels of integration, and propose (potential) solutions and research directions from architectural and management perspectives.

Speaker's bio:
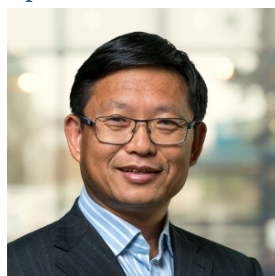
Prof. dr. Haibin Zhang is senior scientist and strategist at TNO. He is responsible for research, technical and strategic consultancy in TNO activities related to 5G/6G and upcoming wireless communication technology, 5G/6G for vertical applications, and sustainable ICT networks. He has been active in the acquisition of European and customer-funded R&D projects, and is active in the international/European research community e.g. COST Actions, IEEE. He is visiting professor at National Taiwan University (NTU), and IET fellow.

AI for Wireless: lessons from AI for Science
- Arash Behboodi (Qualcomm)

Abstract:

A plethora of methods that we brand AI have been used during recent years to contribute to various scientific research with notable examples in drug and material discovery and weather forecasting. We revisit the story of these research activities, call it AI for science, to shed light on how AI can impact wireless research. We give examples of some problems in wireless communication and discuss how machine learning approaches for differentiable simulations, black box optimization and inverse problems can be used to solve them.

Speaker's bio:

Arash Behboodi received the B.Sc. and M.Sc. degrees in electrical engineering from the Sharif University of Technology, Tehran, Iran, in 2005 and 2007, respectively and the Ph.D. degree from Ecole Suprieure d'electricit (now CentraleSuplec), Gif-sur-Yvette, France, in 2012. He received master's degree in philosophy from Pantheon-Sorbonne university, 2011. Currently, he is a Director of Engineering at Qualcomm AI Research. He has been doing research on information theory, machine learning theory, neural network efficiency, compressed sensing and inverse problems. He has been a recipient of multiple best paper awards including Asilomar conference, and organized multiple workshops on machine learning and other related topics including the most recent one on resource constrained learning at MLSys 2023 and a workshop on differentiable simulation at NeurIPS 2024.

Speaker tbd

Poster pitches

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