



The 14th European Radar Conference

**Duration: 08:30 - 17:50**

**Room: Neu Delhi**

**WTh-02**

### **Short Range mm-Wave Imaging Systems**

**Organisers:**

Sherif S. Ahmed, Rohde & Schwarz, Germany

Lorenz-Peter Schmidt, University Erlangen-Nurnberg, Germany

**Abstract**

Millimetre-wave (mmW) imaging is extending its footprint rapidly to serve new applications. Solutions for security screening as well as industrial demands are evolving in the market space. A huge burden caused by the needed integration complexity is vanishing nowadays thanks to the cost reduction by various semiconductor miniaturisations, e.g., SiGe and CMOS, as well as the ever-increasing computation capacities of digital units, e.g., GPUs and FPGAs.

Short-range imaging is specifically interesting for high-resolution demanding applications. Security screening for instance is among them, where a few millimetre of resolution is essential for threat detection. In addition, object illumination is optimal at short ranges. In achieving this, image formation is very challenging due to the antennas wide looking angles involved. Many advanced image formation algorithms adapted for short range imagery are also evolving from academia. Consequently, vast realisation possibilities for short-range mmW imaging systems are becoming available.

In this workshop, talks from industry as well as research institutes are presented to highlight the state-of-the-art in this domain, and to offer an attractive overview for newcomers into mmW imaging technologies.

***Programme***

***08:30 - 08:40 Workshop Introduction***

Chairs

***08:40 - 09:25 Fully Polarimetric Short-Range Imaging Radar***

Julian Adametz, University Erlangen-Nurnberg, Germany

***09:25 - 10:10 Computational Frequency-Diverse Microwave Imaging Using Coded Metasurface Apertures***

Okan Yurduseven, Duke University, USA

***10:10 - 10:50 Break***

***10:50 - 11:30 Microwave Imaging Using Rotating Linear Antenna Arrays***

Jianping Wang, Pascal Aubry, Alexander Yarovoy, Delft University of Technology, The Netherlands

***11:30 - 12:10 High Resolution Automotive Radar - From a Simple Dipstick to a 4D Image-Like Scene Representation***

Martin Kunert, Robert Bosch GmbH, Germany

***12:10 - 12:30 Discussion on Synergies Between Security and Automotive mm-Wave Imaging***

***12:30 - 13:50 Break***

***13:50 - 14:30 Calibration Concepts for Multistatic Short Range Imaging Radar***

Frank Gumbmann, Rohde & Schwarz, Germany

***14:30 - 15:10 Millimeter-Wave Radar Image Reconstruction in Heterogeneous Media***

I. Ullmann, University Erlangen-Nuremberg, Germany

***15:10 - 15:30 Progress in the Preparation of the ANSI 42.59 Standard for Measuring the Imaging Performance of Active Millimeter-Wave Systems for Security Screening of Humans***

Sherif Ahmed, Rohde & Schwarz, Germany

***15:30 - 16:10 Break***

***16:10 - 16:40 Fully Electronic Microwave Imaging - Systems and Modules***

Andreas Schiessl, Rohde & Schwarz, Germany



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***16:40 - 17:10 Advanced SiGe Circuits for High Resolution mm-Wave Radar Measurements and Imaging***

Nils Pohl, Fraunhofer FHR, Germany

***17:10 - 17:40 Next-Generation Silicon-Based mm-Wave Imaging: From Promise to Product?***

Wim Van Thillo, IMEC, Belgium

***17:40 - 17:50 Discussion on New Trends and Applications for mm-Wave Imaging Technologies***