

Duration: 08:30 - 17:50

Room: Seoul

WF-06

Sub-Millimetre Wave and THz imaging for Security

Organisers:

Roger Appleby, InnovaSec, UK

Sherif Ahmed, Rohde & Schwarz, Germany

Abstract

This workshop will showcase the imaging technology and systems being developed in Europe for next generation submillimetre wave safety and security systems. Security screening at airports using millimetre wave technology is now common place and is being adopted in adjacent markets such as loss prevention, crowd screening and mass transport. However improved performance is still needed to meet evolving threats and at the same time greater freedom is demanded by society during screening.

Systems using state of the art passive, active and combined active and passive submillimetre wave systems have been researched and developed to meet these new requirements and will be presented in this workshop. This includes passive systems with large cooled focal planes (~9000 elements), high frequency MMICS and multipliers and a novel 340 GHz homodyne transceiver.

There are currently three projects coming to fruition which have benefited from European funding TERASCREEN (FP7), CONSORTIS (FP7) and TIPSSI (EDA) and they will all present at the workshop along with work from other internationally recognised experts in similar fields.

Programme

08:30 - 08:45 Introduction and Welcome

R. Appleby, InnovaSec, UK

S. Ahmed, Rohde & Schwarz, Germany

08:45 - 09:10 Passive Submillimetre-Wave Video Camera for Security Screening

E. Heinz, D. Born, G. Zieger, S. Anders, K. Peiselt, T. Krause, A. Krüger, M. Schulz, H.-G. Meyer, Supracon AG, Germany, Leibniz Institute of Photonic Technology e.V., Germany

09:10 - 09:35 Kinetic Inductance Bolometer Technology for Passive Sub-Millimetre Wave Imaging

J. Hassel, H. Sipola, A. Timofeev, L. Grönberg, A. Mäyrä, J. Luomahaara, M. Aikio, K. Tappura, A. Rautiainen, M. Leivo, A. Tamminen, A. Luukanen, VTT, Asqella, Finland

09:35 - 10:00 Real Time Video Rate Passive THz Imaging using Aluminium LeKID Detectors

K. Wood, QMC Instruments, UK

10:00 - 10:10 Discussion

10:10 - 10:50 Break

10:50 - 11:12 Design of Wide Field-of-View Quasi-Optical Systems for Concealed Object Detection Imagers at Submillimetre Wavelengths

N. Llombart, E. Gandini, TU Delft, The Netherlands

11:12 - 11:34 70 nm and 40 nm MHEMT MMIC Processes for mm-Wave and THz Applications

M. Renvoisé, R. Cleriti, P. Frijlink, R. Doerner, V. Krozer, E. Limiti, OMMIC, France, Università degli Studi di Roma, Italy, Leibniz Institute of Photonic Technology e.V., Germany, University of Frankfurt/Main, Germany

11:34 - 11:56 90 GHz to 360 GHz Components for TeraSCREEN

H. Wang, T. Al-Sawaf, N. Brewster, C. Viegas, M. Oldfeld, B. Alderman, M. Hrobak, N. Weimann, V. Krozer, STFC-RAL(UK), Leibniz Institute of Photonic Technology e.V. Germany, University of Frankfurt/Main, Germany, Teratech Components, UK

11:56 - 12:18 Automatic Anomaly Detection in Sub-mm Wave MultiMode Body Scanner Systems

H. Petersson, M. Axelsson, J. Rydell, V. Deleskog, F. Bissmarck, Swedish Defence Research Agency, Sweden

12:18 - 12:30 Discussion

12:30 - 13:50 Break

13:50 - 14:20 Simulation of an Active 220 GHz Standoff Imager Prototype

J. Svedin and T. Bryllert, FOI and WASA, Sweden

14:20 - 14:50 The CONSORTIS Multi-Channel 340 GHz Security Screening Radar

D. A. Robertson, D. G. Macfarlane, R. Hunter, S. L. Cassidy, N. Lombart, E. Gandini, T. Bryllert, M. Ferndahl, H. Lindström, J. Tenhunen, H. Vasama, J. Huopana, T. Selkälä, A.-J. Vuotikka, University of St Andrews, UK, TU Delft, The Netherlands, Wasa, Gotmic, Sweden, VTT, Finland

14:50 - 15:20 Terahertz Radar Developments at UPM

G. R. Cidre, J. G. I de la Fuente, F. G. Rial, M. R. Torres, Technical University of Madrid, Spain

15:20 - 15:30 Discussion

15:30 - 16:10 Break

16:10 - 16:35 Developing and Testing a Dual Mode Passive/Active Imaging System

C. Mann, N. Bowring Digital Barriers, Manchester Metropolitan University, UK

16:35 - 17:00 Active and Passive Imaging Systems for Security Screening in the Millimetre-wave and Terahertz Range

R. Herschel, J. C. Iriarte, I. Maestrojuán, D. Platt, Fraunhofer Institute, Germany, Universidad Pública de Navarra, Spain, Acero, Sweden

17:00 - 17:25 CONSORTIS System Modeling and Performance

R. Appleby, S. Ferguson, H. Petersson, InnovaSec, Queen's University Belfast, UK, FOI, Sweden

17:25 - 17:40 Close