Video-Rate Passive TeraHertz Imaging for Stand-off Security Imaging

GUEST SPEAKER

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When: **5th May 2010, 10.00 a.m. to 11.00 a.m.**
Where: **Institute of Microelectronics, Singapore**
11 Science Park Road Singapore Science Park II Singapore 117685

Abstract
At present, the imaging of concealed weapons and contraband is primarily carried out at mm wavelengths at a relatively short stand-off range of a few metres mainly because of spatial resolution considerations. In order to maintain a reasonable aperture size, there is a desire to extend the operating frequency towards 1 THz. In this paper we report the progress on a video-rate THz camera demonstrator which utilises broadband antenna-coupled microbolometres as detectors, operated within a turn-key commercial closed-cycle cryocooler. A full system has been integrated consisting of 64 parallel sensors and readout electronics, and reflective Schmidt camera optics incorporating a conical scanner for real time imaging. At present, the system provides near real time submillimetre-wave video imagery at 6 frames per second with a 0.5 K radiometric resolution.

Speaker Biography

Prof Arttu Luukanen (born 1972, native of Finland) received his M.Sc. degree from the University of Helsinki, Finland in applied physics in 1999. He was awarded a Ph.D. in 2003 from the University of Jyväskylä, Finland, also in applied physics. After this he joined the VTT Technical Research Centre of Finland as a research scientist. From late 2003 until 2005 he worked as a guest researcher at the National Institute of Standards and Technology in Boulder, Colorado, U.S.A. During this time his research focused on the development of both active and passive THz imaging systems for security applications. In 2005, he was appointed as the director of MilliLab - the Millimetre-wave Laboratory of Finland. From 2007 onwards, Dr Luukanen has served on the International Advisory Board of FOI-FOCUS Centre of Excellence on Sensors, Multisensors and Sensor networks. He is also a member of the Finnish Academy of Technical Sciences.

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