

# SSPD2016 Thursday 22<sup>nd</sup> September

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**8:30 Registration and Refreshments**

**9:00 Welcome and opening**

Mike Davies, University of Edinburgh

**9:10 Plenary Keynote: Sparse Sensing for Statistical Inference**

Geert Leus, Delft University of Technology

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## Session 1: Tracking and Detection

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**10:10 1.0 Invited Speaker: Multi-sensor multi-target tracking techniques for Space Situational Awareness**

Daniel Clark, Heriot-Watt University

**10:40 1.1 An Adaptive Receiver Search Strategy for Electronic Support**

Sabine Apfeld<sup>1</sup>, Alexander Charlish<sup>1</sup>, Wolfgang Koch<sup>2</sup>, <sup>1</sup>Fraunhofer, <sup>2</sup>Fraunhofer/University of Bonn

**11:05 Refreshments**

**11:30 1.2 New environmental dependent modeling with Gaussian particle filtering based implementation for ground vehicle tracking**

Miao Yu<sup>1</sup>, Yali Xue<sup>1</sup>, Runxiao Ding<sup>1</sup>, Hyondong Oh<sup>1</sup>, Wen-Hua Chen<sup>1</sup>, Jonathon Chambers<sup>2</sup>, Loughborough University<sup>1</sup>, Newcastle University<sup>2</sup>

**11:55 1.3 Robust Detection of micro-UAS drones with L-band 3-D Holographic Radar**

<sup>1</sup>Mohammed Jahangir, <sup>1</sup>Chris Baker, Aveillant Ltd<sup>1</sup>

**12:20 1.4 Direction Finding Antenna Arrays with Improved Accuracy and Reduced Complexity and Size**

<sup>1</sup>Houcem Gazzah, University of Sharjah<sup>1</sup>

**12:45 Lunch**

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## Session 2: Signal Processing Challenges – Industrial Perspective – Chair, Paul Thomas, Dstl

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**13:40 Industrial Speakers and Panel Discussion**

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## Session 3: Poster Session

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**14:40 Posters and Refreshments available**

**16:10 4.0 Invited Speaker: Transmit Adaptivity in Radar**

Antonio De Maio, University of Naples Federico II

**16:40 4.1 Experimental Study on Full-Polarization Micro-Doppler of Space Precession Target in Microwave Anechoic Chamber**

Jin Liu<sup>1</sup>, Qihua Wu, Xiaofeng Ai<sup>1</sup>, Feng Zhao<sup>1</sup>, Jian'an Chen<sup>1</sup>, <sup>1</sup>National University of Defense Technology

**17:05 4.2 Fractional Fourier Transform Based Co-Radar Waveform: Experimental Validation**

Domenico Gaglione<sup>1</sup>, Carmine Clemente<sup>1</sup>, Adriano Rosario Persico<sup>1</sup>, Christos V. Ilioudis<sup>1</sup>, Ian Proudler<sup>2</sup>, John J Soraghan<sup>1</sup>, <sup>1</sup>University of Strathclyde, <sup>2</sup>Loughborough University

**17:30 Close and End of Day 1**

**19:30 Wine Reception and Meal (Prince Philip Building, Royal College of Surgeons)**

# SSPD2016 Friday 23<sup>rd</sup> September

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**8:45 Registration and Refreshments**

**9:15 Welcome to day 2**

Jonathon Chambers, Newcastle University

**9:25 Plenary Keynote: Taming the Torrent: Future Military Signal Processing and Information Fusion**

Philip Perconti, US Army Research Laboratory

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## Session 4 cont.: Radar and Lidar

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**10:25 4.3 Discriminating Underwater LiDAR Target Signatures using Sparse Multi-spectral Depth Codes**

Puneet S Chhabra<sup>1</sup>, Aurora Maccarone<sup>1</sup>, Aongus McCarthy<sup>1</sup>, Andrew M Wallace<sup>1</sup>, Gerald Buller<sup>1</sup>,  
<sup>1</sup>Heriot-Watt University

**10:50 4.4 Efficient Range Estimation and Material Quantification from Multispectral Lidar Waveforms**

Yoann Altmann<sup>1</sup>, Aurora Maccarone<sup>1</sup>, Abderrahim Halimi<sup>1</sup>, Aongus McCarthy<sup>1</sup>, Gerald Buller<sup>1</sup>, Steve McLaughlin<sup>1</sup>, <sup>1</sup>Heriot-Watt University

**11:15 Refreshments**

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## Session 5: Signal Processing Challenges – Military User Perspective - Chair, Paul Thomas, Dstl

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**11:45 MOD Speakers and Panel Discussion**

**12:45 Lunch**

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## Session 6: Synthetic Aperture Imaging

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**14:00 6.1 GMTI in circular SAR data using STAP**

Emiliano Casalini<sup>1</sup>, Daniel Henke<sup>1</sup>, Erich H. Meier<sup>1</sup>, <sup>1</sup>University of Zurich

**14:25 6.2 Digital Elevation Model Aided SAR-based GMTI Processing in Urban Environments**

Di Wu<sup>1</sup>, Mehrdad Yaghoobi<sup>1</sup>, Mike Davies<sup>1</sup>, <sup>1</sup>University of Edinburgh

**14:50 Refreshments**

**15:10 6.3 A Multi-Family GLRT for Detection in Polarimetric SAR Images**

Luca Pallotta<sup>1</sup>, Carmine Clemente<sup>2</sup>, Antonio De Maio<sup>1</sup>, Danilo Orlando<sup>3</sup>, <sup>1</sup>University of Naples Federico II, <sup>2</sup>Strathclyde University, <sup>3</sup>Niccolò Cusano University

**15:35 6.4 A Novel Motion Compensation Approach for SAS**

Salvatore Caporale<sup>1</sup>, Yvan Petillot<sup>1</sup>, <sup>1</sup>Heriot-Watt University

**16:00 Close**

# Poster Session – Thursday 22<sup>nd</sup> September

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*NB. All the posters will be on display in the afternoon session (session 3) of day 1 of the Conference.*

**P01 Spectral Library Clustering Using a Bayesian Information Criterion**

Jonathan Piper<sup>1</sup>, John Duseelis<sup>2</sup>, <sup>1</sup>Dstl, <sup>2</sup>AFRL

**P02 Detection of manoeuvring low SNR objects in receiver arrays**

Kimin Kim<sup>1</sup>, Murat Uney<sup>1</sup>, Bernard Mulgrew<sup>1</sup>, <sup>1</sup>University of Edinburgh

**P03 A Modified Spectral Line Camera for Low Cost Anomaly Detection**

Oscar Somsen<sup>1</sup>, <sup>1</sup>Netherlands Defense Agency

**P04 Bistatic Micro-Doppler Characteristics of Preprocessing Targets**

Xiaofeng Ai<sup>1</sup>, Jin Liu, Feng Zhao<sup>1</sup>, Jianhua Yang<sup>1</sup>, Jian'an Chen<sup>1</sup>, <sup>1</sup>National University of Defense Technology

**P05 High Dynamic Range Spectral Estimation for Incomplete Time Series**

Mike Newman<sup>1</sup>, David Harvey<sup>1</sup>, <sup>1</sup>Thales UK

**P06 Tracking small UAVs using a Bernoulli filter**

David Cormack<sup>1</sup>, Daniel Clark<sup>2</sup>, <sup>1</sup>Heriot-Watt University/Selex ES, <sup>2</sup>Heriot-Watt University

**P07 Robust Unmixing Algorithms for Hyperspectral Imagery**

Abderrahim Halimi<sup>1</sup>, Yoann Altmann<sup>1</sup>, Gerald Buller<sup>1</sup>, Steve McLaughlin<sup>1</sup>, William Oxford<sup>2</sup>, Damien Clarke<sup>2</sup>, Jonathan Piper<sup>2</sup>, <sup>1</sup>Heriot-Watt University, <sup>2</sup>Dstl

**P08 Radar Filters Design in the Presence of Target Doppler Frequency and Interference Covariance Matrix Uncertainties**

Augusto Aubry<sup>1</sup>, Antonio De Maio<sup>2</sup>, Yongwei Huang<sup>3</sup>, Marco Piezzo<sup>4</sup>, <sup>1</sup>Universita degli studi di Napoli, <sup>2</sup>University of Naples Federico II, <sup>3</sup>The Hong Kong University of Science and Technology, <sup>4</sup>Elettronica S.p.A.

**P09 Experimental Analysis of Time Deviation on a Passive Localization System**

Hugo Seute<sup>1</sup>, Ali Khenchaf<sup>2</sup>, Jean-Christophe Cexus<sup>2</sup>, Jean-François Grandin<sup>3</sup>, Cyrille Enderli<sup>3</sup>, <sup>1</sup>Thales Airborne Systems/ENSTA Bretagne, <sup>2</sup>ENSTA Bretagne, <sup>3</sup>Thales Airborne Systems

**P10 Beampattern and polarisation synthesis of 3D RF-seeker antenna arrays**

Luc Fourtinon<sup>1</sup>, Alessio Balleri<sup>2</sup>, Yves Quéré<sup>3</sup>, Christian Person<sup>4</sup>, Annaig Martin-Guennou<sup>3</sup>, Eric Rius, Guillaume Lesueur<sup>5</sup>, Thomas Merlet<sup>5</sup>, <sup>1</sup>Cranfield University/Telecom-Bretagne, <sup>2</sup>Cranfield University, <sup>3</sup>Université de Brest, <sup>4</sup>Lab-STICC/MOM UMR CNRS, <sup>5</sup>Thales Air Systems

**P11 Adaptive M-estimation for Robust Cubature Kalman Filtering**

Changliang Zhang<sup>1</sup>, Ruirui Zhi<sup>1</sup>, Tiancheng Li<sup>2</sup>, Juan Corchado<sup>2</sup>, <sup>1</sup>Northwestern Polytechnical University, <sup>2</sup>University of Salamanca

**P12 Fractional Fourier Based Sparse channel estimation for multicarrier underwater acoustic communication system**

Yixin Chen<sup>1</sup>, John J Soraghan<sup>1</sup>, Carmine Clemente<sup>1</sup>, Stephan Weiss<sup>1</sup>, <sup>1</sup>University of Strathclyde

**P13 Multiple Spherical Arrays Design for Acoustic Source localization**

Xi Pan<sup>1</sup>, Huayang Wang<sup>1</sup>, Fangzhou Wang<sup>1</sup>, Chengtian Song<sup>1</sup>, <sup>1</sup>Beijing Institute of Technology

**P14 Likelihood modelling of the Space Geodesy Facility laser ranging sensor for Bayesian filtering**

Christy Simpson<sup>1</sup>, Andrew Hunter<sup>1</sup>, Sergei Vorgul<sup>1</sup>, Emmanuel D. Delande<sup>1</sup>, Jose Franco<sup>1</sup>, Daniel Clark<sup>1</sup>, <sup>1</sup>Heriot-Watt University

**P15 Cramer-Rao Bounds for Distributed System Size Estimation Using Consensus Algorithms**

Sai Zhang<sup>1</sup>, Cihan Tepedelenlioglu<sup>1</sup>, Jongmin Lee<sup>1</sup>, Henry Braun<sup>1</sup>, Andreas Spanias<sup>1</sup>, <sup>1</sup>Arizona State University

**P16 Joint Array and Spatial Sparsity Based Optimisation for DoA Estimation**

Mingyang Chen<sup>1</sup>, Mark Barnard<sup>1</sup>, Wenwu Wang<sup>1</sup>, <sup>1</sup>University of Surrey

**P17 Scanning Emitter TMA by Two Fixed Observers using Time of Interception**

Zhang Yifei<sup>1</sup>, Zhang Min<sup>1</sup>, Fucheng Guo<sup>1</sup>, <sup>1</sup>National University of Defense Technology

**P18 Enhanced-Range Intrusion Detection Using Pyroelectric Infrared Sensors**

Sami A Aldalahmeh<sup>1</sup>, Amer Hamdan<sup>1</sup>, Mounir Ghogho<sup>2</sup>, Desmond McLernon<sup>3</sup>, <sup>1</sup>Al-Zaytoonah University of Jordan, <sup>2</sup>University of Leeds/International University of Rabat, <sup>3</sup>University of Leeds

**P19 Knowledge-aided Adaptive Detection with Multipath Exploitation Radar**

Harun Hayvaci<sup>1</sup>, Utku Kumbul<sup>1</sup>, <sup>1</sup>TOBB University of Economics and Technology