

8:30 to 9:00 Refreshments

Session 1 – Imaging and Underwater Signal Processing - Chair Mike Davies, University of Edinburgh

9:00 Introduction and Welcome to Day 1/Session 1 – Mike Davies

9:05 – 9:35 Invited Speaker: Multi-Spectral and Multi-Modal Underwater Acoustic Imaging, Alan Hunter, University of Bath.

9:35 – 10:00 Fast Classification and Depth Estimation for Multispectral Single-Photon LiDAR Data, Mohamed Amir Alaa Belmekki¹, Steve McLaughlin¹, Abderrahim Halimi¹, ¹Heriot-Watt University.

10:00 – 10:25 Spaceborne SAR based assessment of nuclear test effects: the case of North Korea, Nicomino Fiscante¹, Filippo Biondi², Pia Addabbo³, Carmine Clemente⁴, Gaetano Giunta¹, Danilo Orlando⁵ ¹University of Study “Roma TRE”, ²University of Study of “L’Aquila”, ³University “Giustino Fortunato”, ⁴University of Strathclyde, ⁵University “Niccolo Cusano”.

10:25 – 10:50 The Maximal Eigengap Estimator for Acoustic Vector-Sensor Processing, Robert L Bassett¹, Jacob Foster¹, Kay Gemba², Paul Leary¹, Kevin B. Smith¹, ¹Naval Postgraduate School, ²U.S. Naval Research Laboratory.

10:50 – 11:20 Refreshments

Session 2 – Mixed Panel Discussion and Posters - Chair - Jordi Barr, Dstl

11:20 Introduction and Welcome to Session 2 – Jordi Barr

11:20 – 12:20 Mixed Panel Discussion: The defence sector is inherently risk-averse in the face of disruptive R&D. How would you enable more rapid adoption of novel, beneficial technology? Moderator, Jordi Barr, Dstl.

12:20 – 12:50 Lightning Presentations

- Joint surface detection and depth estimation from single-photon Lidar data using ensemble estimators, Kristofer Drummond¹, Agata Pawlikowska², Robert Lamb², Steve McLaughlin¹, Yoann Altmann¹, ¹Heriot-Watt University, ²Leonardo.
- Detecting LFM Parameters in Joint Communications and Radar Frequency Bands, Kaiyu Zhang¹, Fraser K Coutts¹, John Thompson¹, ¹University of Edinburgh.
- Joint Spatio-Temporal Bias Estimation and Tracking for GNSS-Denied Sensor Networks, Sofie J. J. Macdonald^{1,2}, James R Hopgood¹, ¹University of Edinburgh, ²Leonardo.
- Detection of Human Target Location Under Simulated Randomized Rubble Using Global Fresnel's Reflection Coefficient, Amit Sarkar¹, Debalina Ghosh¹, ¹Indian Institute of Technology Bhubaneswar.
- Semi-supervised domain adaptation via adversarial training, Antonin Couturier¹, Anton-David Almasan¹, ¹Thales.

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- Fast Givens Rotation Approach to Second Order Sequential Best Rotation Algorithms, Faizan Khattak¹, Stephan Weiss¹, Ian Proudler¹, ¹University of Strathclyde.
- Target Detection and Recognition of Ground Penetrating Radar using Morphological Image Analysis and Graph Laplacian Regularisation, Jun Dong¹, Vladimir Stankovic¹, Nigel Davidson², ¹University of Strathclyde, ²Dstl.
- Object Detection in EO/IR and SAR Images Using Low-SWAP Hardware, Richard O Lane¹, Adam Wragge¹, Wendy Holmes¹, Stuart Bertram¹, Tim Lamont-Smith¹, ¹QinetiQ.
- Exponential Filters for Passive Underwater Acoustic Detections - A Global Processing Gain Perspective, Stephane Blouin, Defence Research and Development Canada.

12:50 – 14:00 Lunch and Poster Presentations – There will be an opportunity to view posters either online or at Edinburgh.

Session 3 RF Sensing and Communications - Chair – Gary Heald, Dstl

14:00 Introduction and Welcome to Session 3 – Chair – Gary Heald

14:00 – 15:00 Defence Keynote Speaker: Why Defence Acquisition is Difficult, Hugh Griffiths, Defence Science Expert Committee (DSEC) / University College London.

15:00 – 15:25 An Approximate Likelihood Ratio Detector for QTMS Radar and Noise Radar, David Luong¹, Bhashyam Balaji², and Sreeraman Rajan², ¹Carleton University, ²Defence Research and Development Canada.

15:25 – 15:45 Refreshments

15:45 – 16:10 Detection of Weak Transient Signals Using a Broadband Subspace Approach, Stephan Weiss¹, Connor Delaosa¹, James Matthews², Ian Proudler¹, Ben Jackson³, ¹University of Strathclyde, ²PA Consulting, ³Dstl.

16:10 – 16:35 Rate Splitting Multiple Access for Multi-Antenna Multi-Carrier Joint Communications and Jamming, Onur Dizdar¹, Bruno Clerckx¹, ¹Imperial College London.

16:35 – 16:45 Closing remarks

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Wednesday 15th September 2021

8:30 to 9:00 Refreshments

Session 4 Distributed Processing and Tracking – Chair TBC

9:00 Introduction and Welcome to Day 2/Session 4– TBC

9:05 – 9:35 Invited Speaker: Optimising and Understanding the Impact of the NHS COVID-19 app Using Data Science Mark Briers, The Alan Turing Institute.

9:35 – 10:00 Adaptive Kernel Kalman Filter, Mengwei Sun¹, Mike E Davies¹, Ian Proudler², James R Hopgood², ¹University of Edinburgh, ²University of Strathclyde.

10:00 – 10:25 Detection of Malicious Intent in Non-cooperative Drone Surveillance, Jiaming Liang¹, Bashar I. Ahmad², Mohammed Jahangir³, Simon Godsill¹, ¹University of Cambridge, ²Aveillant Thales Land and Air Systems, ³University of Birmingham.

10:25 – 10:50 Modelling bi-static uncertainties in sequential Monte Carlo with the GLMB model, Murat Uney¹, Alexey Narykov¹, Jason F. Ralph¹, Simon Maskell¹, ¹University of Liverpool.

10:50 – 11:15 Graph Filter Design for Distributed Network Processing: A Comparison between Adaptive Algorithms, Atiyeh Alinaghi¹, Stephan Weiss¹, Vladimir Stankovic¹, Ian Proudler¹, ¹University of Strathclyde.

11:15 – 11:45 Refreshments

Session 5 – Mixed Panel Discussion – Chair - Stephen Ablett - Dstl

11:45 Introduction and Welcome to Session 5 – **Stephen Ablett, Dstl**

11:45 – 12:45 Mixed Panel Discussion: Implementation of technology, Moderator, Stephen Ablett, Dstl.

12:45 – 13:45 Lunch

Session 6 – Machine Learning and Information Processing – Chair TBC

13:45 Introduction and Welcome to Session 6 – Chair -

13:45– 14:45 Academic Keynote Speaker: Semantic Information Pursuit, René Vidal, Johns Hopkins Mathematical Institute for Data Science

14:45 – 15:15 Invited Speaker: AI-enabled Multi-Domain Processing and Analytics for Decision Making, Tien Pham, (CISD) U.S. DEVCOM ARL.

15:15 – 15:45 Refreshments

15:45 – 16:10 Approximate Proximal-Gradient Methods, Anis Hamadouche¹, Yun Wu¹, Andrew M Wallace¹, Joao Mota¹, ¹Heriot-Watt University.

16:10 – 16:35 Learning a Secondary Source From Compressive Measurements for Adaptive Projection Design, Fraser K Coutts¹, John Thompson¹, Bernard Mulgrew¹, ¹University of Edinburgh.

16:35– 16:45 Closing remarks