

International Conference on Synthetic Aperture Sonar and Synthetic Aperture Radar 2010

Proceedings of the Institute of Acoustics Volume 32 Pt.4

**Lerici, Italy
13-14 September 2010**

ISBN: 978-1-61738-957-3

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2010) by the Institute of Acoustics
All rights reserved.

Printed by Curran Associates, Inc. (2010)

For permission requests, please contact the Institute of Acoustics
at the address below.

Institute of Acoustics
77A St. Peter's Street
St. Albans Hertfordshire
AL1 3BN
United Kingdom

Phone: +44(0) 1727 848195

Fax: +44(0) 1727 850553

ioa@ioa.org.uk

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2634
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

Polarimetrically Persistent Scatterer Based Automatic Target Recognition	1
<i>E. Giusti, M. Martorella, A. Capria</i>	
Temporal Variability of Seafloor Roughness and its Impact on Coherent Change Detection	7
<i>Anthony P. Lyons, Daniel C. Brown</i>	
Estimation of Target Orientation in SAS Images	13
<i>Herman Midelfart, Øivind Midtgaard</i>	
New Synthetic Aperture Sonar Classification Mode for Mine Countermeasure Vessels	19
<i>N. Burtle, M. Chabah, E. Poirier</i>	
Synthetic Aperture Imaging via Backpropagation Using Commodity Graphics Processors	24
<i>Daniel A. Cook, Daniel P. Campbell</i>	
Autofocus for Circular Synthetic Aperture Imaging	31
<i>Hayden J. Callow, Stig A.V. Synnes, Torstein Olsmo Sæbø, Roy Edgar Hansen</i>	
Delineating Targets in SAR Images by Parallel Simulated Annealing	37
<i>Paul S. Cooper, Simon R. Potter</i>	
Detection of Spherical Inclusions Using Active Surfaces	43
<i>Daniel A. Cook, Francesco Fedele, Anthony J. Yezzi</i>	
Simultaneous Low and High frequency High Resolution SAS and a Statistical Method of Quantifying the Resolutions Obtained	51
<i>N.P. Glover, I Campbell</i>	
Simulation of Rippled-Sand Synthetic Aperture Sonar Imagery	56
<i>Shawn F. Johnson, Anthony P. Lyons</i>	
Processing SAR Data with Gaps in the Aperture: A Compressed Sensing Perspective	62
<i>Gabriel Rilling, Chaoran Du, Mike Davies, B. Mulgrew</i>	
Analysis of Shadow Contrast for Synthetic Aperture Sonar Imagery	68
<i>Daniel A. Cook, Daniel C. Brown</i>	
Interferometric Measurements Using Redundant Phase Centers of Synthetic Aperture Sonars	75
<i>James L. Prater, Jose E. Fernandez, John S. Stroud, Tesfaye G-Michael</i>	
Comparison Between Interferometric SAS and Interferometric SAR	81
<i>Torstein Olsmo Sæbø, Roy Edgar Hansen</i>	
Change Detection by Image Correlation for Synthetic Aperture Sonar	87
<i>Daniel D. Sternlicht, Tesfaye G-Michael</i>	
Study, Design and Concept of Low Frequency SAS	92
<i>Y. Pailhas, Y. Petillot, Chris Capus, R. Hollett</i>	
Automatic SAS Target Recognition Using Region Based Features and SVMs	98
<i>Paul Hill, David Bull, Alin Achim, David Gibson</i>	
Characterisation of Modulating Signatures within SAR Imagery	104
<i>Darren G. Muff, Matthew R. Nottingham, Daniel Andre, Brian C. Barber, David Blacknell, Hugh Griffiths</i>	
The Mine Penetration Sonar System: Design Theory, Design Simulator, Simulations	110
<i>R. Hollett</i>	
Canonical Correlation Analysis for Coherent Change Detection in Synthetic Aperture Sonar Imagery	117
<i>Tesfaye G-Michael, J. Derek Tucker</i>	
Classification Using Multiple Pass Fusion	123
<i>A. Wilby, J. Kent Harbaugh</i>	
Fractal Dimension Based Sand Ripple Suppression for Mine Hunting with Sidescan Sonar	126
<i>J.D.B. Nelson, N.G. Kingsbury</i>	
Compressive Sensing for Synthetic Aperture Sonar	132
<i>Jason C. Isaacs</i>	
Synthetic Aperture Sonar as a Tool for Deep Ocean Surveying	137
<i>A. Wilby</i>	
Detection of Double Scatterers in SAR Tomography	142
<i>Antonio Pauciullo, A. De Maio, Gianfranco Fornaro, Diego Reale</i>	
Data Fusion in a Multistatic Radar System	146
<i>Pietro Stinco, Maria Greco, Fulvio Gini</i>	
Inverse Forward Scatter SAR	152
<i>A. Myakinkov, A. Kuzin, M. Gashinova, V. Sizov, M. Cherniakov</i>	
Robust Synthetic Aperture Sonar for Autonomous Underwater Vehicles	157
<i>Roy Edgar Hansen</i>	

A Correlated K-Distributed Model for Seabed Reverberation in Synthetic Aperture Sonar Imagery	163
<i>Samantha Dugelay, Vincent Myers</i>	
Radar Waveform Design via Pareto-Optimal Theory	169
<i>A. De Maio, M. Piezzo, A. Farina, M. Wicks</i>	
GB-SAR and MIMO Radars: Alternative Ways of Forming a Synthetic Aperture	174
<i>Pier Francesco Sammartino, Dario Tarchi, Franco Oliveri</i>	
Target and Image Statistics for a Short-Range Synthetic Aperture Sonar	181
<i>Peter T. Gough, Michael P. Hayes</i>	
Constant-Envelope Waveform Design Techniques for Collocated MIMO Radar	187
<i>S. Ahmed, J.S. Thompson, Y. Petillot, B. Mulgrew</i>	
Target Recognition in Synthetic Aperture Sonar and High Resolution Side Scan Sonar Using AUVs	193
<i>Y. Petillot, Y. Pailhas, J. Sawas, N. Valeyrie, J. Bell</i>	
SAR Coherent Change Detection (CCD) over Mountainous Regions	202
<i>David Blacknell, Daniel Andre, Christopher M. Finch</i>	
Author Index	