

SAS 2009 – IEEE Sensors Applications Symposium Proceedings



17-19 February 2009
Royal Sonesta Hotel
New Orleans, LA, USA

Organized and sponsored by the IEEE Instrumentation and Measurement Society



TABLE OF CONTENTS

TUESDAY, FEBRUARY 17

The Future of Sensors and Sensor Networks- Survey Results Projecting the Next 5 Years	1
<i>K.R. Fowler</i>	
A Probabilistic Model for the Deployment of Sensors	7
<i>B. Carter, R. Ragade</i>	
Wireless Sensor Networks for Industrial Processes	13
<i>M. Antoniou, M.C. Boon, P.N. Green, P.R. Green, T.A. York</i>	
Matching Electronic Fingerprints of RFID Tags Using the Hotelling's Algorithm	19
<i>N. Saparkhojayev, D.R. Thompson</i>	
Evaluation of Key Distribution Protocols for use with Wireless Sensor Networks	25
<i>S. Moller, T. Newe, S. Lochmann</i>	
Toward Detection of Harmful Algae Blooms by In situ Surface Plasmon Resonance Spectroscopy	29
<i>S. Laurent, F. Colas, M. Hamelin, M. Crassous, E. Antoine, M. Lehaitre, C. Compere</i>	
Glucose Monitoring using Electromagnetic Waves and Microsensor with Interdigitated Electrodes	34
<i>O. Korostynska, A. Arshak, P. Creedon, K. Arshak, L. Wendling, A.I. Al-Shamma'a, S. O'Keefe</i>	
Design of a Real-time Biorecognition System to Detect Foodborne Pathogens- DNA Biosensor	38
<i>V. Velusamy, K. Arshak, O. Korostynska, K. Oliwa, C. Adley</i>	
Label-free Biosensor Based on Localized Surface Plasmon Resonance in a Multi-channel Microfluidic Chip	43
<i>C. Huang, J. Putzeys, J. Ye, G. Reekmans, K. Verhaegen, L. Lagae, K. Verstreken, G. Borghs</i>	
Label Free Electrical Detection of Salmonella Typhimurium Pathogens by Microcellular Trapping Channels	47
<i>C.R. Chaudhuri, R.D. Das, S.R. Chaudhuri, S. Maji, S. Das, H. Saha</i>	
Temperature Monitoring in Laser Assisted Polymer Bonding for MEMS Packaging Using a Thin Film Sensor Array	52
<i>Y. Liu, J. Zeng, C. Wang</i>	
Non-Destructive Method to Estimate the Moisture Content in Bread using Multi-Channel Electrical Impedance Spectroscopy	56
<i>C.M. Bhatt, J. Nagaraju</i>	
Single Si₃N₄ Layer on Dual Substrate for pH Sensing Micro Sensor	61
<i>S. Wang, C. Lai, C. Lue, C. Yang</i>	
Estimating the Moisture Content of Grain from Impedance and Phase Angle Measurements	65
<i>C.V. Kandala, J. Sundaram</i>	
Ultrasound Field Measuring Using Hydrophone for Quantitative Evaluation of Medical Ultrasonic Probe	70
<i>W.J. Yu, S.C. Noh, M.K. Park, H.K. Min, J.H. Park, H.H. Choi</i>	

On the (Im)possibility of Denial of Service Attacks Exploiting Authentication Overhead in WSNs	74
<i>V. Cionca, T. Newe, V. Dadarlat</i>	
Security for Wireless Sensor Networks: A Review	80
<i>M. Healy, T. Newe, E. Lewis</i>	
Study of the Quantitative Analysis of the Acoustic Field for the Performance Evaluation in the Medical Ultrasonic Probe	86
<i>P.M. Kyu, N.S. Cheol, Y.W. Jin, P.J. Hyun, M.H. Ki, C.H. Ho</i>	
Evaluation of Pavement Cracking Performance in the State of Rhode Island Using Falling Weight Deflectometer Data	90
<i>V. Jha, Y. Mehta, M. Byrne, F. Manning, E.J. Saridaki</i>	
Particle Filter Based Multisensor Fusion for Flaw Shape Reconstruction in Steam Generator NDE	95
<i>T. Khan, P. Ramuhalli</i>	
Automated Termite Sensing	99
<i>P. Wright, P.R. Green, B.D. Grieve, T.A. York, M. Hoppe</i>	
Wireless Sensors for a Wire-Independent Analysis of Fluid Networks	105
<i>D. Trincherio, R. Stefanelli, A. Galardini, B. Fiorelli</i>	
<u>WEDNESDAY, FEBRUARY 18</u>	
Sensors at Center for Advanced Sensors	109
<i>S.T. Griffin, C.E. Halford, D.J. Russomanno</i>	
Capacitive Techniques to Monitor Anchoring Energy in Liquid Crystal-Based Sensors	114
<i>J. Namkung, Y. Zou, A. Hassanzadeh, A.S. Abu-Abed, R. Lindquist</i>	
Managing Sensor Deployments with Geographic Information Systems	118
<i>Y. Trittenko, D.J. Russomanno, Q. Qiu</i>	
3D Laser Scanner and Profiler for Application to Border Security	124
<i>T. Layton, E.L. Jacobs, S.T. Griffin</i>	
Acquisition, Interfacing and Analysis of Sensor Measurements in a VR Environment for Integrated Systems Health Management in Rocket Engine Tests	128
<i>M. Russell, G.D. Lecakes Jr., S. Mandayam, J.A. Morris, M. Turowski, J.L. Schmalzel</i>	
Visualization of Multiple Sensor Measurements in a VR Environment for Integrated Systems Health Management in Rocket Engine Tests	132
<i>G.D. Lecakes Jr., M. Russell, S. Mandayam, J.A. Morris, J.L. Schmalzel</i>	
Implementation of an IEEE 1451.1 Compatible Multiple NCAP Controller using LabView	137
<i>R. Franzl, D. Gurkan</i>	
Sensing of Multiple Unrelated Tire Parameters Using Electrically Open Circuit Sensors Having No Electrical Connections	142
<i>C. Wang, S.E. Woodard, B.D. Taylor</i>	
3D Orientation Tracking Based on Unscented Kalman Filtering of Accelerometer and Magnetometer Data	148
<i>B. Huyghe, J. Doutreloigne, J. Vanfleteren</i>	
Wireless Instrumented Sphere For Three-Dimensional Force Sensing	153
<i>I. Muller, R.M. De Brito, C.E. Pereira, R.J. Bender</i>	

Processing Biometric Data of Game Players Using Body Sensors	158
<i>J.A. Madni, J. Lee</i>	
Application of ZigBee for Pollution Monitoring Caused by Automobile Exhaust Gases	164
<i>H. Eren, A. Al-Ghamdi, J. Luo</i>	
FARMS: Fusionable Ambient Renewable MACS	169
<i>V. Iyer, S.S. Iyengar, N. Balakrishnan, V. Phoha, M.B. Srinivas</i>	
Using Dynamic Partial Reconfiguration Approach to Read Sensor with Different Bus Protocol	175
<i>C.S. Ibala, K. Arshak</i>	
Near-field Acoustic Holography for Acoustic Noise Source Identification in Turbomachinery	180
<i>T. Khan, P. Ramuhalli, R. Raveendra, W. Zhang</i>	
Real-time Heart Rate Variability Detection on Sensor Node	184
<i>K. Wong</i>	
Spectral Kurtosis based System for Transients' Detection: Application to Termite Targeting	188
<i>J.J.G. De La Rosa, A. Moreno-Munoz, A. Gallego, R. Piotrkowski, E. Castro</i>	
PEARSH: A Power Efficient Algorithm for Raising Sensor Half-Life With Wireless Battery Recharge Module	194
<i>O. Adeluyi, S. Moh, J. Lee</i>	

THURSDAY, FEBRUARY 19

Ultra-thin, and Flexible Physiological Monitoring System	200
<i>H.K. Charles Jr., R.P. Cain</i>	
Design of Specific DNA Primers to Detect the Bacillus Cereus Group Species	206
<i>C. Adley, K. Arshak, C. Molnar, K. Oliwa, V. Velusamy</i>	
Optical Sensor System for Non-invasive Blood Diagnosis	210
<i>U. Timm, E. Lewis, D. McGrath, J. Kraitl, H. Ewald</i>	
Optical Tracking of the Director Axis in Liquid Crystal Sensors	215
<i>A.S. Abu-Abed, R.G. Lindquist</i>	
Integrated Personal Dosimeter	219
<i>P. Hansen</i>	
Optimal Spatial Sampling of Hyperspectral Imagery for Fusion with Panchromatic Video in Multitarget Tracking	225
<i>B.R. Secrest, J.R. Vasquez</i>	
Testing a Partial Reconfiguration based Design for Sensor Reading	231
<i>C.S. Ibala, K. Arshak</i>	
Multisensor Data Fusion Methods for Petroleum Engineering Applications	235
<i>A. Abdelgawad, Z. Merhi, M. Elgamel, M. Bayoumi</i>	
Optimal Image Fusion Using the Rayleigh Quotient	239
<i>M. Kumar</i>	
Use of Ultrasonic Sensors in the Development of an Electronic Travel Aid	245
<i>C. Gearhart, A. Herold, B. Self, C. Birdsong, L. Silovsky</i>	
IEEE 1451.0 Compatible TEDS Creation Using .NET Framework	251
<i>S. Manda, D. Gurkan</i>	

Low-Cost, Smart Temperature Sensors Systems Based on Universal Frequency-to-Digital Converter	257
<i>S.Y. Yurish</i>	
A Multi-port Serial NCAP using the IEEE 1451 Smart Transducer Standard.....	263
<i>D. Wobschall, A. Stepanenko, I. Maykiv, R. Kochan, A. Sachenko, V.Kochan</i>	
Integration of IEEE 1451 Smart Transducers and OGC-SWE Using STWS	268
<i>E.Y. Song, K. Lee</i>	
Emulated Network of IEEE 1451 Application with Multiple Smart Sensor Reports	274
<i>S. Gumudavelli, D. Gurkan, R. Wang</i>	
A ZigBee Wireless Sensor Network Compliant with the IEEE1451 Standard.....	279
<i>J. Higuera, J. Polo, M. Gasulla</i>	
Load Balanced Clustering Algorithm for Energy Efficient Home Area Networking.....	284
<i>S.A. Khan, F.A. Khan, A. Shahid, Z.A. Khan</i>	
Internet Metadata Framework for Plug and Play Wireless Sensor Networks	290
<i>J. Sung, Y. Kim, T. Kim, Y. Kim, D. Kim</i>	
Author Index	