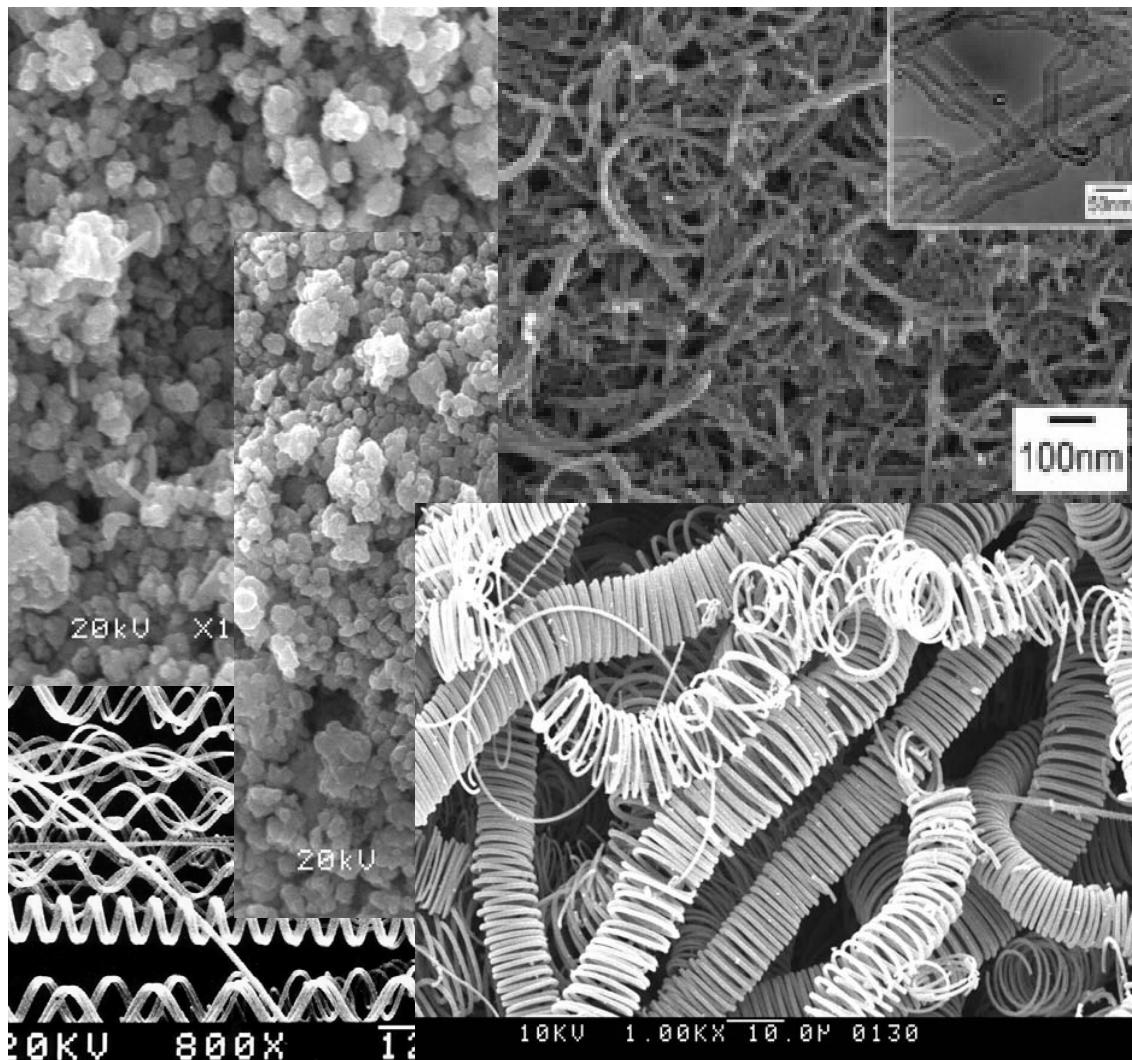


PROCEEDINGS OF THE
**Third International Conference on
Sensing Technology**

National Cheng-Kung University, Tainan, Taiwan
November 30 – December 3, 2008



The Third International Conference on Sensing Technology (ICST 2008)

Table of Contents

S1: Keynote Address #1

- Effective design of WSNs: from the lab to the real world**1
Cesare Alippi (Politecnico di Milano, Italy); Romolo Camplani (Politecnico di Milano, Italy); Cristian Galperti (Politecnico di Milano, Italy); Manuel Roveri (Politecnico di Milano, Italy)

S2: Sensors for Radar and Gyroscope

- Automotive Radar Data Filtering Approach for Adaptive Cruise Control Systems**10
Maryam Gholamhosseini (K.N.Toosi University of Technology, Iran); Hamid Khaloozadeh (K.N.Toosi University of Technology, Iran)
- Opportunities for imaging in distributed robotics applications with ultra-wideband radars**15
Jairo Alejandro Gomez (The University of Sydney, Australia); Graham Brooker (The University of Sydney, Australia)
- The research on the performance of the Micro-machined gyroscope at low ambient pressure.....**21
Qiancheng Zhao (Peking University, P.R. China); Longtao Lin (Peking University, P.R. China); Jian Cui (Peking University, P.R. China); Dachuan Liu (Peking University, P.R. China); Xiaozhu Chi (Peking University); Guizhen Yan (Peking University, P.R. China)
- Compensation of Interface Circuit Errors for MEMS Gyroscopes Using State Observers**25
Chien-Yu Chi (National Chiao Tung University, Taiwan); Yen-Pin Peng (National Chiao Tung University, Taiwan); Tsung-Lin Chen (National Chiao Tung University, Taiwan)

S3: Ultrasonic Sensors

- A Scalable Tracking System Using Ultrasonic Communication**31
Toshio Ito (University of Tokyo, Japan); Tetsuya Sato (University of Tokyo, Japan); Kan Tulathimutte (University of Tokyo, Japan); Masanori Sugimoto (University of Tokyo, Japan); Hiromichi Hashizume (National Institute of Informatics, Japan)
- Laser-Ultrasonic Sensing of Surface Temperature Distribution of a Material being Heated.....**37
Ikuo Ihara (Nagaoka University of Technology, Japan); Manabu Takahashi (Nagaoka University of Technology, Japan); Keisuke Katoh (Nagaoka University of Technology, Japan)
- Determination of phase angles in complex modulated ultrasonic signals using probability density distributions**42
Oliver Ricken (University of Duisburg-Essen, Germany); Volker Hans (University of Duisburg-Essen, Germany)
- A Remotely Interrogatable Passive Microactuator using SAW Correlation**46
Ajay C Tikka (University of Adelaide, Australia); Said F Al-Sarawi (The University of Adelaide, Australia); Derek Abbott (University of Adelaide, Australia)

S4: Sensors for Imaging/Image and Speech/Audio

Haar-like Filtering based Speech Detection using Integral Signal for Sensornet	52
<i>Jun Nishimura (Keio University, Japan); Tadahiro Kuroda (Keio University, Japan)</i>	
Heterodyne Range Imaging in Real-time	57
<i>A.P.P. Jongenelen (Victoria University of Wellington, New Zealand); D.A. Carnegie (Victoria University of Wellington, New Zealand); A.A. Dorrington (University of Waikato, New Zealand); A.D. Payne (University of Waikato, New Zealand)</i>	
A Pattern Image Based Approach for Characterising Electronic Crosstalk in High Speed Charge Coupled Devices	63
<i>B.S. Binu (KLA Tencor, USA); Z. Guowu (KLA Tencor, USA); Venkat Iyer (KLA Tencor, USA); V Jayashankar (Indian Institute of Technology, India)</i>	
A wide dynamic range integrating pixel with an accurately controlled logarithmic response ...	68
<i>Hsiu-Yu Cheng (University of Oxford, United Kingdom); Steve Collins (University of Oxford, United Kingdom)</i>	

S5: Gas & Bio-Sensors

Wide dynamic range hydrogen sensing using silver-rutile Schottky diode	72
<i>Faramarz Hossein-Babaei (K.N. Toosi University of Technology, Iran); Mohsen Purahmad (K.N. Toosi University of Technology, Iran)</i>	
Integrating Micro Array Bio-Sensing Probes with Semiconductor Amplifier on a Flexible Substrate	76
<i>Jium-Ming Lin (Chung-Hua University, Taiwan); Po-Wei Lin (Taipei Medical University, Taiwan); Li-Chern Pan (Taipei Medical University, Taiwan)</i>	
A CMOS-Based Phototransistor for High-Sensitivity Biochemical Detection Using Absorption Photometry	82
<i>Yu-Wei Chang (National Chiao Tung University, Taiwan); Yu-Ting Tai (National Chiao Tung University, Taiwan); Yang-Tung Huang (National Chiao Tung University, Taiwan); Yuh-Shyong Yang (National Chiao Tung University, Taiwan)</i>	
High Sensitive, Colorimetric, Isothermal Nucleic Acids Amplification: A Versatile Platform for Protein Biosensors	86
<i>Ming-Yu Lin (Instrument Technology Research Centre, Taiwan); Yu-Wei Chang (National Chiao Tung University, Taiwan); Yu-Ting Tai (National Chiao Tung University, Taiwan); Yuh-Shyong Yang (National Chiao Tung University, Taiwan); Yang-Tung Huang (National Chiao Tung University, Taiwan)</i>	
Thick Film of CuGeO₃ as a H₂S Gas Sensor	90
<i>Y.R. Baste (Arts, Commerce and Science College, India); V.B. Gaikwad (K.T.H.M. College, India); A.V. Borhade (H.P.T. Arts & R.Y.K. Science College, India); G.H. Jain (Arts, Commerce and Science College, India); D.D. Kajale (Arts, Commerce and Science College, India)</i>	
Development of Exhaled Breath Assay Devices using Functionalized Quartz Sensors	94
<i>Al. Palaniappan (Nanyang Technological University, Singapore); Teo A.L. Melissa (DSO National Laboratories, Singapore); Shabbir Moothala (DSO National Laboratories, Singapore); Francis E.H. Tay (National University of Singapore, Singapore); S.G. Mhaisalkar (Nanyang Technological University, Singapore)</i>	

S6: Wireless Sensors and Network - I

A Clustered Response Mechanism to Discover the Topology of Wireless Sensor Networks with an Application to Network Management at Faulty and Operational State of Nodes	98
<i>Mahdi Nasrullah Al-Ameen (Bangladesh University of Engineering and Technology, Bangladesh)</i>	
Energy-aware Mobile Element Scheduling in Wireless Sensor Networks	107
<i>K. Indra Gandhi (Anna University, India); P. Narayanasamy (Anna University, India)</i>	
An Energy-Efficient Routing Protocol in Underwater Sensor Networks	114
<i>Chun-Hao Yang (National Cheng Kung University, Taiwan); Kuo-Feng Ssu (National Cheng Kung University, Taiwan)</i>	
NRP: Neighbour-Based Mobicast Protocol and SNRP: Spatial Neighbour-Based Mobicast Protocol for Wireless Sensor Networks	119
<i>S. Gheisari (Islamic Azad University, Iran); A.T. Haghighat (Islamic Azad University, Iran); P. Rahmani (Islamic Azad University, Iran); A. Osmani (Islamic Azad University, Iran)</i>	
Corrugated Micro-Diaphragm Analysis for Low-Powered and Wireless Bio-MEMS	125
<i>Don Dissanayake (University of Adelaide, Australia); Said Al-Sarawi (University of Adelaide, Australia); Derek Abbott (University of Adelaide, Australia)</i>	

Level Based Clustering in Wireless Sensor Networks	130
<i>Garimella Rama Murthy (International Institute of Information Technology, India); Vasanth Iyer (International Institute of Information Technology, India); V. Bhawani Radhika (National Institute of Technology, India)</i>	

S7: Vision Sensors

A Kind of Stereovision Measurement Device Based on Binocular Omni-Directional Vision Sensor	135
<i>TANG Yi-ping (Zhejiang University of Technology, P.R. China); LIANG Yan (Zhejiang University of Technology, P.R. China); YANG Guan-bao (Zhejiang University of Technology, P.R. China); ZHOU Zong-si (Zhejiang University of Technology, P.R. China); ZHU Yi-hua (Zhejiang University of Technology, P.R. China)</i>	
PTZ Camera Based Position Tracking in IP-Surveillance System	142
<i>Chu-Sing Yang (National Cheng Kung University, Taiwan); Ren-Hao Chen (National Cheng Kung University, Taiwan); Chao-Yang Lee (National Cheng Kung University, Taiwan, Taiwan); Shou-Jen Lin (National Cheng Kung University, Taiwan)</i>	
Vision Based Robotic Person Following Under Lighting Variations	147
<i>Mahmoud Tarokh (San Diego State University, USA); Paulo Merlotti (San Diego State University, USA); John Duddy (San Diego State University, USA); Malrey Lee (Chonbuk National University, Korea)</i>	
3-D shape measurement of a free surface from a single image produced using multiple laser spots	153
<i>Yuichiro Oya (University of Miyazaki, Japan); Masashi Ikeuchi (University of Miyazaki, Japan); Kikuhito Kawasue (University of Miyazaki, Japan)</i>	
Vision-Based Particle Velocity Measurement in Granular Gas-Solid Flows with Special Focus on Knowledge Transfer	158
<i>A. Fuchs (Graz University of Technology, Austria); H. Zangl (Graz University of Technology, Austria); D. Watzenig (Graz University of Technology, Austria); P. Dollfuß (Graz University of Technology, Austria)</i>	
Reconfigurable Foveated Active Vision System	162

Donald G. Bailey (Massey University, New Zealand); Christos-Savvas Bouganis (Imperial College London, United Kingdom)

S8: Wireless Sensors and Network - II

Wireless Stereo Vision System Development for Rotary-wing UAV Guidance and Control	168
<i>Seunghyun Lee (Seoul National University, Korea); Seungho Yoon (Seoul National University, Korea); Hyoun Jin Kim (Seoul National University, Korea); Youdan Kim (Seoul National University, Korea)</i>	
An Energy Saving Strategy for Object Tracking in Sensor Networks by Mining Seamless Temporal Moving Patterns	174
<i>Vincent S. Tseng (National Cheng Kung University, Taiwan); Ming-Hua Hsieh (National Cheng Kung University, Taiwan)</i>	
A Novel Mechanism of Low Power Consumption for Wireless Sensor Networks	179
<i>Ya-Chun Li (Tamkang University, Taiwan); J.H. Change (Tamkang University, Taiwan); Wei-Tsong Lee (Tamkang University, Taiwan)</i>	
A Minimalist One-Determinant Tuning Power Scheme in Wireless Sensor Networks	185
<i>S.H. Shen (National Cheng Kung University, Taiwan); Y.M. Huang (National Cheng Kung University, Taiwan); S.S. Hung (WuFeng Institute of Technology, Taiwan)</i>	
C-ERROR Simulator for Development for Sensor and Location Aware Sensing Applications.....	192
<i>Vasanth Iyer (International Institute of Information Technology, India); G. Rama Murthy (International Institute of Information Technology, India); M.B. Srinivas (International Institute of Information Technology, India); Bertrand Hochet (University of Applied Sciences, Switzerland)</i>	

S9: Sensors Fusion and Novel Applications

A Robust Two-Stage Multisensor Fusion in Contaminated Gaussian Channel Noise.....	200
<i>Nga-Viet Nguyen (Gwangju Institute of Science and Technology, Korea); Georgy Shevlyakov (Gwangju Institute of Science and Technology, Korea); Vladimir I. Shin (Gwangju Institute of Science and Technology, Korea)</i>	
Multi-sensor Data Fusion in Automotive Applications	206
<i>Thomas Herpel (University of Erlangen-Nuremberg, Germany); Christoph Lauer (University of Erlangen-Nuremberg, Germany); Reinhard German (Universitaet Erlangen-Nuernberg, Germany); Johannes Salzberger (Audi AG, Germany)</i>	
Multi-Target Tracking Based on Data Fusion and Distributed Detection in Sensor Networks.....	212
<i>Juo-Yu Lee (UCLA, USA); Kung Yao (UCLA, USA)</i>	
Direct Gravity Estimation and Compensation in Strapdown INS Applications	218
<i>Ehad Akeila (University of Auckland, New Zealand); Zoran Salcic (The University of Auckland, New Zealand); Akshya Swain (University of Auckland, New Zealand)</i>	

Improving the Resolution of Non-Invasive Time Domain Reflectometry	224
<i>Ian G. Platt (Lincoln Ventures Ltd, New Zealand); Ian M. Woodhead (Lincoln Ventures Ltd, New Zealand)</i>	

S10: Application of NN/ANN in Sensors

MBIR Reflectance Spectrometry for Deep Trench Structure with ANN and Levenberg-Marquardt Combined Algorithm	234
--	-----

Chuanwei Zhang (Huazhong University of Science and Technology, P.R. China); Shiyuan Liu (Huazhong University of Science and Technology, P.R. China); Tielin Shi (Wuhan National Laboratory for Optoelectronics, P.R. China)

Three Dimensional Evaluation of Parallelepiped Flaw using Amorphous MI Sensor and Neural Network in Biaxial MFLT238

Masataka Abe (Kyoto University, Japan); Shiro Biwa (Kyoto University, Japan); Eiji Matsumoto (Kyoto University, Japan)

Incremental PNN Classifier for a Versatile Electronic Nose242

Nabarun Bhattacharyya (C-DAC, Kolkata, India); Bipan Tudu (Jadavpur University, India); Animesh Metla (Jadavpur University, India); Arun Jana (C-DAC, Kolkata, India); Rajib Bandyopadhyay (Jadavpur University, India)

Prediction of RFID Tag Detection for a Stationary Carton Box248

Minho Jo (Korea University, Korea); Si-Ho Cha (Sejong University, Korea); Hyunseung Choo (Sungkyunkwan University, Korea); Hsiao-Hwa Chen (National Cheng Kung University, Taiwan)

Comparison of Multivariate Normalization Techniques as Applied to Electronic Nose Based Pattern Classification for Black Tea254

Bipan Tudu (Jadavpur University, India); Nabarun Bhattacharyya (C-DAC, Kolkata, India); Bikram Kow (Jadavpur University, India); Rajib Bandyopadhyay (Jadavpur University, India)

S12: Poster Session

A Sensitive Detection Electronics for Resistive Sensor259

T. Islam (Jamia Millia Islamia (Central University), India); F.A. Siddiqui (Jamia Millia Islamia (Central University), India); S.A. Khan (Jamia Millia Islamia (Central University), India); S.S. Islam (Jamia Millia Islamia (Central University), India)

A New Wavelet De-nosing Algorithm Based on Reversible Transform265

Ma Heng (Naval University of Engineering, P.R. China); Xu Jiangning (Naval University of Engineering, P.R. China); Zhu Tao (Naval University of Engineering, P.R. China)

Research on Rotating Encoder Zero-Position Location Based on Missile Steering Gear269

Huang Yu-Ping (Harbin Institute of Technology, P.R. China); Wu Hong-xing (Harbin Institute of Technology, P.R. China); Kou Bao-quan (Harbin Institute of Technology, P.R. China); Li Li-yi (Harbin Institute of Technology, P.R. China)

Research on temperature dependent characteristics and compensation methods for digital gyroscope273

Dachuan Liu (Peking University, P.R. China); Xiaozhu Chi (Peking University, P.R. China); Jian Cui (Peking University, P.R. China); Longtao Lin (Peking University, P.R. China); Qiancheng Zhao (Peking University, P.R. China); Zhenchuan Yang (Peking University, P.R. China); Guizhen Yan (Peking University, P.R. China)

Controller Design by Dynamic Output Sensing for Linear Partly-Quantized Feedback Control Systems278

Vahid Sotoudeh Nejad (Isfahan University of Technology, Iran); Javad Askari (Isfahan University of Technology, Iran); Saeed Hosseini (Isfahan University of Technology, Iran)

Design of sensor setup and study of humidity sensing behaviour of conducting polyaniline / ceramic composites284

Machappa. T. (Gulbarga University, India); Koppalkar R. Anilkumar (Gulbarga University, India); M. Sasikala (Noble College of Engineering and Technology for Women, India); M V N Ambika Prasad (Gulbarga University, India)

The Study of ZnSe/GaAs MSM Photodetector Using Selective-area Epitaxy Method	289
<i>M.Y. Cheng (National Taiwan Ocean University, Taiwan); C.C. Chang (National Taiwan Ocean University, Taiwan)</i>	
Experimental Investigations on Reconfigurable Stewart platform for Contour Generation	292
<i>G. Satheesh Kumar (Indian Institute of Technology Madras, India); T. Nagarajan (Universiti Teknologi Petronas (UTP), Malaysia)</i>	
A High-Sensitivity CMOS-Compatible Immunosensor Based on the HRP/TMB/Streptavidin System	297
<i>Yu-Ting Tai (National Chiao Tung University, Taiwan); Yu-Wei Chang (National Chiao Tung University, Taiwan); Ming-Yu Lin (national Chiao Tung University, Taiwan); Yuh-Shyong Yang (National Chiao Tung University, Taiwan); Yang-Tung Huang (National Chiao Tung University, Taiwan)</i>	
Scaling Effect Research on Micro-Machined Gas-Pendulum Dual-Axis Tilt Sensors	301
<i>Chen Chen (China Academy of Machine Science & Technology, P.R. China); Qiushi Han (Beijing Information Science & Technology University, P.R. China); Fuxue Zhang (Beijing Information Science & Technology University, P.R. China)</i>	
Evaluation of cross-validation formulas for choosing the regularization parameter for inversion of Fredholm integral of the first kind with non-negativity constraints	307
<i>Carlo Pariset (Newcastle University, United Kingdom); Suresh N. Thennadil (Newcastle University, United Kingdom)</i>	
Breath Flow Sensing via Spirometric Instrumentation: Pathology Prediction Using a Genetic Algorithm	313
<i>Aime' Lay-Ekuakille (University of Salento, Italy); G. Vendramin (University of Salento, Italy); A. Trotta (University of Salento, Italy)</i>	
A 3D Online Monitoring System	318
<i>Junichi Takeno (Meiji University Graduate School, Japan); Toshihiro Enaka (Meiji University Graduate School, Japan); Hirofumi Sato (Meiji University Graduate School, Japan)</i>	
A multiple phase demodulation method for high resolution of the laser range finder	324
<i>Heesun Yoon (Gwangju Institute of Science and Technology, Korea) Jinpyo Hong (Gwangju Institute of Science and Technology, Korea); Seonggu Kang (Gwangju Institute of Science and Technology, Korea); Kyihwan Park (Gwangju Institute of Science and Technology, Korea)</i>	
Accident Avoidance of Fighter Pilots by Stress Monitoring with Wireless Sensors in BAN	329
<i>Goutam Chatterjee (Thakral College of Technology, India); A. Somkuwar (Maulana Azad National Institute of Technology, India)</i>	
The Mechanisms to Decide on Caching a Packet on Its Way of Transmission to a Faulty Node in Wireless Sensor Networks Based on the Analytical Models and Mathematical Evaluations	336
<i>Mahdi Nasrullah Al-Ameen (Bangladesh University of Engineering and Technology, Bangladesh); MD. Rakib Hasan (Bangladesh University of Engineering and Technology, Bangladesh)</i>	
Online Monitoring System in Development of Rural Area	342
<i>Dharm Singh Jat (Maharana Pratap University of Agriculture and Technology, India); Chih-Heng Ke (National Kinmen Institute of Technology, Taiwan); Poonam Dhaka (Maharana Pratap University of Agriculture and Technology, India)</i>	
Design an Interface/Network Selection Mechanism for Multi-Interface FMIPv6 Protocol	348
<i>O.M. Raoof (Brunel University, United Kingdom); H.S. Al-Raweshidy (Brunel University, United Kingdom)</i>	

Beacon-Aided Adaptive Azimuth-Elevation Localization of Sound-Sources Aboard a Pass-By Rail-Car Using a Track-Side Acoustic Microphone Planar Array	354
<i>Yue Ivan WU (Hong Kong Polytechnic University, Hong Kong); Kainam Thomas WONG (Hong Kong Polytechnic University, Hong Kong); Siu-kit LAU (Hong Kong Polytechnic University, Hong Kong)</i>	
Ultrasound transducer sensitivity in non linear parameter measurement	359
<i>Djilali Kourtiche (NANCY Université, France); Mustapha Nadi (NANCY Université, France); Amar Rouane (NANCY Université, France); Ahmed Chitnalah (Cadi Ayad University, Morocco)</i>	
Low Complexity Fusion Estimation Algorithms in Multisensor Environment	364
<i>Seokhyoung Lee (Gwangju Institute of Science and Technology, Korea); Ilyoung Song (Gwangju Institute of Science and Technology, Korea); Vladimir Shin (Gwangju Institute of Science and Technology, Korea)</i>	
Bleustein-Gulyaev waves in a functionally graded piezoelectric half-space with exponential variation	370
<i>Zheng-Hua Qian (Tokyo Institute of Technology, Japan); Feng Jin (Xi'an Jiaotong University, P.R. China); Tianjian Lu (Xi'an Jiaotong University, P.R. China); Kikuo Kishimoto (Tokyo Institute of Technology, Japan)</i>	
A Secured Model for trusted communication in Network using ZERO INTERACTION AUTHENTICATION	374
<i>R. Pugazendi (KSR College of Arts and Science, India); E. Jayabalani (KSR College of Arts and Science, India); K. Duraiswamy (KSR College of Technology, India)</i>	
A Software Design Method in the Field of Industrial Control	379
<i>Yunfei Li (Soochow University, P.R. China); Wei He (Soochow University, P.R. China)</i>	
Adaptive CRN Spectrum Sensing Scheme with Excellence in Topology and Scan Scheduling	384
<i>Gong Runsheng (Chongqing Communication Institute of P.L.A., P.R. China); Hu Zhongyu (Chongqing Communication Institute of P.L.A., P.R. China); Shen Tao (Chongqing Communication Institute of P.L.A., P.R. China)</i>	
Design and Power Consumption Simulation of an E-Textile in Two Conditions	392
<i>E. Shahhaidar (Iran University of Science and Technology, Iran); M.M. Nezamabadi (Iran University of Science and Technology, Iran)</i>	
The Design of Indirect Measurement Systems based on OE Models	397
<i>João V. da Fonseca Neto (Universidade Federal do Maranhão, Brazil); Renan Lima Pereira (Universidade Federal do Maranhão, Brazil); Marcio Cerqueira Mendes (Universidade Federal do Maranhão, Brazil); Gustavo A. Andrade (Universidade Federal do Maranhão, Brazil)</i>	
Study on a Pyruvate Oxidase Biosensor Based on β-Cyclodextrin Included Ferrocene as Electron-transfer Mediator	403
<i>Tu Yifeng (Suzhou University, P.R. China); Long Yumei (Suzhou University, P.R. China); Deng Kejun (Suzhou University, P.R. China)</i>	
Rust Classification using Image Analysis of Steel Structures	409
<i>Eiichiro Momma (Nihon University, Japan); Yuka Kimura (Nihon University, Japan); Hiromitsu Ishii (Nihon University, Japan); Takashi Ono (Nihon University, Japan); Makoto Harada (Asahi Etic Co., Ltd., Japan); Takefumi Aoyama (Asahi Etic Co., Ltd., Japan); Tomoyuki Higuchi (Asahi Etic Co., Ltd., Japan)</i>	
New Type Thin Film Vacuum Sensor Using the Short Circuit Seebeck-Current Detection Type Thermocouple	414

Noriaki Takashima (Tohoku-Gakuin University, Japan); Mitusteru Kimura (Tohoku-Gakuin University, Japan)

Enhanced LPG response characteristics of SnO₂ thin film based sensors loaded with Pt clusters418

Divya Haridas (University of Delhi, India); Arijit Chowdhuri (University of Delhi, India); K. Sreenivas (University of Delhi, India); Vinay Gupta (University of Delhi, India)

Gas Sensing Performance of Pure and Modified SrTiO₃ Thick Film Resistors422

D.D. Kajale (Arts, Commerce and Science College, India); V.B. Gaikwad (K.T.H.M. College, India); G.H. Jain (Arts, Commerce and Science College, India); P.K. Khanna (C-MET, India)

Study on Partial Discharge Localization by Ultrasonic Measuring in Power Transformer Based on Particle Swarm Optimization426

LUO Ri-cheng (North China Grid Company Limited, P.R. China); BAI Kai (North China Electric Power Research Institute, China); LIU Shao-yu (North China Electric Power Research Institute, P.R. China)

Research on Position Sensor Magnetic Encoder Based on the Elevator Door Machine Servo System431

Jia Yu-hui (Ropen Technology Co., P.R. China); Wu Hong-xing (Harbin Institute of Technology, P.R. China); Kou Bao-quan (Harbin Institute of Technology, P.R. China); Li Li-Yi (Harbin Institute of Technology, P.R. China)

Research for Brushless Motor Controller using Winding Back-EMF to Detect Rotor Position..........435

Wu Hong-xing (Harbin Institute of Technology, P.R. China); Liu Ying (Harbin Institute of Technology, P.R. China); Kou Bao-quan (Harbin Institute of Technology, P.R. China); Li Li-yi (Harbin Institute of Technology, P.R. China)

Estimation of Induction Motor Field Efficiency for Energy Audit and Management Using Genetic Algorithm440

M.S. Aspalli (P.D.A. College of Engineering, India); S.B. Shetagar (P.D.A. College of Engineering, India); S.F. Kodad (Arora Engineering College, India)

Design of Omni-Directional Vision Sensors without dead angle446

TANG Yiping (ZheJiang University of Technology, P.R. China); Chen Longyan (ZheJiang University of Technology, P.R. China); Yan Haidong (ZheJiang University of Technology, P.R. China); Zhu Yihua (ZheJiang University of Technology, P.R. China)

Remote Full-axis Deformation Sensing with Optical Vortex Beam for Health Monitoring of Infrastructures452

Seichi Sato (University of Tokyo, Japan); Ikumatsu Fujimoto (CREST, Japan Science and Technology Agency, Japan); Toru Kurihara (University of Tokyo, Japan); Shigeru Ando (University of Tokyo, Japan)

Accuracy Assessment of Sensed Biomedical Images for Myocardial Infarction Prediction457

A. Lay-Ekuakille (University of Salento, Italy); G. Vendramin (University of Salento, Italy); A. Trotta (Polytechnic of Bari, Italy); I. Sgura (University of Salento, Italy); T. Zielinski (AGH University of Science and Technology, Poland); P. Turcza (AGH University of Science and Technology, Poland)

S14: Capacitive Sensors

Planar Interdigital Sensors Based Looseness Estimation of Leather462
V. Kasturi (Massey University, New Zealand); S.C. Mukhopadhyay (Massey University, New Zealand)

Modeling of capacitive sensor filled with elastic dielectrics and its advantages467

O.P. Thakur (*Netaji Subhas Institute of Technology, India*); Anjani Kumar Singh (*Netaji Subhas Institute of Technology, India*)

Flow velocity Determination in Cryogenic Media by Means of Capacitive Sensing472
Gert Holler (*Graz University of Technology, Austria*); Anton Fuchs (*Graz University of Technology, Austria*); Daniel Hrach (*Graz University of Technology, Austria*)

S15: Fibre-Optic Sensors

Measurements of Cerenkov Radiations in a Scintillating Fiber-optic Dosimeter using a Photodiode and a Charge-coupled Device477

Kyoung Won Jang (*Konkuk University, Korea*); Sang Hun Shin (*Konkuk University, Korea*); Dong Hyun Cho (*Konkuk University, Korea*); Wook Jae Yoo (*Konkuk University, Korea*); Jeong Ki Seo (*Konkuk University, Korea*); Soon-Cheol Chung (*Konkuk University, Korea*); Bongsoo Lee (*Konkuk University, Korea*); Byung Gi Park (*Soonchunhyang University, Korea*); Joo Hyun Moon (*Dongguk University, Korea*); Hyosung Cho (*Yonsei University, Korea*); Sin Kim (*Cheju National University, Korea*)

Fabrication of Highly Efficient Fibre-Optic Gas Sensors Using SiO₂/Polymer Nanoporous Thin Films481

Suguru Kodaira (*The University of Kitakyushu, Japan*); Sergiy Korposh (*The University of Kitakyushu, Japan*); Seung-Woo Lee (*The University of Kitakyushu, Japan*); William J. Batty (*Cranfield University at Kitakyushu, Japan*); Stephen W. James (*Cranfield University, United Kingdom*); Ralph P. Tatam (*Cranfield University, United Kingdom*)

Tactile Sensors using the distributed optical fibre sensors486

Jin-Seok Heo (*Samsung Electronics Semiconductor Business, Korea*); Ju-Young Kim (*Korea Advanced Institute of Science and Technology, Korea*); Jung-Ju Lee (*Korea Advanced Institute of Science and Technology, Korea*)

S16: Temperature Sensors

An Inherently Linear Transducer using Thermistor Practical Approach491

Valter C Rosa (*Federal University of Bahia, Brazil*); Lígia Souza Palma (*Federal University of Bahia, Brazil*); Amauri Oliveira (*Federal University of Bahia, Brazil*); Tiago Rodrigues Torres (*Federal University of Bahia, Brazil*)

A CMOS Temperature Sensor with Calibration Function using Band Gap Voltage Reference496

Dong-Ok Han (*Samsung Electro-Mechanics, Korea*); Yong-II Kwon (*Samsung Electro-Mechanics, Korea*); Tah-Joon Park (*Samsung Electro-Mechanics, Korea*); Heon-Chul Park (*Samsung Electro-Mechanics, Korea*)

Infrared Fiber-optic Sensor for Non-contact Temperature Measurements500

Wook Jae Yoo (*Konkuk University, Korea*); Dong Hyun Cho (*Konkuk University, Korea*); Kyoung Won Jang (*Konkuk University, Korea*); Sang Hun Shin (*Konkuk University, Korea*); Jeong Ki Seo (*Konkuk University, Korea*); Soon-Cheol Chung (*Konkuk University, Korea*); Gye-Rae Tack (*Konkuk University, Korea*); Bongsoo Lee (*Konkuk University, Korea*); Byung Gi Park (*Soonchunhyang University, Korea*); Joo Hyun Moon (*Dongguk University, Korea*); Sin Kim (*Cheju National University, Korea*)

S17: Mechanical Sensors

Flexible Piezoelectric Tactile Sensor with Structural Electrodes Array for Shape Recognition System.....504

Cheng-Hsin Chuang (Southern Taiwan University, Taiwan); Wen-Bin Dong (Southern Taiwan University, Taiwan); Wen-Bin Lo (Southern Taiwan University, Taiwan)

Sizing of Back-Surface Flaws by Piezoelectric Highpolymer Film508

Akinobu Yamamoto (Kyoto University, Japan); Shiro Biwa (Kyoto University, Japan); Eiji Matsumoto (Kyoto University, Japan)

Making a simple structured large load force sensor514

Hiroyuki Wakiwaka (Shinshu University, Japan); Ryosuke Kobayashi (Shinshu University, Japan); Kunihisa Tashiro (Shinshu University, Japan); Yuya Nakamoto (Shinshu University, Japan); Tsuyoshi Kawata (Shinshu University, Japan)

A new method to detect zero drift and sensitivity of a Coriolis Mass Flow Meter (CMFM) by using phasor control518

H. Röck (Christian-Albrechts-University of Kiel, Germany); F. Koschmieder (Christian-Albrechts-University of Kiel, Germany)

S18: Sensors for Health Monitoring

Adaptive Reduction of Motion Artefact in Wireless Physiological Monitoring Microsystems523

Yi-Shiang Ou Yang (Industrial Technology Research Institute, Taiwan); Wen-Ching Lee (Industrial Technology Research Institute, Taiwan); Ting-Chen Ke (Industrial Technology Research Institute, Taiwan); Chia-Ping Wei (Industrial Technology Research Institute, Taiwan); Chin-Cheng Lee (Industrial Technology Research Institute, Taiwan)

OSGi-Based Smart Home Architecture for Heterogeneous Network527

Red-Tom Lin (Institute for Information Industry, Taiwan); Chin-Shun Hsu (Institute for Information Industry, Taiwan); Tee Yuen Chun (National Cheng Kung University, Taiwan); Sheng-Tzong Cheng (National Cheng Kung University)

Wireless Sensors Networks Based Monitoring: Review, Challenges and Implementation Issues533

A. Gaddam (Massey University, New Zealand); S.C. Mukhopadhyay (Massey University, New Zealand); G. Sen Gupta (Massey University, New Zealand); H. Guesgen (Massey University, New Zealand)

An automatic pulse wave velocity estimation using a blood pressure sensor for invasive measurement539

Junghyeon Choi (Inje University, Korea); Junho Park (Inje University, Korea); Jongman Cho (Inje University, Korea)

S19: Thin/Thick Film Sensors

Piezoelectric Zinc Oxide Thin Film for MEMS Application: A Comparative Study543

Nikhil Gokhale (Indian Institute of Science, India); Mitesh Parmar (Indian Institute of Science, India); K. Rajanna (Indian Institute of Science, India); M.M. Nayak (Semi-conductor Laboratory, India)

Effect of Nano Ag on Gas Sensing Performance of ZnO Thick Films547

M.K. Deore (Arts, Commerce and Science College, India); V.B. Gaikwad (K.T.H.M. College, India); G.H. Jain (Arts, Commerce and Science College, India); P.K. Khanna (C-MET, India)

Enhanced oxygen adsorption activity by CuO catalyst clusters on SnO₂ thin film based sensors553

Arjit Chowdhuri (University of Delhi, India); Divya Haridas (University of Delhi, India); K. Sreenivas (University of Delhi, India); Vinay Gupta (University of Delhi, India)

Parasitic resistance elimination for the flexibly thin film grid pressure sensor	557
<i>Zhou Gaofeng (Xi'an Jiaotong University, P.R. China); Zhao Yulong (Xi'an Jiaotong University, P.R. China); Jiang Zhuangde (Xi'an Jiaotong University, P.R. China)</i>	

S20: Sensors for Robotic Applications and Object Detection

Detecting Re-entry of a moving object in an irregular space	563
<i>Chandan Kr. Bhattacharyya (West Bengal University of Technology, India); Swapna Bhattacharya (Jadavpur University, India)</i>	
Robot Consciousness and Representation of Facial Expressions	569
<i>Junichi Takeno (Meiji University Graduate School, Japan); Kentaro Mori (Meiji University Graduate School, Japan); Yuta Naito (Meiji University Graduate School, Japan)</i>	
Design of a web-enabled anthropomorphic robotic arm for teleoperation	575
<i>G. Sen Gupta (Massey University, New Zealand), S.C. Mukhopadhyay (Massey University, New Zealand), Matthew Finnie (Massey University, New Zealand)</i>	
A Crowd-Filter for Detection of Abandoned Objects in Crowded Area	581
<i>Chuan-Yu Cho (National Tsing Hua University, Taiwan); Wei-Hao Tung (National Tsing Hua University, Taiwan); Jia-Shung Wang (National Tsing Hua University, Taiwan)</i>	

S21: Algorithm for Sensor Technology

Source Localization Using a Maximum Likelihood/Semidefinite Programming Hybrid	585
<i>Stella-Rita C. Ibeawuchi (University of Iowa, USA); Soura Dasgupta (The University of Iowa, USA); Cheng Meng (University of California, Davis, USA); Zhi Ding (University of California, Davis, USA)</i>	
GPS Navigation Processing Using the IMM-Based EKF	589
<i>Dah-Jing Jwo (National Taiwan Ocean University, Taiwan); Chien-Hao Tseng (National Taiwan Ocean University, Taiwan)</i>	
An Experimental Result on System Identification over Networks using Delta-Sigma Transformation	595
<i>Takehito Azuma (Utsuminiya University, Japan); Hirohisa Kato (Utsuminiya University, Japan); Shuichi Adachi (Keio University, Japan)</i>	
Reliable Grouping GAF Algorithm using Hexagonal Virtual Cell Structure	600
<i>Chuan-Yu Cho (National Tsing Hua University, Taiwan); Cheng-Wei Lin (National Tsing Hua University, Taiwan); Jia-Shung Wang (National Tsing Hua University, Taiwan)</i>	

S22: Chemical Sensors

Analytical Models of Resonant Rectangular Cantilever Type Chemical Sensors for Applications in Fluids	604
<i>Siripon Sukuabol (RMIT University, Australia); Dinesh K. Sood (RMIT University, Australia)</i>	
Study of Surface-modified Lipid/polymer Membranes for Detecting Sweet Taste Substances	610
<i>Hong Cui (Kyushu University, Japan); Masaaki Habara (Kyushu University, Japan); Hidekazu Ikezaki (Intelligent Sensor Technology, Inc., Japan); Kiyoshi Toko (Kyushu University, Japan)</i>	

Towards High Sensitive Label Free DNA Detection in Lab-on-Chip Systems.....615

W. Hoffmann (Karlsruhe Institute of Technology, Germany); H. Mühlberger (Karlsruhe Institute of Technology, Germany); W. Hwang (Karlsruhe Institute of Technology, Germany); H. Demattio (Karlsruhe Institute of Technology, Germany); A. Guber (Karlsruhe Institute of Technology, Germany); V. Saile (Karlsruhe Institute of Technology, Germany)

Electromagnetic Interaction of Planar Interdigital Sensors with Chemicals Contaminated in Seafood620

A.R. Mohd Syaifudin (Massey University, New Zealand); S.C. Mukhopadhyay (Massey University, New Zealand); K.P. Jayasundera (Massey University, New Zealand)

S24: Sensors for Bio-medical Applications**Photoacoustic Spectroscopy of Biomedical Gas Sensing: Adaptive Filtering as Calibration626**

A. Lay-Ekuakille (University of Salento, Italy); G. Vendramin (University of Salento, Italy); A. Trotta (Polytechnic of Bari, Italy)

Development of gait phase analyzing devices for the gait training equipment for hemiplegia patients632

Junho Park (Inje University, Korea); Junghyeon Choi (Inje University, Korea); Jongman Cho (Inje University, Korea)

Electrical Detection of very low content of transferrin in view of iron metabolism characterization637

A. Girard (University Rennes 1, France); O. De Sagazan (University Rennes 1, France); F. Le Bihan (University Rennes 1, France); T. Mohammed-Brahim (University Rennes 1, France); F. Geneste (University Rennes 1, France); P. Brissot (University Rennes 1, France); C. Guguen-Guilhouzo (University Rennes 1, France)

Magnetic Fluid Weight Density Estimation in Large Cavities by a Needle-type GMR Sensor ..642

C.P. Gooneratne (Kanazawa University, Japan); M. Iwahara (Kanazawa University, Japan); M. Kakikawa (Kanazawa University, Japan); S. Yamada (Kanazawa University, Japan); A. Kurnicki (Lublin University of Technology, Poland); S.C. Mukhopadhyay (Massey University, New Zealand)

S25: Moisture Sensors**Porosity modification for the adjustment of the dynamic range of ceramic humidity sensors648**

Faramarz Hossein-Babaei (K.N. Toosi University of Technology, Iran); Saeedeh Rahbarpour (K.N. Toosi University of Technology, Iran)

Influence of Alkyl Chain Length of Lipid in Caffeine Detection Using Taste Sensor with Lipid/Polymer Membranes652

H.F. Shen (Kyushu University Japan, Japan); M. Habara (Kyushu University, Japan); K. Toko (Kyushu University, Japan)

Study of Cross- Sensitivity of Porous Alumina based Trace Moisture Sensor in Dry Gases ...656

S. Dhanekar (Jamia Millia Islamia (Central University), India); P.M.Z. Hasan (Jamia Millia Islamia (Central University), India); S. Hussain (Jamia Millia Islamia (Central University), India); T. Islam (Jamia Millia Islamia (Central University), India); S.S. Islam (Jamia Millia Islamia (Central University), India); K. Sengupta (Central Glass and Ceramic Research Institute, India); Deb. Saha (Central Glass and Ceramic Research Institute, India)

Investigation on the Dependency of the Electrical Capacitance on the Moisture Content of Wood Pellets	661
<i>Anton Fuchs (Graz University of Technology, Austria); Michael J. Moser (Graz University of Technology, Austria); Hubert Zangl (Graz University of Technology, Austria)</i>	

S26: Nano-Sensors

Deposition of SiO₂/Polymer Nanoporous Thin Films on Long-Period Grating (LPG) Optical Fibres and Dramatic Enhancement of the Resonance Bands	666
<i>Sergiy Korposh (The University of Kitakyushu, Japan); Suguru Kodaira (The University of Kitakyushu, Japan); Seung-Woo Lee (The University of Kitakyushu, Japan); William J. Batty (Cranfield University at Kitakyushu, Japan); Stephen W. James (Cranfield University, United Kingdom); Ralph P. Tatam (Cranfield University, United Kingdom)</i>	
Synthesis of Aligned Zinc Oxide Nanorods for Humidity Sensing	670
<i>Yun Wang (University of Waterloo, Canada); John T.W. Yeow (University of Waterloo, Canada); Liang-Yih Chen (National Taiwan University of Science and Technology, Taiwan)</i>	
Detection and Discrimination of Alcohol Vapours Using Single-step Anodised Nanoporous Alumina Sensors	674
<i>Martin Kocanda (Northern Illinois University, USA); Michael Haji-Sheikh (Northern Illinois University, USA); David S. Ballantine (Northern Illinois University, USA)</i>	

Author Index