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Yong-Lae Park¹, Robert Wood²
¹Carnegie Mellon University, United States; ²Harvard University, United States

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Chinese Academy of Sciences, China

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Yi Feng¹, Li Xie¹, Matti Mäntysalo², Qiang Chen¹, Li-Rong Zheng^{1,3}

¹Royal Institute of Technology, Sweden; ²Tampere University of Technology, Finland; ³State Key Lab of ASICs and Systems, ICT School, China

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¹Fraunhofer IPMS, Germany; ²Technische Universität Dresden, Germany

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¹Namlab GmbH, Germany; ²Technische Universität Dresden, Germany

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¹Johannes Kepler University, Austria; ²Vienna University of Technology, Austria

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¹Oklahoma State University, United States; ²University of Texas at Dallas, United States

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¹*Sotera Defense Solutions, Inc., United States;* ²*US Naval Research Laboratory, United States*

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¹*Forschungszentrum Jülich GmbH, Germany;* ²*University of Bonn, Germany*

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¹Analog Devices, Ireland; ²Seiche Ltd, United Kingdom; ³University of Limerick, Ireland

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¹Fraunhofer FHR, Germany; ²Ruhr-University Bochum, Germany

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¹Korea Research Institute of Chemical Engineering, Korea, South; ²Tottori University, Japan

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Christopher Carron¹, Patrick Getz¹, Jin-Jyh Su¹, David Gottfried¹, Oliver Brand¹, Fabien Josse², Stephen Heinrich²
¹Georgia Institute of Technology, United States; ²Marquette University, United States

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Fatima-Ezahra Annanouch², Eduard Llobet², Russell Binions¹
¹Queen Mary, University of London, United Kingdom; ²Universitat Rovira I Virgili, Spain

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¹DST/CSIR National Centre for Nano-Structured Materials, South Africa; ²University of South Africa, South Africa; ³University of Cologne, Germany; ⁴University of Malawi – The Polytechnic

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¹Instituto de Microelectronica de Sevilla, CSIC, Spain; ²Universidad de Sevilla

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¹Kyoto Institute of Technology, Japan; ²Niigata University, Japan

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Tse-Yi Tu², Paul C.-P. Chao², Yung-Pin Lee¹
¹MedSense Inc., Taiwan; ²National Chaio Tung University, Taiwan

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¹University of Freiburg, Germany; ²University of Ulm, Germany

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¹Assiut University, Egypt; ²Imec, Belgium; ³CENA, Belgium

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Illinois Institute of Technology, United States

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¹National Institute of Advanced Industrial Science and Technology, Japan; ²NMEMS Technology Research Organization, Japan

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¹University of Southampton, United Kingdom; ²University of Sussex, United Kingdom

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¹ETH Zürich, Switzerland; ²RIKEN, Japan

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¹Technische Universität Dresden, Germany; ²University of Auckland, New Zealand

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¹ITEFI-CSIC, Spain; ²IMIDRA, Spain

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¹National Institute of Standards and Technology, United States; ²University of Maryland, United States

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¹Cambridge CMOS Sensors Ltd, United Kingdom; ²University of Cambridge, United Kingdom; ³Kyung Hee University, United Kingdom; ⁴University of Warwick, United Kingdom

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¹*City College of New York, United States;* ²*International Islamic University Malaysia, Malaysia;* ³*New York Institute of Technology, United States*

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¹*Tokyo Medical and Dental University, Japan;* ²*Tokyo National College of Technology, Japan;* ³*Tokyo University of Marine Science and Technology, Japan*

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¹*Korea Institute of Science and Technology, Korea, South;* ²*Kyung Hee University, Korea, South;* ³*Seoul National University, Korea, South;* ⁴*Sogang University, Korea, South*

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¹Argonne National Laboratory, United States; ²University of South Florida, United States

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Hokkaido University, Japan

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B3P-J: PIEZOELECTRIC, TACTILE & PRESSURE SENSORS

Poster Area - Baltimore AB

Session Chairs: Christian Zorman, Libor Rufer

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¹ Indian Institute of Technology Delhi, India; ² University of Maryland, United States	
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¹ Niigata University, Japan; ² Nitta Corporation, Japan; ³ Osaka University, Japan; ⁴ Ritsumeikan University, Japan	
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Poster Area - Baltimore AB

Session Chairs: Svetlana Tatic-Lucic, Srinivas Tadigadapa

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¹Delaware State University, United States; ²University of Texas at Arlington, United States
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¹Masdar Institute of Science and Technology, U.A.E.; ²Massachusetts Institute of Technology, United States;
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¹European Organization for Nuclear Research (CERN), Switzerland; ²Universita degli Studi del Sannio, Italy

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¹Argonne National Laboratory, United States; ²University of Illinois at Chicago, United States; ³University of South Florida, United States

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Indian Institute of Technology, India

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Abdelhameed Sharaf^{1,2}, Asmaa Gamal¹, Mohamed Serry¹
¹The American University in Cairo, Egypt; ²NCRRT, Egyptian Atomic Energy Authority, Egypt

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Poster Area - Baltimore AB

Session Chair: Elliott Brown

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University of Bremen, Germany

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¹AUDI AG, Germany; ²Technische Universität Braunschweig, Germany; ³Technische Universität München, Germany

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Nanjing University of Science and Technology, China

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¹Catholic University Asuncion, Paraguay

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¹Isfahan University of Technology, Iran; ²Mississippi State University, United States

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University of L'Aquila, Italy

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Poster Area - Baltimore AB

Session Chair: David Horsley

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Louisiana Tech University, United States

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¹Mie University, Japan; ²RIKEN, Japan

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¹Centre Hospitalier Universitaire, France; ²Université de Bourgogne, France

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Luke Osborn², Nitish Thakor², Rahul Kaliki¹
¹Infinite Biomedical Technologies, United States; ²Johns Hopkins University, United States

A NOVEL WIRELESS MOTION SENSOR FOR ANALYZING GOLF SWING 1270

Zhijian Yin², Haojie Ning², Yoshio Inoue³, Meimei Han¹, Tao Liu^{2,3}
¹INSENCO R&D Lab. Inc., Japan; ²Jiangxi Science & Technology Normal University, Japan; ³Kochi University of Technology, Japan;

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B3P-N: OPEN POSTER I

Poster Area - Baltimore AB

Session Chair: Troy Nagle

REMOTE IDENTIFICATION AND WIRELESS TEMPERATURE SENSING BASED ON UWB PASSIVE CHIPLESS TIME-CODED RFID TAGS WITH LOS AND NLOS SCENARIOSB#

Mina Wahib¹, Martin Schüßler², Bernd Kubina², Rolf Jakoby²
¹German University in Cairo, Egypt, Egypt; ²Technical University of Darmstadt, Germany

A WEARABLE SYSTEM FOR NON-INVASIVE BEAT-TO-BEAT BLOOD PRESSURE ESTIMATIONSB#

Marcus Pietzsch¹, Martin Zimmerling¹, Wolf-Joachim Fischer²
¹Fraunhofer IPMS, Germany; ²TU Dresden, Germany

NON-INVASIVE ASSESSMENT OF SKIN HYDRATIONB#

Jose Abraham
Kimberly Clark Corporation, United States

EMBEDDED DAQ SYSTEM FOR SENSOR EVALUATION AND MOBILE AUTARKIC APPLICATIONS IN RESEARCH AND EDUCATIONB#

Roger Heil, Mario Schlösser, Stefan van Waasen, Michael Schiek
ZEA-2, Germany

PH SENSOR BASED ON LOW-LIGHT FLUORESCENCE DETECTION FOR DIAGNOSIS OF GASTROESOPHAGEAL REFLUX DISEASEB#

Paul Mintchev, Raymond Turner, Orly Yadid-Pecht
University of Calgary, Canada

USING MACHINE OLFACTION TO ASSIST HUMAN ODOR PANELSB#

Susan Schiffman, Troy Nagle
North Carolina State University, United States

MOS TUNNELING CURRENT SENSING FOR RESONANT SENSORSB#

Li Zhu, Bryan Snatchko, Shamus McNamara
University of Louisville, United States

A NON-INVASIVE ACTIVE DRY ELECTRODE FOR WIRELESS HUMAN-TO-COMPUTER INTERFACINGB#

Jeong A Lee¹, Olufemi Adeluyi¹, Kiseon Kim²
¹Chosun University, Nigeria; ²GIST, Korea, South

MONITORING YOUTH SOCCER PLAYER PERFORMANCE TO REDUCE INJURY AND OPTIMA SUBSTITUTION STRATEGIESB#

Phil Attah-Okine¹, Yaw Adu-Gyamfi²
¹Archmere Academy, United States; ²University of Virginia, United States

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B4L-A: CARBON NANOTUBES & GRAPHENE

Maryland F

Session Chairs: EH Yang, Joan Hoffmann

3:30 PM

INVITED TALK: ULTRANANOCRYSTALLINE DIAMOND: NEW OPPORTUNITIES FOR THE FABRICATION OF NOVEL SENSORS..... 1274

Anirudha V. Sumant

Argonne National Laboratory, United States

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Thomas Charisoulis², Abbas Jamshidi-Roudbari², Nack-Bong Choi², Miltos Hatalis², Yijiang Lu¹, Jing Li¹

¹NASA Ames Research Center, United States; ²Lehigh University, United States

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PT-FUNCTIONALIZED GRAPHENE/SI HETEROSTRUCTURE FOR HYDROGEN SENSING 1279

Ahsan Uddin, Amol Singh, Tangali Sudarshan, Goutam Koley

University of South Carolina, United States

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GAS SENSING BY GRAPHENE/SILICON HETROSTRUCTURE 1283

Amol Singh, Ahsan Uddin, Tangali Sudarshan, Goutam Koley

University of South Carolina, United States

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TUNABLE GRAPHENE/INDIUM NITRIDE HETEROSTRUCTURE DIODE SENSOR 1287

Alina Wilson², Ifat Jahangir², Amol Singh², Nick Sbrockey¹, Elane Coleman¹, Gary Tompa¹, Goutam Koley²

¹Structured Materials Industries, Inc., United States; ²University of South Carolina, United States

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B4L-B: INTEGRATION

Maryland E

Session Chairs: Hongrui Jiang, Babak Ziaie

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INVITED TALK: CARBON-NANOTUBE BASED FLEXIBLE ELECTRODES FOR RETINAL RECORDING AND STIMULATION 1291

Moshe David-Pur, Lilach Bareket-Keren, Giora Beit-Yaakov, Dorit Raz-Prag, David Rand, Yael Hanein

Tel-Aviv University, Israel

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Arizona State University, United States

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FABRICATION OF MICRODEVICES FOR SEPARATION OF CIRCULATING TUMOR CELL USING LATERAL MAGNETOPHORESIS AND IMMUNOMAGNETIC NANOBEADS 1299

Dae-Sik Lee, Jeong Won Park, Nae-Lim Lee, Mun Yeon Jung, Sung-Mok Cho

Electronics Telecommunications Research Institute (ETRI), Korea, South

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A LOW POWER AUTO-RECONFIGURABLE PIPELINED ADC FOR IMPLANTABLE BIOMEDICAL APPLICATIONS 1303

Terence Randall, Ifana Mahbub, Syed Kamrul Islam
University of Tennessee, Knoxville, United States

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A NEW GAS SENSOR OF A THIN-FILM DIODE AND LOW-POWER, AREA-EFFICIENT READOUT CIRCUIT 1307

Hung-Che Chen, Paul C.-P. Chao, Wei-Chu Lin, Hsiang-Fang Sun, Ming-Zhi Dai, Hsiao-Wen Zan
National Chiao Tung University, Taiwan

3:30 PM - 5:00 PM

B4L-C: PRESSURE SENSORS

Maryland A

Session Chairs: Bernhard Jakoby, Paddy French

3:30 PM

A WIRELESS PRESSURE SENSOR BASED ON SURFACE TRAPPED FERROFLUID PLUG 1311

Albert Kim, Babak Ziaie, Girish Chitnis
Purdue University, United States

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A MONOCRYSTALLINE ABSOLUTE PRESSURE SENSOR WITH A PSEUDO-MOSFET READ-OUT DEVICE FOR LIFE-SCIENCE APPLICATIONS 1315

Sven Ebschke, Remigius Poloczek, Klaus Kallis, Horst Fiedler
TU Dortmund, Germany

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DISTRIBUTED PIEZOELECTRIC THIN FILM SENSOR ARRAY FOR MONITORING IMPACT EVENTS 1319

Sudeep Joshi, Manjunath M Nayak, Konandur Rajanna
Indian Institute of Science, India

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WEARABLE AND FLEXIBLE PEDOBAROGRAPHIC INSOLE FOR CONTINUOUS PRESSURE MONITORING 1323

Stefano Stassi^{1,2}, Giancarlo Canavese¹, Valentina Cauda¹, Carmelo Fallauto², Simone Corbellini², Paolo Motto², Danilo Demarchi¹, Candido Fabrizio Pirri^{1,2}
¹*Istituto Italiano di Tecnologia, Italy;* ²*Politecnico di Torino, Italy*

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ALL-ELASTOMER IN-PLANE MEMS CAPACITIVE TACTILE SENSOR FOR NORMAL FORCE DETECTION 1327

Alexi Charalambides, Sarah Bergbreiter
University of Maryland, United States

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B4L-D: INERTIAL SYSTEMS MODELING

Maryland D

Session Chair: Qing-An Huang

3:30 PM

EFFECTS OF IMPERFECTIONS ON SOLID-WAVE GYROSCOPE DYNAMICS 1331

Erdal Yilmaz, David Bindel
Cornell University, United States

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ADVANCED METHODS FOR CALCULATING QUADRATURE ERRORS OF MEMS GYROSCOPES 1335

Steven Kehrberg², Markus Dorwarth², Markus Heitz², Carsten Geckeler², Jan Mehner¹

¹Chemnitz University of Technology, Germany; ²Robert Bosch GmbH, Germany

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EUTECTIC TRIMMING OF POLYSILICON MICRO HEMISPHERICAL RESONATING GYROSCOPE 1339

Benoit Hamelin, Vahid Tavassoli, Farrokh Ayazi

Georgia Institute of Technology, United States

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AN IN-SITU MEASUREMENT METHOD FOR THERMALLY INDUCED PACKAGING STRESS IN DISTRIBUTED RF MEMS PHASE SHIFTERS 1343

Cheng Zhao, Jing Song, Lifeng Wang, Lei Han, Qing-An Huang

Southeast University, China

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IMPACT OF MECHANICAL STRESS ON BIPOLAR TRANSISTOR CURRENT GAIN AND EARLY VOLTAGE 1347

Richard Jaeger, Safina Hussain, Jeffrey Suhling, Parameshwaran Gnanachchelvi, Bogdan Wilamowski, Michael Hamilton

Auburn University, United States

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A PERFECT ELECTROSTATIC ANTI-SPRING 1351

Shai Shmulevich, Inbar Hotzen, David Elata

Technion - Israel Institute of Technology, Israel

3:30 PM - 5:00 PM

B4L-E: WIRELESS SENSOR NETWORKS FOR ENVIRONMENTAL MONITORING

Watertable ABC

Session Chair: Hong Yu

3:30 PM

QUANTIFYING SPATIAL DISTRIBUTION OF SOIL MOISTURE USING A COSMIC RAY AND CAPACITANCE SENSOR NETWORK..... 1355

Auro Almeida¹, Craig Baillie¹, Dale Worledge¹, Philip Smethurst¹, Ritaban Dutta¹, Andrew Terhorst¹, Trenton Franz²

¹Commonwealth Scientific and Industrial Research Organisation (CSIRO), Australia; ²University of Arizona, United States

3:45 PM

BACKSCATTER SENSOR NETWORK FOR EXTENDED RANGES AND LOW COST WITH FREQUENCY MODULATORS: APPLICATION ON WIRELESS HUMIDITY SENSING 1358

Eleftherios Kampianakis, John Kimionis, Konstantinos Tountas, Christos Konstantopoulos, Eftichios Koutroulis, Aggelos Bletsas

Technical University of Crete, Greece

4:00 PM

QUAD-TREE APPROACH FOR OBSTACLE DISCOVERY AND TRACKING IN WIRELESS SENSOR NETWORKS 1362

Prasenjit Chanak, Tuhina Samanta, Indrajit Banerjee

Bengal Engineering and Science University, Shibpur, India

4:15 PM

DETECTION OF TARGETS USING DISTRIBUTED MULTI-MODAL SENSORS WITH CORRELATED OBSERVATIONS 1366

Thyagaraju Damarla², Asif Mehmood¹

¹Booz Allen Hamilton, United States; ²US Army Research Laboratory, United States

4:30 PM

ACCURATE AND EARLY DETECTION OF LOCALIZED HEAVY RAIN BY INTEGRATING MULTIVENDOR SENSORS IN VARIOUS INSTALLATION ENVIRONMENTS 1370

Kei Hiroi¹, Yoshihito Seto², Futoshi Matsumoto², Yuzo Taenaka³, Hideya Ochiai⁴, Haruo Ando², Hitoshi Yokoyama², Masaya Nakayama³, Hideki Sunahara¹

¹Keio University, Japan; ²Tokyo Metropolitan Research Institute for Environmental Protection, Japan; ³University of Tokyo, Japan; ⁴VLSI Design and Education Center, University of Tokyo, Japan

4:45 PM

STRUCTURAL DAMAGE DETECTION OF NUCLEAR REACTOR SITES USING SENSOR NETWORKS 1374

Sainath Chidambar Munavalli, Niki Pissinou, Leonel Lagos, Xinyu Jin

Florida International University, United States

3:30 PM - 5:00 PM

B4L-F: MEDICAL APPLICATIONS

Homeland

Session Chair: Elfed Lewis

3:30 PM

AN EMG BIOFEEDBACK DEVICE FOR VIDEO GAME USE IN FOREARM PHYSIOTHERAPY 1378

Hayes Converse, Teresa Ferraro, Daniel Jean, Laura Jones, Vikas Mendhiratta, Emily Naviasky, Mang Par, Thomas Rimlinger, Steven Southall, Jason Sprenkle, Pamela Abshire

University of Maryland, United States

3:45 PM

HALL-EFFECT MAGNETIC TRACKING DEVICE FOR MAGNETIC RESONANCE IMAGING 1382

Jean-Baptiste Schell, Loic Cuvillon, Daniel Gounot, Elodie Breton, Jean-Baptiste Kammerer, Luc Hébrard, Michel de Mathelin

Université de Strasbourg (CNRS), France

4:00 PM

BIOPSY ANALYSIS USING A QUADRUPLE INFRARED SENSOR 1386

Valeria Fioravanti², Emanuel Weber², Sander van Den Driesche², Michael Johannes Vellekoop², Daniela Pucciarelli¹, Heimo Breiteneder¹, Christine Hafner¹

¹Medical University of Vienna, Austria; ²University of Bremen, Germany

4:15 PM

QUANTIFICATION OF EDEMA IN HUMAN BRAIN TISSUE BY DETERMINATION OF ELECTROMAGNETIC PARAMETERS 1390

Tobias Reinecke², Lars Hagemeyer¹, Verena Schulte², Michael Klintschar¹, Stefan Zimmermann²

¹Hannover Medical School, Germany; ²Leibniz University Hannover, Germany

4:30 PM

CHARACTERISATION OF RADIOLUMINESCENCE BASED OPTICAL FIBRE DOSIMETER IN RADIOTHERAPY BEAM APPLICATIONS 1394

Peter Woulfe^{2,3}, Sinead O'Keeffe³, Denis McCarthy³, Mark Grattan¹, Alan Hounsell¹, John Cronin², Elfed Lewis³

¹Belfast City Hospital, United Kingdom; ²Galway Clinic, Ireland; ³University of Limerick, Ireland

4:45 PM

IDENTIFICATION OF DIFFERENT RESPIRATORY RATE BY A PIEZO POLYMER BASED NASAL SENSOR.....

1398

Roopa G. Manjunatha, N. Ranjith, Y.V. Meghashree, Konandur Rajanna, D. Roy Mahapatra
Indian Institute of Science, India

WEDNESDAY, NOVEMBER 6TH

8:00 AM - 9:00 AM

PLENARY – KEYNOTE – DR. KENNETH S. JOHNSON: BIOARGO: A GLOBAL SCALE CHEMICAL SENSOR NETWORK TO OBSERVE CARBON, OXYGEN, AND NITROGEN CYCLES IN THE OCEAN

Maryland BC

Session Chair: Yogesh Gianchandani

8:00 AM

BIOARGO: A GLOBAL SCALE CHEMICAL SENSOR NETWORK TO OBSERVE CARBON, OXYGEN, AND NITROGEN CYCLES IN THE OCEAN..... 1402

Kenneth S. Johnson

Monterey Bay Aquarium Research Institute, United States

9:00 AM - 10:15 AM

C1L-A: ELECTROCHEMICAL SENSORS

Maryland F

Session Chairs: Joannis Raptis, Babak Ziaie

9:00 AM

ACOUSTIC TWEEZERS: MANIPULATING PARTICLES, CELLS, AND ORGANISMS USING STANDING SURFACE ACOUSTIC WAVES (SSAW)B#5

Tony Jun Huang

Pennsylvania State University, United States

9:30 AM

MICROSTRUCTURING CONDUCTING POLYMERS AND MOLECULARLY IMPRINTED POLYMERS BY LIGHT-ACTIVATED ELECTROPOLYMERIZATION ON MICROMACHINED SILICON. APPLICATIONS IN ELECTROCHEMICAL SENSING 1404

Elisabetta Mazzotta¹, Cosimino Malitesta¹, Salvo Surdo², Giuseppe Barillaro²

¹*Università del Salento, Italy;* ²*Università di Pisa, Italy*

9:45 AM

SCALE-DOWN EFFECTS: TOWARDS MINIATURIZATION OF AN ELECTROCHEMICAL SENSOR USING BIOMOLECULES 1408

Faheng Zang, Xiao Zhu Fan, Konstantinos Gerasopoulos, Hadar Ben-Yoav, Adam Brown, James Culver, Reza Ghodssi

University of Maryland, United States

10:00 AM

ULTRA-HIGH SCANNING SPEED CHEMICAL IMAGE SENSOR BASED ON LIGHT ADDRESSABLE POTENTIOMETRIC SENSOR WITH ANALOG MICRO-MIRROR 1412

Anirban Das, Tsung-Cheng Chen, Yi-Ting Lin, Chao-Sung Lai, Yuan-Hui Liao, Chia-Ming Yang

Chang Gung University, Taiwan

9:00 AM - 10:15 AM

C1L-B: POWER APPLICATIONS

Maryland E

Session Chairs: Mitsuhiro Shikida, Ruby Ghosh

9:00 AM

DEVELOPMENT OF A THIN-FILM THERMOCOUPLE MATRIX FOR IN-SITU TEMPERATURE MEASUREMENT IN A LITHIUM ION POUCH CELL..... 1416

Nora Martiny², Jan Geder², Yuxi Wang², Werner Kraus¹, Andreas Jossen¹

¹Technical University of Munich, Germany; ²TUM CREATE, Singapore

9:15 AM

A FLUIDIC MICROENERGY GENERATOR ENABLED BY HYBRID NANOMATERIAL NANOFUIDS..... 1420

Yuan He, Shiva Vasiraju, Long Que

Louisiana Tech University, United States

9:30 AM

ACHIEVING MAXIMUM POWER EFFICIENCY OF A NOVEL RECTIFIER CHARGE PUMP BY IMPEDANCE MATCHING IN AN ENERGY HARVESTER SUITED FOR SELF-POWERED SENSORS 1424

Paul C.-P. Chao, Chao-Te Chiang, Tzu-Chia Huang, Chun-Kai Chang

National Chiao Tung University, Taiwan

9:45 AM

HIGH-VOLTAGE GENERATION USING A CMOS IMAGE SENSOR WITH DUAL PHOTO-SENSING AND ENERGY HARVESTING CAPABILITIES 1428

Hsuan-Tsung Wang², Walter Leon-Salas¹

¹Purdue University, United States; ²University of Missouri-Kansas City, United States

10:00 AM

A SELF-POWERED PHOTODIODE SWITCH DETECTS ONLY RISING EDGE OF INFRARED-LIGHT PULSE FOR WIRELESS ZERO-STANDBY-POWER WAKE-UP RECEIVER 1432

Fumiyasu Utsunomiya, Ami Tanaka, Takakuni Douseki

Ritsumeikan University, Japan

9:00 AM - 10:15 AM

C1L-C: VISCOSITY, DENSITY AND FLOW SENSORS

Maryland A

Session Chair: Patrick Ruther

9:00 AM

EXPERIMENTAL AND THEORETICAL EVALUATION OF THE ACHIEVABLE ACCURACIES OF RESONATING VISCOSITY AND MASS DENSITY SENSORS 1436

Martin Heinisch, Thomas Voglhuber-Brunnmaier, Erwin K. Reichel, Bernhard Jakoby

Johannes Kepler University, Austria

9:15 AM

VISCOSITY AND DENSITY SENSOR PRINCIPLE BASED ON DIAMAGNETIC LEVITATION USING PYROLYTIC GRAPHITE 1440

Stefan Clara, Hannes Antlinger, Wolfgang Hilber, Bernhard Jakoby

Johannes Kepler University, Austria

9:30 AM

MODELING APPROACHES FOR ELECTRODYNAMICALLY DRIVEN VISCOSITY AND MASS DENSITY SENSORS OPERATED IN THE KHZ RANGE AND EXPERIMENTAL VERIFICATIONS..... 1444

Martin Heinisch, Thomas Voglhuber-Brunnmaier, Erwin K. Reichel, Bernhard Jakoby
Johannes Kepler University, Austria

9:45 AM

LOW PRESSURE SPHERICAL THERMAL ANEMOMETER FOR SPACE MISSIONS..... 1448

Lukasz Kowalski, Vicente Jiménez, Manuel Domínguez-Pumar, Sergi Gorreta, Santiago Silvestre, Luis Castañer
Universitat Politècnica de Catalunya (UPC), Spain

10:00 AM

A NEW METHOD FOR THE VELOCITY MEASUREMENT OF GAS-LIQUID TWO-PHASE FLOW..... 1452

Ying Zhou, Zhiyao Huang, Baoliang Wang, Haifeng Ji, Haiqing Li
ZheJiang University, China

9:00 AM - 10:15 AM

C1L-D: OPTICAL IMAGING SENSORS

Maryland D

Session Chairs: John X.J. Zhang, Michiel Vellekoop

9:00 AM

TRENDS IN SMALL-FORMAT INFRARED ARRAY SENSORS..... 1456

Masafumi Kimata
Ritsumeikan University, Japan

9:30 AM

A HIGH-SPEED POLAR-SYMMETRIC IMAGER FOR REAL-TIME CALIBRATION OF ROTATIONAL INERTIAL SENSORS..... 1460

Ben Johnson, Changhyuk Lee, Sriram Sivaramakrishnan, Al Molnar
Cornell University, United States

9:45 AM

A COMBINED TACTILE AND PROXIMITY SENSING EMPLOYING A COMPOUND-EYE CAMERA..... 1464

Kazuhiro Shimonomura, Hiroto Nakashima
Ritsumeikan University, Japan

10:00 AM

CMOS SENSOR FOR SUN TRACKING 1466

Hongyi Wang², Tao Luo¹, Hongjiang Song¹, Jennifer Blain Christen¹
¹Arizona State University, United States; ²Xi'an Jiaotong University, China

9:00 AM - 10:15 AM

C1L-E: WIRELESS SENSOR NETWORKS FOR TARGETS & OBJECTS

Watertable ABC

Session Chairs: Geoffrey Cranch, Tracie Severson

9:30 AM

ITERATIVE INTERFERENCE MANAGEMENT IN CODED PASSIVE WIRELESS SENSORS 1470

Ali Abedi², Kristen Zyck¹
¹University of Florida, United States; ²University of Maine, United States

9:45 AM
DISTRIBUTED MULTI-TARGET SEARCH AND TRACK ASSIGNMENT USING CONSENSUS-BASED COORDINATION..... 1474

Tracie Severson, Derek Paley
University of Maryland, United States

10:00 AM
TOWARDS A PERPETUAL WIRELESS SENSOR NODE..... 1478

Ariton Xhafa¹, Bradford Campbell², Srinath Hosur¹
¹Texas Instruments, Inc., United States; ²University of Michigan, United States

9:00 AM - 10:15 AM
C1L-F: MATERIALS & FABRICATION II
Homeland
Session Chairs: Tao Li, Eugene Hwang

9:00 AM
TITANIUM NITRIDE (TIN) AS A GATE MATERIAL IN BICMOS DEVICES FOR BIOMEDICAL IMPLANTS 1482

Nishant Lawand², Henk van Zeijl², Paddy French², Jeroen Briaire¹, Johan Frijns¹
¹Leiden University Medical Centre, Netherlands; ²Delft University of Technology, Netherlands

9:15 AM
A CMOS-COMPATIBLE METAMATERIAL TO ENHANCE THE FRONT TO BACK RADIATION RATIO IN TERAHERTZ ANTENNA FOR SENSING APPLICATION..... 1486

Giuseppe Fiorentino, Waqas Syed, Fabio Santagata, Marco Spirito, Gregory Pandraud, Andrea Neto, Pasqualina M. Sarro, Aurele J.L. Adam
Technische Universiteit Delft, Netherlands

9:30 AM
POLYCRYSTALLINE DIAMOND CIRCULAR RESONANT DIAPHRAGMS WITH LOW ONSET OF NONLINEAR RESPONSE 1490

Andrew Barnes, Christian Zorman
Case Western Reserve University, United States

9:45 AM
NOVEL IMPEDANCE MATCHING MATERIALS AND STRATEGIES FOR AIR-COUPLED PIEZOELECTRIC TRANSDUCERS 1494

Tomas Gómez Álvarez-Arenas, Luis Díez
Spanish National Research Council (CSIC), Spain

10:00 AM
DESIGN AND IMPLEMENTATION OF COLLAGEN-BASED CAPACITIVE RELATIVE HUMIDITY SENSORS 1498

Steven Shapardanis, Mathew Hudspeth, Tolga Kaya
Central Michigan University, United States

WEDNESDAY, NOVEMBER 6TH – POSTER SESSION

10:15 AM - 12:15 PM

C2P-G: CHEMICAL & GAS SENSORS V

Poster Area - Baltimore AB

Session Chairs: Giuseppe Barillaro, EH Yang

- N719-DYE SENSITIZED AMORPHOUS ZINC OXIDE FILMS FOR NO₂ DETECTION UNDER VISIBLE-LIGHT ILLUMINATION..... 1502**
Chao Zhang, Marjorie Olivier, Marc Debliquy
University of Mons, Belgium
- ODOR SPATIAL DISTRIBUTION VISUALIZED BY A FLUORESCENT IMAGING SENSOR 1506**
Chuanjun Liu, Ryohei Yokoyama, Seiichi Uchida, Koji Nakano, Kenshi Hayashi
Kyushu University, Japan
- GAS SENSING STUDIES OF AN N-N HETEROJUNCTION METAL OXIDE SEMICONDUCTOR SENSOR ARRAY BASED ON WO₃ AND ZNO COMPOSITES..... 1510**
Anupriya Naik², Ivan Parkin², Russell Binions¹
¹*Queen Mary University of London, United Kingdom;* ²*University College London, United Kingdom*
- INVESTIGATION OF SH-SAW SENSORS FOR TOXIC HEAVY METAL DETECTION..... 1514**
Zeinab Ramshani, Binu Baby Narakathu, Sepehr Emamian, Sai Guruva Reddy Avuthu, Massood Zandi Atashbar
Western Michigan University, United States
- TOWARDS THE REALIZATION OF A MEMS-BASED PHOTOACOUSTIC CHEMICAL SENSOR USING ULTRACOMPACT EC-QCL (SPRITEIR) 1518**
Ellen Holthoff, Logan Marcus, Paul Pellegrino
US Army Research Laboratory, United States
- DIELECTRIC POWDER CHARACTERIZATION BY RADIO FREQUENCY MEASUREMENTS TECHNIQUE FOR HYDROGEN SENSOR APPLICATIONS: APPLICATION TO IRON OXIDE..... 1522**
Naimi Boubekour, Hatem El Matbouly, Frederic Domingue
Université du Québec à Trois-Rivières, Canada
- FUNCTIONALIZED SINGLE ZNO-METAL JUNCTION AS A PH SENSOR..... 1526**
Paolo Motto², Valentina Cauda¹, Stefano Stassi², Giancarlo Canavese², Danilo Demarchi^{1,2}
¹*Istituto Italiano di Tecnologia, Italy;* ²*Politecnico di Torino, Italy*
- CALIBRATION OF SMALL RESISTIVE COMMERCIAL SENSORS TO MEASURE OZONE WITH THE INTERFERENCE OF TEMPERATURE AND HUMIDITY 1530**
Manuel Aleixandre¹, Maria Del Carmen Horrillo¹, Michel Gerboles², Laurent Spinelle²
¹*ITEFI-CSIC, Spain;* ²*Joint Research Centre, Italy*
- CU₂O BASED ELECTROCHEMICAL SENSOR FOR DIRECT GLUCOSE DETECTION 1534**
Petra Majzlikova¹, Jan Prasek, Jana Chomoucka¹, Jana Drbohlavova¹, Jan Pekarek¹, Radim Hrdy¹, Jaromir Hubalek¹, Libuse Trnkova²
¹*Brno University of Technology, Czech Republic;* ²*Masaryk University, Czech Republic*
- ATOMIC LAYER DEPOSITED TiO₂ THIN FILMS FOR ENVIRONMENTAL GAS SENSING..... 1538**
Steven Mills, Bongmook Lee, Veena Misra
North Carolina State University, United States

SELECTIVE MULTIMODAL GAS SENSING IN EPITAXIAL GRAPHENE BY FOURIER TRANSFORM INFRARED SPECTROSCOPY 1542

Shamaita Shetu, B. K. Daas, Kevin Daniels, Tangali Sudarshan, Goutam Koley, Mvs Chandrashekar
University of South Carolina, United States

POLYNUCLEOTIDE-FUNCTIONALIZED GOLD NANOPARTICLES AS CHEMIREISTIVE VAPOR SENSING ELEMENTS 1545

Kan Fu², Wyatt Pedrick², Han Wang², Andrew LaMarche², Xiaoqiang Jiang², Brian Willis², Shihui Li¹, Yong Wang¹
¹*Pennsylvania State University, United States;* ²*University of Connecticut, United States*

10:15 AM - 12:15 PM

C2P-H: APPLICATIONS II

Poster Area - Baltimore AB

Session Chair: David Horsley

A CMOS INTELLIGENT LIGHT SENSING CHIP FOR AUTOMATIC BRIGHTNESS TUNING APPLICATIONS 1549

Cheng-Ta Chiang, Jia-Yao Liou
National Chia Yi University, Taiwan

DUAL SIX-PORT BASED DIRECTION-OF-ARRIVAL DETECTOR FOR FMCW RADAR TRACKING IN THE ISM BAND AT 24 GHZ 1554

Gabor Vinci², Stefan Lindner¹, Sebastian Mann¹, Francesco Barbon¹, Robert Weigel¹, Alexander Koelpin¹
¹*University of Erlangen-Nuremberg Germany;* ²*InnoSenT GmbH, Germany*

A WIRELESS LASER SENSOR WEB FOR HUMAN GAIT DISORDER RECOGNITION BASED ON THE BUFFONS NEEDLE MODEL 1557

Rui Ma, Qi Hao
University of Alabama, United States

SUPERVISED MACHINE LEARNING SCHEME FOR TRI-AXIAL ACCELEROMETER-BASED FALL DETECTOR B#5

Alessandro Leone, Gabriele Rescio, Pietro Siciliano
CNR-Institute for Microelectronics and Microsystems, Italy

MOBILE APPLICATION BASED SUSTAINABLE IRRIGATION WATER USAGE DECISION SUPPORT SYSTEM: AN INTELLIGENT SENSOR CLOUD APPROACH 1565

Cecil Li¹, Ritaban Dutta¹, Corné Kloppers¹, Claire D'Este¹, Ahsan Morshed¹, Auro Almeida¹, Aruneema Das², Jagannath Aryal²
¹*Commonwealth Scientific and Industrial Research Organisation (CSIRO), Australia;* ²*University of Tasmania, Australia*

ROCK COLLAPSE FORECASTING: A NOVEL APPROACH BASED ON THE CLASSIFICATION OF MICRO-ACOUSTIC SIGNALS IN THE WAVELET DOMAIN 1569

Stavros Ntalampiras, Manuel Roveri
Politecnico di Milano, Italy

S³MD, STRESS SENSITIVE SURFACE MOUNTED DEVICES FOR IN-SITU MONITORING OF MECHANICAL PROCESSES IN PCB MANUFACTURING 1573

Soeren Majcherek, Soeren Hirsch, Bertram Schmidt
Otto-von-Guericke-University Magdeburg, Germany

SELF-POWERED WIRELESS DIGITAL TACHOMETER SCHEME WITHOUT SENSORS FOR MEASURING SPIN OF YO-YO 1577

Itaru Asakura, Ami Tanaka, Hisashi Nishikawa, Takakuni Douseki
Ritsumeikan University, Japan

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Jesús Lozano, José Ignacio Suárez, José Manuel Ordiales, Teodoro Aguilera <i>University of Extremadura, Spain</i>	
PARTICLE FILTERING TO IMPROVE THE DYNAMIC ACCURACY OF ELECTROMAGNETIC TRACKING	1586
Hasan Sen, Peter Kazanzides <i>Johns Hopkins University, United States</i>	
COMPARATIVE STUDY OF MOISTURE MEASUREMENTS BY TIME DOMAIN TRANSMISSOMETRY	1590
Bianca Will, Ilona Rolfes <i>Ruhr-University Bochum, Germany</i>	
WATER VELOCIMETER AND TURBIDITY-METER USING VISIBLE LIGHT COMMUNICATION MODULES	1594
Cheng-Chun Chang ² , Chien-Ta Wu ² , Yung-Bin Lin ¹ , Meng-Huang Gu ¹ ¹ <i>National Center for Research on Earthquake Engineering, Taiwan;</i> ² <i>National Taipei University of Technology, Taiwan</i>	
WEARABLE MULTI-SENSOR GESTURE RECOGNITION FOR PARALYSIS PATIENTS	1598
Alexander Nelson ² , Prashanth Shyamkumar ¹ , William Wilkins ¹ , David Lachut ² , Nilanjan Banerjee ² , Sami Rollins ³ , James Parkerson ¹ , Vijay Varadan ¹ ¹ <i>University of Arkansas, United States;</i> ² <i>University of Maryland, Baltimore County, United States;</i> ³ <i>University of San Francisco, United States</i>	
A WIRELESS-ENABLED SENSOR SYSTEM FOR DISTRIBUTED RADIATION DETECTION ON ANDROID CELLPHONES	1602
Yu Sui, Tao Li <i>University of Michigan, United States</i>	
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C2P-J: FLUIDIC AND MISCELLANEOUS SENSORS	
Poster Area - Baltimore AB	
Session Chair: Babak Ziaie	
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METALLIC AND CERAMIC THIN FILM THERMOCOUPLES FOR GAS TURBINE ENGINE APPLICATIONS	1606
Ian Tougas, Otto Gregory <i>University of Rhode Island, United States</i>	
AIRBORNE ULTRASONIC SENSOR NODE FOR DISTANCE MEASUREMENT	1610
Enrique A. Vargas Cabral, Isidro Valdez <i>Catholic University Asuncion, Paraguay</i>	
TEMPERATURE-COMPENSATED CATHETER FLOW SENSOR AND ITS APPLICATION TO BREATHING MEASUREMENT IN A MOUSE	1614
Takayuki Yamada, Yudai Yamazaki, Takuya Matsuyama, Mitsuhiro Shikida, Miyoko Matsushima, Tsutomu Kawabe <i>Nagoya University, Japan</i>	
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Stefan Clara, Hannes Antlinger, Wolfgang Hilber, Bernhard Jakoby <i>Johannes Kepler University, Austria</i>	

PROPOSAL OF SHEAR STRESS SENSOR BASED ON OPTICAL DETECTION 1622

Yuta Eto, Syunji Shibata, Mitsuhiro Shikida
Nagoya University, Japan

PARAMETRIC AMPLIFICATION IN A MICRO CORIOLIS MASS FLOW SENSOR: REDUCTION OF POWER DISSIPATION WITHOUT LOSS OF SENSITIVITY 1626

Jarno Groenesteijn, Harmen Droogendijk, Remco Wiegerink, Theo S. J Lammerink, Joost Lötters, Remco Sanders, Gijs J.M Krijnen
University of Twente, Netherlands

WIDE SPAN THERMAL WIND SENSOR SYSTEM WITH DUAL CHIPS 1630

Lin Zhou, Sheng-Qi Cheng, Tian-Yu Xiang, Ming Qin, Bei Chen, Qing-An Huang
Southeast University, China

A NEW SENSOR FOR THE VOID FRACTION MEASUREMENT OF GAS-LIQUID TWO-PHASE FLOW 1634

Ya Chang, Zhiyao Huang, Baoliang Wang, Haifeng Ji, Haiqing Li
ZheJiang University, China

GAS CONCENTRATION AND FLOW SPEED MEASUREMENTS USING A POLYMER-BASED MEMBRANE SENSOR 1638

Christoph Hepp¹, Florian Krogmann¹, Gerald Urban²
¹Innovative Sensor Technology IST AG, Switzerland; ²University of Freiburg, Germany

ENERGY-EFFICIENT, 0.1 NJ/CONVERSION TEMPERATURE SENSOR WITH TIME-TO-DIGITAL CONVERTER AND 1 °C ACCURACY IN -6 TO 64 °C RANGE 1642

Oleg Nizhnik¹, Kohei Higuchi¹, Kazusuke Maenaka¹, Travis Bartley²
¹Japan Science and Technology Agency, Japan; ²Tohoku University, Japan

PAPER-BASED MEMS HAIR CELL ARRAY 1647

Kevin Crowley, Diana Nakidde, Jeffrey Travis, Masoud Agah
Virginia Tech, United States

MICROWAVE DOPPLER FLOW SENSOR FOR CHEMICAL LOOPING COMBUSTION SYSTEMS 1651

David Greve¹, Irving Oppenheim¹, Benjamin Chorpening², Jared Charley^{2,3}
¹Carnegie Mellon University, United States; ²National Energy Technology Laboratory, United States; ³URS Corporation, United States

10:15 AM - 12:15 PM

C2P-K: OPTICAL SENSORS II

Poster Area - Baltimore AB

Session Chairs: Carlos Ruiz-Zamarreno, Ignacio R. Matias

TEMPERATURE EFFECTS IN CHROMATIC CONFOCAL DISTANCE SENSORS 1655

Garry Berkovic, Shlomo Zilberman, Ehud Shafir
Soreq NRC, Israel

AN EVENT-DETECTION HIGH DYNAMIC RANGE CMOS IMAGE SENSOR 1658

Gözen Köklü, Dechao Sun, Yusuf Leblebici, Giovanni De Micheli, Sandro Carrara
Swiss Federal Institute of Technology (EPFL), Switzerland

DISTRIBUTED TEMPERATURE MONITORING USING OFDR-BASED RAYLEIGH BACKSCATTERING FOR LIQUID SODIUM LEAKAGE DETECTION B#5

Romain Cotillard¹, Guillaume Laffont¹, Ekaterina Boldyreva¹, Pierre Ferdinand¹, Denis Cambet², Serge Albaladéjo², Pierre Charvet², Jean-Philippe Jeannot², Gilles Rodriguez²
¹CEA, LIST, France; ²CEA, DTN, France

OPTOFLUIDIC OUT-OF-PLANE INTERFEROMETER 1665

Lukas Brandhoff, Michael Johannes Vellekoop
University of Bremen, Germany

SENSITIVITY ENHANCEMENT OF A HUMIDITY SENSOR BASED ON POLY(SODIUM PHOSPHATE) AND POLY(ALLYLAMINE HYDROCHLORIDE) 1669

Miguel Hernaez, Diego Lopez-Torres, Cesar Elosua, Ignacio Raul Matías, Francisco Javier Arregui
Public University of Navarra, Spain

VIBRATION MONITORING WITH A SILICON MICRO-FABRICATED DEVICE COUPLED TO AN OPTICAL FIBER 1673

Jose Mireles Jr.², Angel Saucedo², Juan Ibarra², Ivan Muñoz², Gustavo Lara², Roberto Ambrosio², Abimael Jimenez², Estrada V. Horacio¹
¹*Centro Nacional de Metrologia, Mexico;* ²*Universidad Autonoma de Ciudad Juarez, Mexico*

DEFECT-ASSISTED PLASMONIC SENSING 1677

Jayson Briscoe¹, Sang-Yeon Cho¹, Igal Brener²
¹*New Mexico State University, United States;* ²*Sandia National Laboratories, United States*

A 3T LINEAR-LOGARITHMIC CMOS IMAGE SENSOR B#5

Santosh Koppa, Youngjoong Joo
University of Texas at San Antonio, United States

A 10.6μM X 10.6μM CMOS SPAD WITH INTEGRATED READOUT 1684

Khandaker A. Al Mamun, Mohammad Habib, David Bishai, Nicole McFarlane
University of Tennessee, Knoxville, United States

PLASMONIC AND BOLOMETRIC TERAHERTZ GRAPHENE SENSORS 1688

Michael Shur², Andrey Muraviev², Sergey Rumyantsev², Wojtech Knap³, Guanxiong Liu¹, Alexander Balandin¹
¹*University of California, Riverside, United States* ²*Rensselaer Polytechnic Institute, United States;* ³*Université Montpellier 2, France*

PORTABLE OPTICAL SENSOR USING TUNABLE OPTICAL MULTILAYERS 1691

Andras Kovacs, Aina Malisaukaite, Alexey Ivanov, Ulrich Mescheder
Hochschule Furtwangen University, Germany

IN-FIBER INTERFEROMETERS FOR TEMPERATURE CORRECTED REFRACTIVE INDEX SENSING WITH GUIDED AND LEAKY MODES 1695

Jeremie Harris, Ping Lu, Hugo Larocque, Liang Chen, Xiaoyi Bao
University of Ottawa, Canada

DISCRIMINATION OF TEMPERATURE AND AXIAL STRAIN USING DISPERSION EFFECTS OF HIGH-ORDER-MODE FIBERS 1699

Yanping Xu², Ping Lu^{1,2}, Jia Song², Liang Chen², Xiaoyi Bao², Xiaopeng Dong³, Ping Lu¹
¹*National Research Council Canada, Canada;* ²*University of Ottawa, Canada;* ³*Xiamen University, China*

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C2P-L: SENSOR NETWORKS II

Poster Area - Baltimore AB

Session Chairs: Elliott Brown

EFFECT OF LOCATION ON THE LATENCY IN CLUSTER-BASED WSNS 1703

Deepa Padmanabhan, Fabrice Labeau
McGill University, Canada

DEVELOPMENT OF SUSPENDED PLANAR TWO PORT MICRO TRANSFORMER FOR RF WIRELESS APPLICATION 1707

I-Yu Huang, Wen-Hui Huang, Chian-Hao Sun
National Sun Yat-sen University, Taiwan

A NEW NON-INVASIVE VOLTAGE MEASUREMENT METHOD FOR WIRELESS ANALYSIS OF ELECTRICAL PARAMETERS AND POWER QUALITY 1711

Domenico Balsamo², Danilo Porcarelli², Luca Benini², Davide Brunelli¹
¹*University of Trento, Italy;* ²*University of Bologna, Italy*

PERFORMANCE OF DMSA ALGORITHM IN HYBRID SENSOR NETWORKS 1715

Ariton Xhafa, Xiaolin Lu, Ryan Nuzzaci, Jianwei Zhou
Texas Instruments, Inc., United States

LIGHTWEIGHT DIGITAL HARDWARE RANDOM NUMBER GENERATORS 1719

Teng Xu, Miodrag Potkonjak
University of California, Los Angeles, United States

VOLTAGE-BASED ESTIMATION OF RESIDUAL BATTERY ENERGY IN WIRELESS SENSOR SYSTEMS 1723

Jaeung Kim, Dong Kun Noh
Soongsil University, Korea, South

CLUSTER HEAD LOAD DISTRIBUTION SCHEME FOR WIRELESS SENSOR NETWORKS 1727

Prasenjit Chanak, Tuhina Samanta, Indrajit Banerjee
Bengal Engineering and Science University, Shibpir, India

DISTRIBUTED CLUSTERING ALGORITHM FOR MOBILE WIRELESS SENSORS NETWORKS 1731

Fatiha Djemili², Wessam Ajib¹, Abdellatif Obaid¹
¹*Université du Québec a Montréal, Canada;* ²*Badji Mokhtar-Annaba University, Algeria*

REGION BASED THREE DIMENSIONAL REAL-TIME ROUTING PROTOCOL FOR WIRELESS SENSOR NETWORKS 1735

Sarab Al Rubeaai, Brajendra Singh, Mehmood Abd, Kemal Tepe
University of Windsor, Canada

10:15 AM - 12:15 PM

C2P-M: OTHER SENSORS TOPICS II

Poster Area - Baltimore AB

Session Chair: Goutam Koley

CALIBRATION OF GRADIOMETER BY SOLVING NONLINEAR EQUATIONS AND ITS PARAMETERS GENERALITY TEST B#5

Hongfeng Pang, Mengchun Pan, Jiafei Hu, Dixiang Chen, Feilu Luo
National University of Defense Technology, China

ANALYSIS OF MECHANICAL STRENGTHENING OF SI CANTILEVER BY CHEMICAL KOH ETCHING 1743

Yosuke Niimi, Tatsuya Hasegawa, Tomoaki Sugino, Satoshi Hamaoka, Kenji Fukuzawa, Mitsuhiro Shikida
Nagoya University, Japan

STUDY OF NON-SPECIFIC PROTEIN ABSORPTION OF GLUCOSE SENSORS COATED WITH ELECTRO-POLYMERIZED ZWITTERIONIC HYDROGEL B#5

Yichuan Hu, Guang Yang, Bo Liang, Lu Fang, Keda Shi, Xuesong Ye
ZheJiang University, China

DESIGN AND IMPLEMENTATION OF A SELF-CALIBRATING, COMPACT MICRO STRIP SENSOR FOR IN-SITU DIELECTRIC SPECTROSCOPY AND DATA TRANSMISSION.....	1751
Gunjan Pandey, Ratnesh Kumar, Robert Weber <i>Iowa State University, United States</i>	
THE EFFECT OF TRUE HUMAN SYNOVIAL FLUID ON THE FUNCTIONALITY OF AN IN VIVO PRESSURE SENSOR ELEMENT	1755
Ingelin Clausen, Lars Geir Whist Tvedt, Sigurd Moe, Andreas Vogl <i>SINTEF, Norway</i>	
AN EXOTHERMAL ENERGY RELEASE LAYER FOR MICROCHIP TRANSIENCE.....	1759
Shashank Pandey, Carlos Mastrangelo <i>University of Utah, United States</i>	
ACOUSTIC AND ELECTRICAL PROPERTIES OF CA3TAGA3SI2O14 PIEZOELECTRIC RESONATORS AT ELEVATED TEMPERATURES	1763
Ward Johnson ² , Michal Schulz ¹ , Holger Fritze ¹ ¹ <i>Clausthal University of Technology, Germany;</i> ² <i>National Institute of Standards and Technology, United States</i>	
DEEP NLD PLASMA ETCHING OF FUSED SILICA AND BOROSILICATE GLASS	1767
Mohammed Jalal Ahamed, Doruk Senkal, Alexander Trusov, Andrei Shkel <i>University of California, Irvine, United States</i>	
LONG-TERM THERMAL MECHANICAL STABILITY OF PECVD AMORPHOUS SILICON CARBIDE FILMS FOR HARSH ENVIRONMENT MICROELECTROMECHANICAL SYSTEMS	1771
Michael LaBarbera ¹ , Christian Zorman ¹ , Maximilian Scardelletti ² ¹ <i>Case Western Reserve University, United States;</i> ² <i>NASA Glenn Research Center, United States</i>	
TIOX MEMRISTORS WITH VARIABLE TURN-ON VOLTAGE USING FIELD-EFFECT FOR NON-VOLATILE MEMORY	1775
Pradeep Pai, Faisal Chowdhury, Tien-Vinh Dang-Tran, Massood Tabib-Azar <i>University of Utah, United States</i>	
MOX GAS SENSORS USING MULTILAYER AEROGEL	1779
Sanjay Kumar, Mohammad Madani, Mohammad Seyedjalali <i>University of Louisiana at Lafayette, United States</i>	
A ROBUST VACNF PLATFORM FOR ELECTROCHEMICAL BIOSENSOR.....	1783
Khandaker A. Al Mamun ² , Fahmida S. Tulip ² , Kimberly MacArthur ² , Nicole McFarlane ² , Syed Kamrul Islam ² , Dale Hensley ¹ , Ivan I. Kravchenko ¹ ¹ <i>Oak Ridge National Laboratory, United States;</i> ² <i>University of Tennessee, Knoxville, United States</i>	
SHORT-RANGE REMOTE POWERING FOR LONG-TERM IMPLANTED SENSOR SYSTEMS IN FREELY MOVING SMALL ANIMALS	1787
Enver G. Kilinc ¹ , Franco Maloberti ² , Catherine Dehollain ¹ ¹ <i>Ecole Polytechnique Federale de Lausanne, Switzerland;</i> ² <i>Università degli Studi di Pavia, Italy</i>	
POWER-ERROR ANALYSIS OF SENSOR ARRAY REGRESSION ALGORITHMS FOR GAS MIXTURE QUANTIFICATION IN LOW-POWER MICROSYSTEMS.....	1791
Yuning Yang, Jinfeng Yi, Rong Jin, Andrew Mason <i>Michigan State University, United States</i>	
A BULK MICROMACHINED SILICON NEURAL PROBE WITH NANOPOROUS PLATINUM ELECTRODE FOR LOW IMPEDANCE RECORDING.....	1795
Yijae Lee, Su Jin Lee, Hyosang Yoon, Jae Young Park <i>Kwangwoon University, Korea, South</i>	

ENHANCING MEASUREMENT ACCURACY OF POSITION SENSITIVE DETECTOR (PSD) SYSTEMS USING THE KALMAN FILTER AND DISTORTION RECTIFYING 1799

Yudong Luo, Yantao Shen, Jose Cordero, Josette Zaklit
University of Nevada, Reno, United States

SPECTRAL ESTIMATION USING DUAL SENSORS WITH UNCORRELATED NOISE..... 1803

Andrew Fleming, Brett Ninness, Adrian Wills
University of Newcastle, Australia

RESOLUTION OF SENSORS WITH CAPACITIVE SOURCE IMPEDANCE 1807

Yik Ren Teo, Andrew Fleming
University of Newcastle, Australia

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C2P-N: OPEN POSTER II

Poster Area - Baltimore AB

Session Chairs: Troy Nagle

OPTICAL PHASE-SHIFT EFFECTS FROM SURFACE ADSORPTION IN TRANSPARENT POLYMERS: APPLICATION OF WAVEFRONT DISTORTION MEASUREMENTS TO CHEMICAL SENSORS

Donald Snyder
Eastern Michigan University, United States

ROGOWSKI COIL SENSOR AND INTEGRATOR: OPERATION AND DEPENDENCE ON VARIOUS PHYSICAL PARAMETERS

Arash Hajjam, Sam Seyfi, C. Scott Brown, George Langer, Mitch Morse
Magnelab Inc, United States

FREQUENCY DOMAIN MEASUREMENTS FOR VIBRATIONAL NOISE REMOVAL

William Wilson¹, Gary Atkinson²
¹NASA Langley Research Center, United States; ²Virginia Commonwealth University, United States

DEVELOPMENT OF A HIGH SPEED AIR-COUPLED DUAL-CHANNEL IMPULSE GROUND PENETRATING RADAR FOR TRANSPORTATION INFRASTRUCTURE SAFETY INSPECTION

Yu Zhang, Anbu Venkatas, Tian Xia, Dryver Huston
University of Vermont, United States

IMAGE-BASED SPECTROSCOPY FOR ENVIRONMENTAL MONITORING

Alpha Mansaray, Rosalind Wynne, Eduard Bachmakov, Carolyn Molina
Villanova University, United States

WEBCAM AND SMART-PHONE FOR PASSIVE EMISSION COLORIMETRIC SENSORS OF FORMALDEHYDE

Jietae Lee³, Seungjae Lee², Young Hoon Na³, Sin Kim³, Jiryang Lee¹
¹Corny Tech Inc., Korea, South; ²Johns Hopkins University, United States; ³Kyungpook National University, Korea, South

AC/DC LINEAR MAGNETIC SCANNER FOR BUILDING INDUSTRY

Ales Zikmund², Jan Vyhnánek², Michal Janosek¹
¹FEE, CTU in Prague, Czech Republic; ²UCEEB, CTU in Prague, Czech Republic

FLEXIBLE NEEL EFFECT CURRENT SENSOR

Eric Vourc'h³, Pierre-Yves Joubert¹, Lionel Cima²
¹IEF CNRS, France; ²Neology, France; ³SATIE CNRS, France

WORK FUNCTION FLUCTUATIONS FOR SENSING BY POLYANILINE FILMS

Ryan West², Mira Josowicz¹, Jiri Janata¹

¹Georgia Institute of Technology, United States; ²National Institute of Standards and Technology, United States

DESIGN AND ELECTRO-THERMAL ANALYSIS OF SURFACE MICROMACHINED PERFORATED MEMBRANE HOTPLATE FOR CHEMICAL GAS SENSOR APPLICATIONS

Amit Kumar, Golla Eranna

CSIR-CEERI, India

A COMPACT, VERSATILE SIX-PORT RADAR SENSOR FOR INDUSTRIAL AND MEDICAL APPLICATIONS

Sarah Linz², Gabor Vinci¹, Stefan Lindner², Sebastian Mann², Francesco Barbon², Robert Weigel², Alexander Koelpin²

¹InnoSenT GmbH, Germany; ²University of Erlangen-Nuremberg, Germany

TRL: RAY TRACING-ASSISTED SENSOR LOCALIZATION FOR UNDERWATER ACOUSTIC SENSOR NETWORKS

Y Kim, C Kim

GIST, Korea, South

THICKNESS MEASUREMENT OF HEAVY & LIGHT OIL USING BLUE LIGHTS

Sangwoo Oh, Moonjin Lee

KIOST, Korea, South

2:00 PM - 3:15 PM
C3L-A: CHEMICAL & GAS SENSORS I
Maryland F
Session Chair: Don L. DeVoe

2:00 PM
A NOVEL SMECTITE-POLYMER NANOCOMPOSITE (SPN) MICROSTRIP SENSOR FOR RAPID QUANTITATIVE DETECTION OF AFLATOXINS 1811
He Hu, Jun Zou, Youjun Deng
Texas A&M University, United States

2:15 PM
CONTROLLED DRUG RELEASE IN A MICROFLUIDIC DEVICE WITH DROPLET MERGING AND STORAGE FUNCTIONS 1815
Wen-Chuan Cheng, Yuan He, Long Que
Louisiana Tech University, United States

2:30 PM
SENSITIVE DETECTION OF MELAMINE WITH SILICON NANOWIRE FIELD EFFECT TRANSISTOR BIOSENSOR 1819
Ruhai Tian², Suresh Regonda², Serena Greene¹, Gang Zhi³, Jiahuan Ding¹, Walter Hu²
¹Diagtronix Inc., United States; ²University of Texas at Dallas, United States; ²Global Foundry, United States; ³National Institute of Biological Sciences, China

2:45 PM
DEVELOPMENT OF A LOW COST HEMIN BASED DISSOLVED OXYGEN SENSOR WITH ANTI-BIOFOULING COATING FOR WATER MONITORING 1823
Huan-Hsuan Hsu, P. Ravi Selvaganapathy
McMaster University, Canada

3:00 PM
FREE-STANDING PARYLENE C THIN FILMS AS FLEXIBLE PH SENSING MEMBRANES 1827
Tatiana Trantidou, Mehvesh Tariq, Yu-Chun Chang, Christofer Toumazou, Themistoklis Prodromakis
Imperial College London, United Kingdom

2:00 PM - 3:15 PM
C3L-B: SENSOR APPLICATIONS FOR LIFE AND SOCIETY
Maryland E
Session Chairs: Geoffrey Cranch, Tao Li

2:00 PM
RANDOM WALK AND LIGHTING CONTROL 1831
Matthew Aldrich, Akash Badshah, Brian Mayton, Nan Zhao, Joseph Paradiso
Massachusetts Institute of Technology, United States

2:15 PM
WIRELESS SENSOR NODE FOR BACKSCATTERING ELECTRICAL SIGNALS GENERATED BY PLANTS 1835
Christos Konstantopoulos, Eleftherios Kampianakis, Eftichios Koutroulis, Aggelos Bletsas
Technical University of Crete, Greece

2:30 PM
COTS-BASED STICK-ON ELECTRICITY METERS FOR BUILDING SUBMETERING 1839
Michael Lorek², Fabien Chraim², Steven Lanzisera¹, Kristofer Pister²
¹Lawrence Berkeley National Laboratory, United States; ²University of California, Berkeley, United States

2:45 PM

PARETO-OPTIMAL SIGNAL PROCESSING ON LOW-POWER MICROPROCESSORS 1843

Peter Christ, Gregor Sievers, Julian Einhaus, Thorsten Jungeblut, Mario Pormann, Ulrich Rückert
Bielefeld University, Germany

3:00 PM

IMAGE SENSING SYSTEM FOR NAVIGATING VISUALLY IMPAIRED PEOPLE 1847

Thomas Gonnot, Jafar Saniie
Illinois Institute of Technology, United States

2:00 PM - 3:15 PM

C3L-C: PHYSICAL SENSORS II

Maryland A

Session Chairs: Goutam Koley, Gaurav Bahl

2:00 PM

**FATIGUE CRACK DETECTION OF CFRP COMPOSITE PRESSURE VESSEL USING
MECHANOLUMINESCENT SENSOR 1851**

Naohiro Ueno³, Chao-Nan Xu^{2,4}, Shogo Watanabe¹
¹HyTReC, Japan; ²National Institute of Advanced Industrial Science and Technology (AIST), Japan; ³Saga University, Japan, ⁴Kyushu University

2:15 PM

**A PASSIVE, WIRELESS STRAIN SENSOR USING A MICROFABRICATED MAGNETOELASTIC BEAM
ELEMENT 1855**

Venkatram Pepakayala, Yogesh B. Gianchandani
University of Michigan, United States

2:30 PM

MULTI-POINT BEARING CAGE WIRELESS TEMPERATURE SENSOR 1859

Amir Shahidi, Lokesh Gupta, Dimitrios Peroulis
Purdue University, United States

3:00 PM

FABRICATION OF A SANDWICH TYPE THREE AXIS CAPACITIVE MEMS ACCELEROMETER 1863

Serdar Tez, Tayfun Akin
Middle East Technical University, Turkey

2:00 PM - 3:15 PM

C3L-D: OPTICAL SENSORS ON SILICON

Maryland D

Session Chair: Michael Shur

2:00 PM

SILICON PHOTOMULTIPLIER TECHNOLOGY FOR LOW-LIGHT INTENSITY DETECTION B#5

Massimo Mazzillo, Ferenc Nagy, Delfo Sanfilippo, Giusy Valvo, Beatrice Carbone, Angelo Piana, Giorgio Fallica
STMicroelectronics, Italy

2:15 PM

**A NEW POSITION-SENSITIVE SILICON PHOTOMULTIPLIER WITH SUBMILLIMETER
SPATIAL RESOLUTION FOR PHOTON-CLUSTER IDENTIFICATION 1871**

Ilaria Sacco², Peter Fischer², Alberto Gola¹, Claudio Piemonte¹
¹Fondazione Bruno Kessler, Italy; ²Heidelberg University, Germany

2:30 PM

OUTPUT RESPONSE CHARACTERISTICS OF RESONANT-TYPE GUIDED-WAVE OPTICAL ACOUSTIC EMISSION SENSOR 1875

Sotaro Tachibana, Masashi Ohkawa, Takashi Sato
Niigata University, Japan

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OPTICAL SPECTRAL RESPONSE FOR RELATIVE HUMIDITY MEASURED WITH POLYVINYLPIRROLIDONE-COATED MACH-ZEHNDER INTERFEROMETER 1879

Myoung Jin Kim, Eun Joo Jung, Woo Jin Lee, Sung Hwan Hwang, Byung Sup Rho
Korea Photonics Technology Institute, Korea, South

3:00 PM

UV-SENSITIVE LOW DARK-COUNT PUREB SINGLE-PHOTON AVALANCHE DIODE..... 1883

Lin Qi², K.R.C. Mok², Edoardo Charbon², Lis K. Nanver², Mahdi Aminian¹
¹*Ecole Polytechnique Fédérale de Lausanne, Switzerland;* ²*Delft University of Technology, Netherlands*

2:00 PM - 3:15 PM

C3L-E: LATE NEWS I

Watertable ABC

Session Chair: Usha Varshne

2:00 PM

DIRECT DETECTION OF ADENOVIRUS IN ENVIRONMENTAL WASTE WATERS BY PORTABLE OPTICAL FIBER SENSOR PLATFORM..... 1887

Nimet Yildirim¹, Dan Li², Feng Long², April Gu¹
¹*Northeastern University, United States;* ²*Tsinghua University, China*

2:15 PM

LOW-NOISE SMART SENSOR BASED ON SILICON NANOWIRE FOR MEMS RESISTIVE MICROPHONE 1892

Jamel Nebhen², Eric Savary², Wenceslas Rahajandraibe², Christian Dufaza², Stephane Meillère², E. Kussener², Herve Barthelémy², J. Czarny¹, Arnaud Walther¹
¹*CEA-LETI, France;* ²*Aix Marseille University, France*

2:30 PM

POLYMER-BASED MICROFLUIDIC DEVICES FOR RARE CELL DETECTION BY ULTRASOUNDS.....B#5

Itziar Gonzalez¹, Victor Acosta¹, Maria Tijero³, Javier Berganzo³, Adela Castillejo², Jose Luis Soto², Alain Martin⁴, Mounir Bouali⁴
¹*CSIC, Spain;* ²*Hospital General Universitario de Elche, Spain;* ³*IKERLAN, Spain;* ⁴*University Politecnica Mondragon, Spain*

2:45 PM

A NOVEL INKJET-PRINTED CHIPLESS RFID-BASED PASSIVE FLUID SENSOR PLATFORM..... 1900

Sangkil Kim², James Cooper², Manos Tentzeris², Robert Herre¹, Sijia Gu³, Tuami Lasri³
¹*Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany;* ²*Georgia Institute of Technology, United States;* ³*Université Lille 1, France*

3:00 PM

PLATINUM FUNCTIONALIZED TITANIA NANOTUBE ARRAY SENSOR FOR DETECTION OF TRICHLOROETHYLENE IN WATER 1904

Harikrishnan Jayamohan, York Smith, Bruce Gale, Manoranjan Misra, Swomitra Mohanty
University of Utah, United States

2:00 PM - 3:15 PM

C3L-F: HARVESTING & CONVERTERS

Homeland

Session Chairs: Christopher Salthouse, Christian Zorman

2:00 PM

A MULTI-ANODE PAPER-BASED MICROBIAL FUEL CELL FOR DISPOSABLE BIOSENSORS..... 1908

Arwa Fraiwan, Seokheun Choi
Binghamton University, United States

2:15 PM

AN ULTRA-LOW-POWER ACTIVE AC-DC CMOS CONVERTER FOR SUB-1V INTEGRATED ENERGY HARVESTING APPLICATIONS 1912

Abdallahman Sayed Herbawi, Oliver Paul, Tzeno Galchev
University of Freiburg, Germany

2:30 PM

PERFORMANCE METRICS FOR THERMOELECTRIC ENERGY HARVESTING STUDIED USING A NOVEL PLANAR 65 NM SILICON CMOS-BASED THERMOPILE 1916

Hal Edwards, Jeff Debord, Toan Tran, Dave Freeman, Ken Maggio
Texas Instruments, Inc., United States

2:45 PM

SCHEME FOR IMPROVED INTEGRATION AND LIFETIME FOR PIEZOELECTRIC ENERGY HARVESTERS 1920

Alwyn Elliott¹, James Dicken¹, Lindsay Miller², Paul Wright², Paul Mitcheson¹
¹*Imperial College London, United Kingdom;* ²*University of California, Berkeley, United States*

3:00 PM

TOWARDS A SELF-SUSTAINED MOISTURE AND TEMPERATURE MONITORING SYSTEM USING SOIL ENERGY 1924

Fu-To Lin¹, Jen-Chien Hsieh¹, Fu-Chun Wen¹, Wei-Kuan Wang¹, Huang-Chen Lee¹, Yu-Te Liao^{1,2}
¹*National Chung-Cheng University, Taiwan;* ²*National Chiao-Tung University*

3:45 PM - 5:00 PM

C4L-D: OPTICAL SENSOR SIGNAL ANALYSES

Maryland D

Session Chairs: Paddy French, Carlos Ruiz-Zamarreno

3:45 PM

MRI-COMPATIBLE OPTICALLY-SENSED CELLO 1928

Avrum Hollinger, Marcelo Wanderley
McGill University, Canada

4:00 PM

SIGNAL PROCESSING FOR ELECTRO-OPTIC VOLTAGE SENSOR 1932

Olivier Steiger¹, Sergio Marchese¹, Joris Pascal¹, Klaus Bohnert¹, Stephan Wildermuth²
¹*ABB Switzerland Inc., Switzerland;* ²*ABB Germany Inc., Germany*

4:15 PM

A COMPARISON OF TECHNIQUES FOR EXTRACTING TRANSVERSE SPEED FROM PHOTON DOPPLER VELOCIMETRY SIGNAL CONTENT 1936

Erik Moro, Matthew Briggs, Lawrence Hull
Los Alamos National Laboratory, United States

4:30 PM
SILICON NITRIDE BASED MID-INFRARED MICROPHOTONICS FOR SENSOR APPLICATIONS 1940
Pao Lin, Vivek Singh, Lionel Kimerling, Anuradha Agarwal
Massachusetts Institute of Technology, United States

3:45 PM - 5:00 PM
C4L-E: LATE NEWS II
Watertable ABC
Session Chairs: Usha Varshney

3:45 PM
A MIXED APPROACH LOAD BALANCING AND EFFICIENT ENERGY FOR MULTI-PATH ROUTING IN MOBILE AD HOC NETWORKS B#5
Fatiha Djemili, Cherif Tolba
Badji Mokhtar-Annaba University, Algeria

4:00 PM
INDOOR POSITIONING WITH MAXIMUM LIKELIHOOD CLASSIFICATION OF WI-FI SIGNALS 1948
Noah Pritt
Frederick Community College, United States

4:15 PM
MICROCONTROLLER-BASED POWER MANAGEMENT FOR NANOWATT AND MICROWATT ENERGY HARVESTERS 1952
Dusan Vuckovic
DELTA – IdemoLab/Technical University of Denmark, Denmark

4:30 PM
DESIGN AND PERFORMANCE OF A REAL-TIME ACOUSTIC BEAMFORMING SYSTEM 1956
Alaa Abdeen, Laura Ray
Dartmouth College, United States

4:45 PM
OPEN ARCHITECTURE FOR WSN BASED ON RUNTIME RECONFIGURABLE SYSTEMS AND THE IEEE 1451 1960
Jean Guevara¹, Enrique Vargas¹, Fernando Brunetti¹, Federico Barrero²
¹*Universidad Catolica Nuestra Señora de la Asuncion, Paraguay;* ²*Universidad de Sevilla, Spain*

3:45 PM - 5:00 PM
C4L-F: CHARACTERIZATION & TESTING
Homeland
Session Chairs: Babak Ziaie, Christian Zorman

3:45 PM
WAVELENGTH DISPERSION OF VERDET CONSTANT IN E-FIELD ORIENTED IRON OXIDE DOPED POLYMER NANOCOMPOSITES 1964
Ganapathy Kumar, Satish Mahajan
Tennessee Technological University, United States

4:00 PM
HETEROGENEOUS INTEGRATION OF AN INAS NANOWIRE WITH ENERGY-EFFICIENT CMOS DELTA-SIGMA MODULATOR 1967
Kenji Michimata, Hiroaki Kotani, Tatsuro Watanabe, Hiroaki Funayama, Shin Murakami, Kazuhiko Shimomura, Takao Waho
Sophia University, Japan

4:15 PM

IMPACT OF GAMMA RADIATION ON RANGE FINDING SENSOR PERFORMANCE..... 1971

Zachary Diggins, Nagabhushan Mahadevan, Dan Herbison, Eric Barth, Arthur Witulski
Vanderbilt University, United States

4:30 PM

**A NEW APPROACH ON MEMS SENSOR BATCH TESTING USING AN ANALOGUE PARALLEL TEST
METHODOLOGY FOR MASSIVE REDUCTION OF TEST TIME..... 1975**

Florian Oesterle, Robert Weigel, Alexander Koelpin
University of Erlangen-Nürnberg, Germany

4:45 PM

DEVELOPMENT OF NOVEL POLYMERIC SENSORS FOR TASTE SENSING: ELECTRONIC TONGUE 1979

Basudam Adhikari², Manmatha Mahato², Tridib Sinha², Arnab Halder², Nabarun Bhattacharya¹
¹*Centre For Development Of Advanced Computing (C-DAC), India;* ²*Indian Institute of Technology Kharagpur, India*