

ALLSENSORS 2020

The Fifth International Conference on Advances in Sensors, Actuators, Metering and Sensing

November 21 – 25, 2020

Valencia, Spain

ALLSENSORS 2020 Editors

Jaime Lloret Mauri, Polytechnic University of Valencia, Spain
Paulo E. Cruvinel, Embrapa Instrumentation, Brazil
Almudena Rivadeneyra-Torres, University of Granada, Spain
Michael Niedermayer, Beuth University of Applied Sciences - Berlin, Germany
Sandrine Bernardini, Aix Marseille University, France
Matteo Tonezzer, CNR-IMEM, Trento, Italy

Printed from e-media with permission by:

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



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

Copyright© (2020) by International Academy, Research, and Industry Association (IARIA) Please refer to the Copyright Information page.

Printed with permission by Curran Associates, Inc. (2020)

International Academy, Research, and Industry Association (IARIA) 412 Derby Way Wilmington, DE 19810

Phone: (408) 893-6407 Fax: (408) 527-6351

petre@iaria.org

Additional copies of this publication are available from:

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

Phone: 845-758-0400 Fax: 845-758-2633

Email: curran@proceedings.com Web: www.proceedings.com

Table of Contents

Almudena Rivadeneyra, Andreas Albrecht, Paolo Lugli, Markus Becherer, and Jose F Salmeron	I
Screen Printable Electrochemical Capacitors on Flexible Substrates Francisco J. Romero, Diego P. Morales, Markus Becherer, Almudena Rivadeneyra, and Noel Rodriguez	3
Low-Cost Energy-Autonomous Sensor Nodes Through RF Energy Harvesting and Printed Technology Fernando Moreno-Cruz, Francisco J. Romero, Noel Rodriguez, Diego P. Morales, and Almudena Rivadeneyra	8
UV-assisted Chemiresistive Alcohol Sensor Based on Cobalt Doped Tin Dioxide Mikayel Aleksanyan, Artak Sayunts, Hayk Zakaryan, Vladimir Aroutiounian, Valeri Arakelyan, and Gohar Shahnazaryan	13
Performance Comparison of pH Sensor Module with Wireless Transmission Function Lan Zhang, Jian Lu, and Ryutaro Maeda	18
Low Cost Measurement System for the Precise Monitoring of the Instantaneous Rotational Speed of an Internal Combustion Engine Dimitrios Nikolaos Pagonis, Grigoris Kaltsas, and Sofia Peppa	20
Screen Printed BaTiO3 for CO2 Gas Sensor Fabien Le Pennec, Sandrine Bernardini, Mohamad Hijazi, Carine Perrin-Pellegrino, Khalifa Aguir, and Marc Bendahan	24
Data Analysis-Based Gas Identification with a Single Metal Oxide Sensor Operating in Dynamic Temperature Regime Nicolas Morati, Thierry Contaret, Jean-Luc Seguin, Marc Bendahan, Oussama Djedidi, and Mohand Djeziri	26
Sensor and Electronic Circuits Development on Flexible Substrates through Additive Manufacturing Technologies for Textile Applications Josue Ferri, Jorge Moreno, Ana Rodes, Elena Mira, Jose Maria Garcia, Eduardo Garcia-Breijo, and Raul Llinares	30
The Use of the Arduino Embedded System as a Prototype of a Mobile System Controlling a Person's Breathing Using a Sensor Printed on a T-shirt Jaroslaw Wojciechowski and Ewa Skrzetuska	33
Sensors-Based Virtual Reality Environment for Volumetric CT Analyses of Agricultural Soil Samples Leonardo C. Botega and Paulo E. Cruvinel	36
Designing a Livestock Monitoring System and Evaluating the Performance of LoRa for a Farm Atsushi Ito, Jinshan Luo, Yoshikazu Nagao, Yuko Hiramatsu, Fumihiro Sato, and Takeo Watanabe	44

Testing Existing Prototypes of Conductivity Sensors for Monitoring the Concentration of Organic Fertilizers in Fertigation Systems Daniel A. Basterrechea, Javier Rocher, Lorena Parra, and Jaime Lloret	50
Portable E-nose for Diagnostic of Inflammation and Diverse Variation in Health Status of Humans and Animals Anastasiia Shuba, Tatiana Kuchmenko, Ruslan Umarkhanov, and Anton Chernitskiy	56
Detection and Classification of Obstacles Using a 2D LiDAR Sensor Alejandro Olivas Gonzalez and Fernando Torres Medina	63
A Novel Low-Concentration Isopropanol Gas Sensor Based on Fe-doped ZnO Nanoneedles Yifan Luo, Ahmadou Ly, Marc Debliquy, Driss Lahem, and Chao Zhang	67
Normal Distributions Transform-Based Mapping Using Scanning LiDAR Mounted on Motorcycle Kota Matsuo, Akihiko Yoshida, Masafumi Hashimoto, and Kazuhiko Takahashi	69
Design of an acoustic transducer structure for biosensing Emmanuel Attal, Sophie Sok, and Therese Leblois	76
Non-Linear Modeling and Sensitive Analysis of a Magnetostrictive Force Sensor Mojtaba Ghodsi, Morteza Mohammadzaheri, and Payam Soltani	78
Near-Ground Wireless Coverage Design in Rural Environments Marta Botella-Campos, Jose Miguel Jimenez, Sandra Sendra, and Jaime Lloret	84