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Contents

Volume 128
Issue 5
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Research Articles

Handbook of Laboratory Measurements and Instrumentation: Editorial Review <i>Sergey Y. Yurish</i>	1
Designing Fuzzy Adaptive Nonlinear Filter for Land Vehicle Ultra-Tightly Coupled Integrated Navigation Sensor Fusion <i>Chien-Hao Tseng, Dah-Jing Jwo</i>	1
Condition Monitoring of a Process Filter Applying Wireless Vibration Analysis <i>Pekka Koskela, Marko Paavola, Jukka Karjanlahti and Kauko Leiviskä</i>	17
Analysis of Radio Model Performance for Clustering Sensor Networks <i>H. Bello-Salau, A. F. Salami, F. Anwar, Md. Rafiqul Islam</i>	27
Wireless Crankarm Dynamometer for Cycling <i>Caetano Decian Lazzari, Alexandre Balbinot</i>	39
Prediction of the Surface Oxidation Process of AlCuFe Quasicrystals by Using Artificial Neural Network Techniques <i>Moh'd Sami S. Ashhab, Abdulla N. Oimat and Nabeel Abo Shaban</i>	55
Online Remote Recording and Monitoring of Sensor Data Using DTMF Technology <i>Niladri Sekhar Tripathy, Sagarika Pal</i>	66
Detection of VX Simulants Using Piezoresistive Microcantilever Sensors <i>Timothy Porter, Richard Venedam, Kevin Kyle and Gus Williams</i>	73
Study of a Modified Displacement Transducer of a Piston in a Power Cylinder <i>S. C. Bera and Madan Bhowmick</i>	81
Development of an Eletromiograph and Load Cell for the Silent Period Generation and Measurement in Myoelectric Signals of the Masseter and Temporal Muscles <i>Alexandre Balbinot, Jeferson Figueró Feijó</i>	89
New Method for Fabrication of Co₃O₄ Thin Film Sensors: Structural, Morphological and Optoelectronic Properties <i>Vikas Patil, Shailesh Pawar, Manik Chougule, Bharat Raut, Ramesh Mulik, Shashwati Sen</i>	100
Langmuir-Schäfer Film of Calix[4]pyrrole Exhibiting Sensing Properties with Gas Anesthetic Agent Sevoflurane <i>Salvatore Petralia</i>	115

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Handbook of Laboratory Measurements and Instrumentation: Editorial Review

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Published by the International Frequency Sensor Association (IFSA) Publishing¹, *Handbook of Laboratory Measurements and Instrumentation* 234-page practical oriented book presents to readers experimental and laboratory activities with an approach as close as possible to reality, even offering remote access to experiments, providing to the reader an excellent guide and tool for learning laboratory techniques, instruments and methodologies including methods of measurements, results analysis and errors evaluation.

Authors – internationally recognized scientists from the University of Porto (Portugal) - Maria Teresa Restivo, Fernando Gomes de Almeida, Maria de Fátima Chouzal, Joaquim Gabriel Mendes and António Mendes Lopes have confirmed that instrumentation is vital for the design and implementation of measuring, monitoring and actuation systems and in data acquisition systems and processing, playing nowadays a fundamental role in many technological areas, as well as in those of certification, control and information. The increasing demand of experimental accuracy in all scientific areas makes instrumentation for measurement a crucial component, particularly in higher education curricula with a strong technological element, being also essential at research and development level.

The publication of this handbook on Laboratory Measurements and Instrumentation is well-timed because when dealing nowadays with large classes it is very difficult for universities' teachers and professors to provide to the students direct contact with well-structured hands-on experimental measurements in real measuring laboratory. This well organized book presents to higher education students in engineering, physics, bioengineering and other related areas, a first overview of some of the most common measurement techniques, offering a close approximation to the real laboratory environments, which they may encounter at a later stage in their studies.

The *Handbook of Laboratory Measurements and Instrumentation* is organized by the logic and methodical way. An introduction is following by thirteen well-illustrated chapters on various aspects of measurement and instrumentation such as generic laboratory equipment, temperature, dimensional, force, strain, displacement, proximity and angular velocity measurements, data acquisition systems,

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web monitoring and control, bridge circuits for resistance, inductance and capacitance measurements, etc.

Each chapters of this book are independent, self-contained and followed by useful references collected at the end of book including fundamental books, articles and carefully selected web links. Each one presents a clearly defined learning objective, the essential concepts and a step-by-step guide for performing the experimental activity, various complementary multimedia contents and a final synthesis. The set of open questions that closes each chapter is intended to provide formative assessment. This unique book includes dozens simulations, animations and videos (see examples in Figures 1-3). It makes this title very valued and different from existing books on measurements and instrumentation.

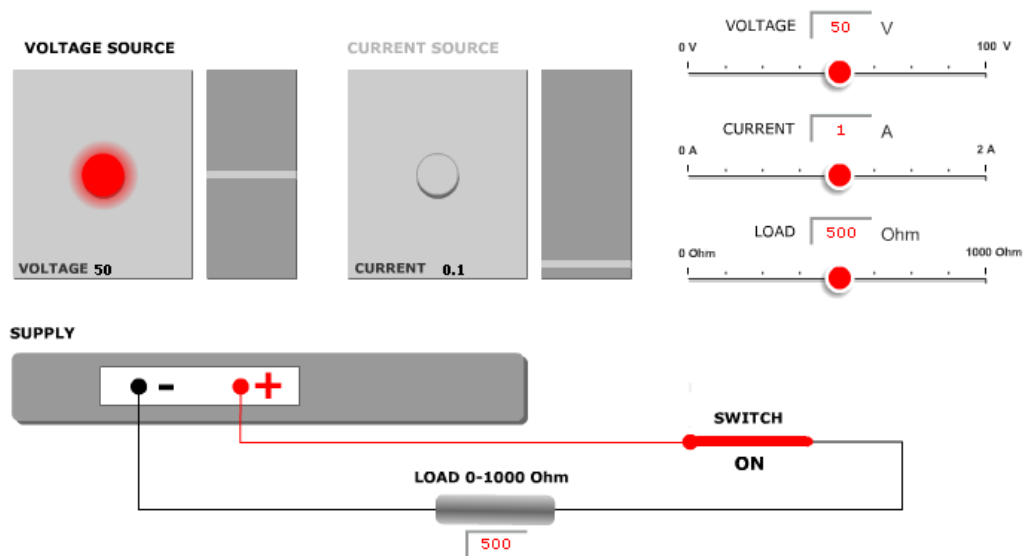


Fig. 1. Stabilized power supply simulator.

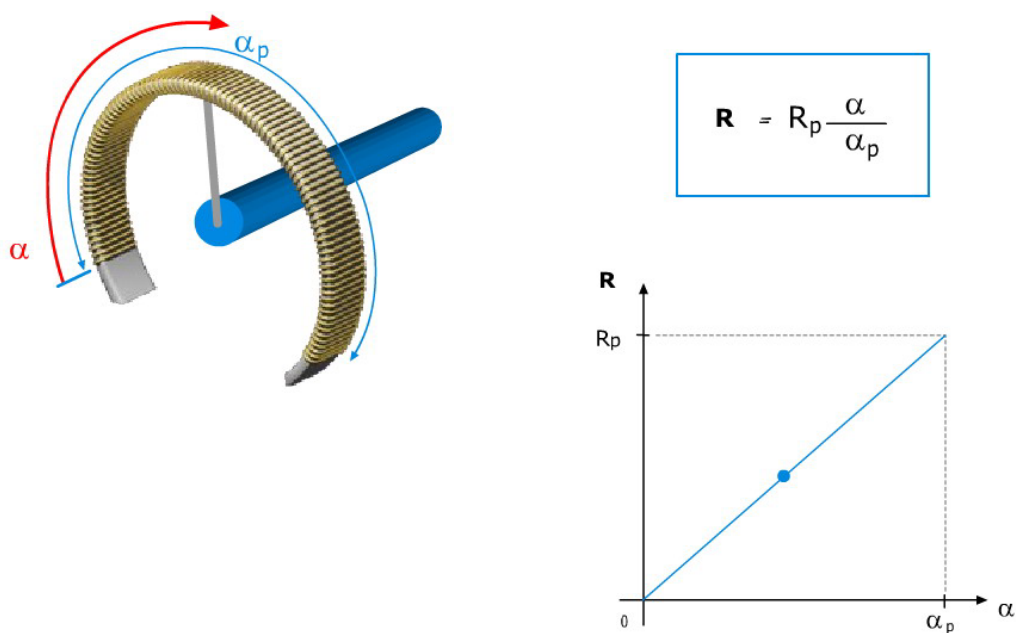


Fig. 2. Animation of resistance change due to sliding contact angular displacement.

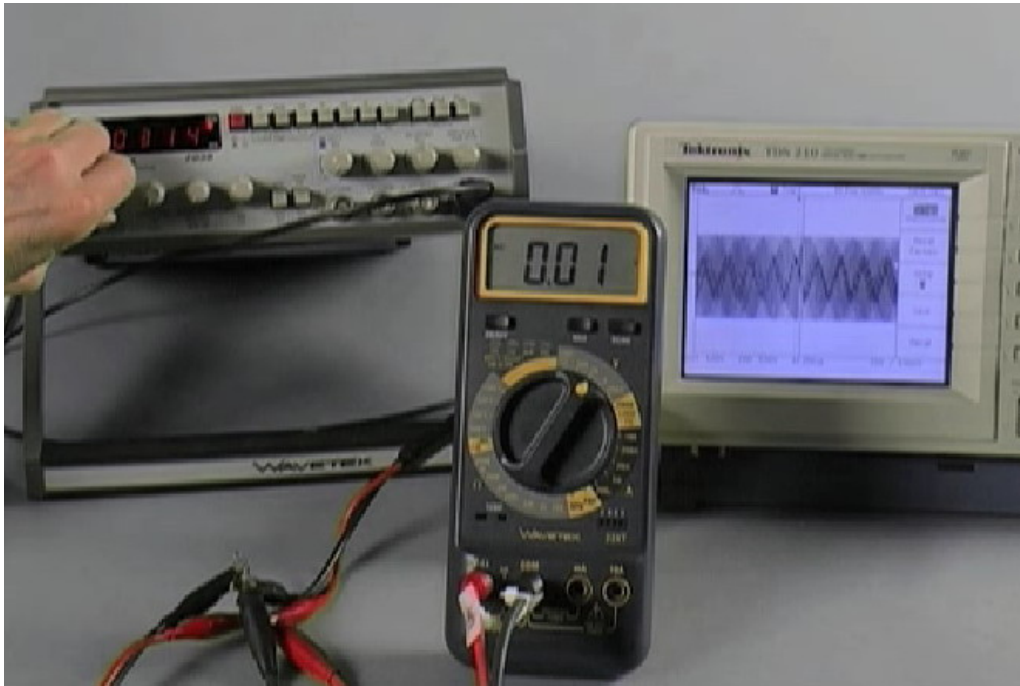


Fig. 2. Frequency response video.

The *Handbook of Laboratory Measurements and Instrumentation* not only fills the existing gaps in the available literature on measurements but also simultaneously opening the excellent prospects for the dissemination of know-how, technologies and techniques among students, researchers and engineers.

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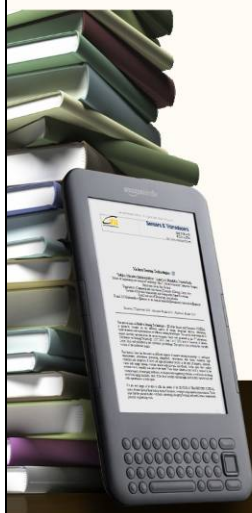
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Guide for Contributors

Aims and Scope

Sensors & Transducers Journal (ISSN 1726-5479) provides an advanced forum for the science and technology of physical, chemical sensors and biosensors. It publishes state-of-the-art reviews, regular research and application specific papers, short notes, letters to Editor and sensors related books reviews as well as academic, practical and commercial information of interest to its readership. Because of it is a peer reviewed international journal, papers rapidly published in *Sensors & Transducers Journal* will receive a very high publicity. The journal is published monthly as twelve issues per year by International Frequency Sensor Association (IFSA). In addition, some special sponsored and conference issues published annually. *Sensors & Transducers Journal* is indexed and abstracted very quickly by Chemical Abstracts, IndexCopernicus Journals Master List, Open J-Gate, Google Scholar, etc. Since 2011 the journal is covered and indexed (including a Scopus, Embase, Engineering Village and Reaxys) in Elsevier products.

Topics Covered

Contributions are invited on all aspects of research, development and application of the science and technology of sensors, transducers and sensor instrumentations. Topics include, but are not restricted to:

- Physical, chemical and biosensors;
- Digital, frequency, period, duty-cycle, time interval, PWM, pulse number output sensors and transducers;
- Theory, principles, effects, design, standardization and modeling;
- Smart sensors and systems;
- Sensor instrumentation;
- Virtual instruments;
- Sensors interfaces, buses and networks;
- Signal processing;
- Frequency (period, duty-cycle)-to-digital converters, ADC;
- Technologies and materials;
- Nanosensors;
- Microsystems;
- Applications.

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