

Guest Editorial

Special Issue on Sensors Tutorials: A Vigorous Dive Into the Vast Sea of Sensor-Related Knowledge—Part I

AS TECHNOLOGY advances in the 21st century, the inclusion of intelligence in any kind of system is becoming a necessity. First stage of intelligence, similarly to humans, is to observe and obtain information from the environment, which can only be achieved through the use of sensors. However, due to the wide diversity of the information to be obtained, the field of sensors has exploded in a multitude of directions. It currently spans from the classical physical sensors, such as temperature, force, torque, and many more, to vision sensors, such as cameras, to chemical and biological sensors, such as heavy metals, DNA, aptamers, and more, just to name a few.

This impressive diversity proves the multi-disciplinary nature of the sensor-field and the complex set of skills required by the researchers working in this field. Even though this multi-disciplinary knowledge of the sensors researchers is admirable, the process to gain that knowledge is not clear nor easy and it is specific to each case/sensor type. While most of the existing knowledge is available through textbooks, university courses, and published papers, the information is fragmented and scattered requiring a time-consuming and difficult process to be correctly obtained without any misunderstandings and confusions, especially from young scientists.

Sensors experts, except from creating new knowledge, also have the duty to correctly pass that knowledge to future generations of researchers; hence, the goal of this Special Issue is the generation of crash-courses in several sensor-related subjects in the form of tutorials. The best way to learn a new field without making any serious conceptual errors and without wasting the time on simple answers that experts in the field can answer in a matter of minutes is through tutorials.

This Special Issue has been divided into two parts with this being Part I consisting of 17 papers. In this issue, there are papers covering electrochemical sensors for heavy metals traces in solutions, the implications of correctly using All-Solid-State Ion-Selective-Electrodes, ISFETs as a platform for electrochemical sensing and the functionalization procedures of biosensors using Molecularly Imprinted Polymers and Digital Printing.

Furthermore, there are several papers focusing on impedance spectroscopy, which is an extremely powerful sensing method. This topic ranges from bioimpedance sensors to electrochemical impedance spectroscopy used for sensing gases and biological molecules to electrical impedance spectroscopy for sensing and the electronics circuits required to operate such sensing probes.

Part I of this Special Issue further includes papers on wearable sensors for intracranial pressure, systems for processing and transmitting muscular information, and a paper on Parkinson's disease recognition using artificial intelligence. A tutorial focusing on thermal sensors is also being featured, celebrating the 200th Anniversary of the Seebeck effect. In addition, tutorials on piezoelectrets, current sensing front-ends, and sensor cloud frameworks are included.

The Guest Editors would like to thank all authors for their interest in sharing their knowledge with the rest of the scientific community through their contributions, as well as the reviewers for their valuable efforts to ensure the high paper quality of the IEEE SENSORS JOURNAL. The Guest Editors would further like to thank Leigh Ann Testa, Professor Gerald Gerlach, Professor Sandro Carrara, and all the IEEE SENSORS JOURNAL Staff for their support, efficiency, and competence.

Due to space limitations, the names of the contributing Guest Editors to this unique Special Issue have been provided in the form of a list, instead of full affiliations and emails.

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