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IEEE Sensors Journal Special Issue on
Embedded Sensors for Fault Diagnosis in Electrical Wiring Interconnection Systems, Power Grids, Structural Cables, Pipelines, and Electrical Machines

In the era of Internet of Things (IoT), electrical wiring interconnection systems (EWIS) are massively hosted everywhere in many fields where the transfer of energy and information is a fundamental pillar to guarantee the good performance of a system. Besides, the huge technological and industrial uprising ensured by the emerging fourth Industrial Revolution is forcing electrical machines and instruments towards massive transformations and more complexity than ever before. Accordingly, the health and integrity of any system is essential for the proper operation of any application. Yet faults and failures are inevitable. They can lead to catastrophic problems on both economical and human levels. Airplane crashes, massive fires, explosions, etc. are examples of such consequences. Accordingly, fault detection, diagnosis and location have been always substantially important for ensuring safety, security, integrity and optimal performance for any system. Notably, fault diagnosis of structural cables integrated in dams, bridges, concrete, etc. have also formed a corner-stone in the context of health monitoring of such structures. The same applies for oil and gas pipelines, subsea cables, umbilicals, etc. Intelligent sensors and technologies that are able to take a potentially diverse array of data and create a picture of the system's condition help to determine the early detection of faults. Thus, sensors must have access to or contain intelligent features to detect the problems. It is therefore important to know wide varieties of sensors and technologies for fault diagnosis which can be deployed for the detection and inspection of systems and structures. The reported sensors and technologies should be able to inspect or measure without doing any harm or damage to the system. More importantly, the emergence of sensor networks and connected objects have created the need for embedded and non-invasive fault diagnosis solutions. A good deal different diagnosis sensing techniques with different characteristics, good performance and even limitations are available to different application areas. Within this context, there is an increasing demand for designing, developing, and fabricating different types of sensors and sensing technology based on existing or innovative techniques to accurately locate upcoming defects in any structure in an offline and online manner. Significantly, the continuous health monitoring of targeted systems is necessary at almost any stage in the life cycle of a system.

It is intended that this Special Issue of the IEEE Sensors Journal will highlight advances in the technologies proposed for the fault diagnosis of EWIS, structural cables, and electrical machines including new non-destructive sensing methods, hardware implementation of existing techniques, and the optimization of different aspects of current fault-inspecting sensors including their reliability, adaptability, validation and integration. This special issue will provide a forum with high visibility and synergy between theoretical and applied research in wire diagnostics and is expected to bring together scientists and engineers from the sensors, and the power and energy societies. Original research contributions, tutorials and review papers are sought in areas including (but not limited to):

- Advances in embedded and non-invasive fault sensing diagnosis solutions of all types for EWISs, power grids, structural cables, pipelines, and electrical machines.
- Development of enhancing fault location accuracy algorithms within or beyond the physical limits of components constituting existing system monitoring sensors.
- Design, implementation, and test of novel fault sensing principles.
- Application of specific sensor implementations for enabling simultaneous fault inspection and data communication.
- Sensors for progressive online troubleshooting of complex systems.
- Distributed senor communication strategies to cancel fault location ambiguities in complex structures and mitigate faults' consequences.
- Fault characteristics extraction and detection decision-making through machine learning algorithms.

Solicited and invited papers shall undergo the standard IEEE Sensors Journal peer review process. All manuscripts must be submitted on-line, via the IEEE Manuscript Central™, see http://mc.manuscriptcentral.com/sensors. When submitting, please indicate in the "Manuscript Type" roll down menu, and also by e-mail to Ms. Gina Colacchio, g.colacchio@ieee.org, that the paper is intended for the "Embedded Sensors for Fault Diagnosis in Electrical Wires, Interconnection Systems and Power Grids" Special Issue. Authors are particularly encouraged to **suggest names of potential reviewers** for their manuscripts in the space provided for these recommendations in Manuscript Central. For manuscript preparation and submission, please follow the guidelines in the Information for Authors at the IEEE Sensors Journal web page, http://www.ieee-sensors.org/journals.

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