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IEEE Sensors Journal Special issue on

Self-powered Sensors: Architectures, Applications and Challenges

Some sensors will inevitably be in remote and inaccessible areas, which can include oil and gas pipelines, long-distance transmission lines, remote forests and oceans areas, etc. Meanwhile, a general sensor usually needs to be driven by a power unit. As a result, the sustainability of a sensor becomes a hindrance due to energy storage's limited lifetime, when considering high mobility, wide distribution, and possible wireless operation of the sensors in sensor networks. Thus, traditional power supply methods such as cable or batteries are inaccessible, and how to continuously and reliably power a large number of sensors is a critical problem that needs to be solved. Self-powered sensors were proposed to solve this issue. They are nanosystems that harvest the ambient energy to power themselves. This way, they are able to operate independently, wirelessly, and sustainably, without a traditional power source. Self-powered sensors eliminated the most shackling issue in the current sensing field, thus enabling many previously unattainable application scenarios. With self-powered sensors, previously inaccessible sensing options become available, such as sensing in remote areas where periodical maintenance and power supply is unrealistic, or sealed environment often found in industrial applications. Self-powered sensors provide a viable solution to these scenarios.

While self-powered sensors are promising, there are still some challenges to overcome or researches to be done before they can be deployed on a large scale. To fully realize the benefits of self-powered sensors, researchers and industrial designers will need to solve the problem of effectively integrating self-powered sensors into the production process to solve these challenges. In this special issue, we welcome the recent research on the progress of self-powered sensors in architectures, applications and challenges. Topics include but are not limited to:

- Self-powered sensors in smart healthcare
- Self-powered sensors in Internet of Things
- Self-powered sensors in smart cities
- Packaging for self-powered sensors
- Design and implementation for self-powered sensors
- Signal processing and interfaces for self-powered sensors
- Materials, processing, and fabrication for self-powered sensors
- Industrial application of self-powered sensors

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 Leigh Ann Testa, testa.l@ieee.org, that the paper is intended for the "Self-powered Sensors: Architectures, Applications and Challenges" Special Issue. For manuscript preparation and submission, please follow the guidelines in the Information for Authors at the IEEE Sensors Journal web page, http://www.ieeesensors.org/journals.

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