IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM 2018), July 9-12, 2018, Auckland, New Zealand

Invited Session on

Energy Harvesting for Self-Powered Health Monitoring

Objectives:

Low-power embedded wireless sensors and wearable devices have received considerable interest from multiple disciplines due to rapidly increasing prospects in the online health monitoring for machinery, aerospace, and civil structures as well as human motion. Energy harvesting is one of significant enabling technologies for realizing intelligent autonomous health monitoring system. Successful implementation of autonomous health monitoring systems requires not only embedded sensors, data acquisition and wireless communication, but also smart energy harvesting mechatronics with frequency tuning capability for adapting time-varied environments. Recently, considerable efforts have been devoted to performance enhancement of extracting electrical energy from ambient energy sources such as vibration, thermal gradient, sun, wind, pressure, etc. It is well known that energy harvesting involves energy conversion materials and structures, interface and storage circuits, electromechanical coupling mechanisms. However, until now there are few successful applications due to complicated characteristics and interaction of monitoring objectives with energy harvesting devices. Therefore, to propel advances in energy harvesting for self-powered health monitoring, this special session will provide extensive investigations into smart structures, dynamic analysis, electromechanical model and optimization methods for increasing the power density and overall operational life under ambient excitation conditions and constrained size.

Potential topics include but are not limited to the following:

- Smart structures and materials for self-powered health monitoring
- Design, manufacturing, and modeling methods of multifunctional structures
- Dynamic and optimization under constrained conditions
- Wearable energy harvesting and health monitoring of human motions
- Self-powered and low power sensors and signal processing
- Integration of structural health monitoring and energy harvesting
- Potential applications such as aerospace structures, wind turbines, railroad tracks, bridges and buildings

Session Organizers:

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