

6. Energy Harvesting Enabled Rotational Machine Data Analytics and Fault Diagnosis

Introduction: Rotational machines are essential components in various industrial processes, ranging from manufacturing to energy production. Ensuring optimal performance and safety of these machines is crucial. Self-powered sensors and effective fault diagnosis techniques play a pivotal role in achieving this goal. This special session aims to bring together researchers, engineers, and practitioners from academia and industry to explore latest advancements in sensor design and fault diagnosis techniques powered by motions for rotational machines.

Topics:

- *Energy Harvesting Sensors:* Present and discuss innovative self-powered sensor designs that harness the rotational energy of machines for data collection.
- *Sensor Integration:* Explore the integration of self-powered sensors into different types of rotational machines, such as turbines, motors, and generators.
- *Fault Detection and Diagnosis:* Share research on fault detection algorithms and diagnostic methodologies for early identification of issues in rotational machines.
- *Condition Monitoring:* Discuss the real-time condition monitoring systems that utilize self-powered sensors for continuous health assessment.
- *Wireless Communication:* Explore communication protocols and methods for transmitting sensor data wirelessly from self-powered sensors.
- *Data Analytics:* Present data analytics techniques and case studies for interpreting sensor data to predict and prevent machine failures.
- *Energy Efficiency:* Examine how self-powered sensors contribute to overall energy efficiency and sustainability in industrial settings.
- *Case Studies and Applications:* Showcase successful applications of self-powered sensor systems in industries like aerospace, manufacturing, and renewable energy.

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