Skysong Innovations
Advancing the Arizona State University Knowledge Enterprise

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Low-cost System for Testing Motion/Pressure Sensors

In the domain of accelerometer sensitivity measurement, the current standard relies heavily on the utilization of expensive industrial shakers. These shaker devices generate vibrations in a sinusoidal pattern, which, while effective, pose significant limitations. The oscillating motion they produce, moving between high and low points, introduces challenges in consistently applying a uniform acceleration to the sensors under test. Additionally, due to the wired connections between the sensor outputs and acquisition systems, the range of motion within these setups becomes severely constrained.

The complexity and expense involved in constructing such equipment further exacerbate the issue. These current systems excel in high-frequency vibration testing but fall short when it comes to accommodating multiple sensors simultaneously or providing a standardized, controlled acceleration. What is needed is a sensor testing platform capable of delivering a constant acceleration in a controlled manner, that not only mitigates the limitations associated with wired connections but also expands the testing area, allowing for the concurrent evaluation of multiple sensors.

Arizona State University researchers have developed a system for calibrating and measuring the sensitivity of sensors (e.g., accelerometers). This system employs a spinning platform integrated with cutting-edge Wi-fi technology, enabling wireless collection and transmission of testing data. This approach eliminates the need for wired connections, liberating the spinning platform from any motion constraints. By synchronizing controlled accelerations with the platform's speed (e.g., RPM), this technology offers precise calibration. Crucially, its capacity to concurrently test multiple sensors positions it as a simpler and more cost-effective alternative to conventional accelerometer calibrators.

Potential Applications:

- Calibration of sensors (e.g., accelerometers, pressure sensors, motion sensors, etc.) at a large or small scale (e.g., for manufacturing facilities versus lab testing and research)

Benefits and Advantages:

- Enhanced Precision and Control
- Cost-Effectiveness and Simplicity
- Wireless Connectivity and Motion Freedom