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Development of a Real Time Axial Force Measurement System and IoT-Based Monitoring for Smart Bearing

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Abstract : The purpose of this research is to develop a real time axial force measurement system for a smart bearing through the use of strain-gauges, whereby the data acquisition is performed by an Arduino microcontroller due to its easy manipulation and low-cost. The measured signal is acquired and then discretized using a Wheatstone Bridge and an Analog-Digital Converter (ADC) respectively. For bearing monitoring, a real time monitoring system based on Internet of things (IoT) and Bluetooth were developed. Experimental tests were performed on a bearing within a force range up to 600 kN. The experimental results show that there is a proportional linear relationship between the applied force and the output voltage, and the error R squared is within 0.9878 based on the regression analysis.

Keywords : bearing, force measurement, IoT, strain gauge
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