



Ranking of Sensitive Positions using Statistical and Correlational Analysis

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Abstract – Condition Based Monitoring of a machine refers to the checking of various parameters and signatures of the machine and then predicting the machine's current health status. The slight changes in the machine operating condition are carefully analyzed to know if the machine is having any fault. For monitoring the changes, we acquire acoustic data i.e. generated while machine is running. In order to collect acoustic data, a number of sensors are placed near various positions of the machine surface. Acquiring data from large number of sensor positions is not economically viable. It would always be preferable to have a monitoring system that acquires data quickly and efficiently, without compromising on the robustness of the system. Therefore there is a need to locate some special positions on the machine, termed as "sensitive positions", which are expected to exhibit the fault characteristics in a much better way than others. This paper presents a novel method for ranking sensitive positions for a machine based on statistical parameters analysis. While the final list of required number of sensitive positions is generated, the cross-correlation amongst the positions is also taken into consideration to avoid redundancy. Furthermore, a standalone application for implementing the same has been developed on Android platform. The proposed scheme and application can be used for variety of other applications that work on similar principle of acquiring data from multiple sensors.

Index terms – Condition Based Monitoring, Data Acquisition, Sensitive Positions, Statistical Parameters, Android, Sensors