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A REVIEW OF SMART SYSTEMS FOR HEALTH MONITORING OF INDUSTRIAL MOTOR

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ABSTRACT
Today's life electrical machine play an important role in industry as well as in residential area,But due to the electrical crises electricity problem increases day to day life.Because of that problem electrical machine failure chancesisincrease,that affecteconomic growth of the industry as well as residency.That mean directly affect growth of country. For that purpose we require to take some action or find some remedies over this problem. By using Artificial Neural Network Control (ANNC) which will take care of all the test analysis need for safety standards (vibration, torque, voltage, current, power consumption bearing test and etc.,) of a AC/DCdevices with its own training and testing principle of operation. Recently, Artificial Neural Network (ANN) has gained momentum as a controller for nonlinear systems. The complete test system is modeled in Matlab / Simulink. The test results have been analyzed for both steady state and dynamic conditions. It is evident from the results that the proposed ANN controller gives promising results than the PI, PID control.

INTRODUCTION
In motor protection there aredifferent problem included,Using of integrated circuits without CPU produce the motor fault detector, although the current overrun and lack phase fault can be judged, current increase mainly as a criterion, the protection of the principle of a rough, the actual motor failure are the time and ambient temperature function of the electrical current., causing the accident. At the same time, fault conditions cannot store data recordsand cannot be set in accordance with the actual load current, therefore not accurate, reliable and without visual convenience when used, is not conducive to the exclusion of failure, often refusing to move, severe burning motor. With the digital computer, electronic technology, the rapid development of integrated circuits, computer monitoring and control system to replace the traditional monitoring. The focus in most industry is shifting from scheduled maintenance to the predictive maintenance by constantly observing and predicting the machine condition in advance. Most industrial motors are being monitored which either provide warning signals or shut down the system before any catastrophic failure occurs. Though they are able to prevent permanent damage to the machine, they can neither predict the usable life of the equipment nor provide the severity level of the problem. This resulted in the need of an advance system called Cost effective wireless health monitoring system.
Faults in electrical machines are classified in four ways

1) Stator faults resulted due to shorting of opening one or more stator phase windings.
2) Improper connection of the stator windings.
3) Cracked end rings
4) Broken rotor bars.
broken rotor bar or cracked rotor end-rings;

METHODOLOGY
Motor Protection system from over voltage, under voltage and overheating proper running of motor expands its lifetime and also efficiency. Generally, these faults occur when supply system is violating its rating. When the motor is running at rated current, load and voltage then these faults will not be generated. Generally, the smooth running of the motor can be depends on the supply voltage under the set limit & load which is determined by the motor should also be under the stated limit.In this paper, author has discussed the sensor system used to monitoring the mechanical parts. Sensor system used to store the performance of the mechanical parts is wired or wireless. Several advantages are using the wired sensor systems [1].

Transmitting data with very high bandwidth and high sampling rate also possible. It is impossible to measure movable rotating parts. Wireless sensors having lot of benefit in the location of sensing and installation is unrestricted.Sowe focused on using wireless sensor system used to monitoring mechanical wear out parts. Hao and Bergmann [2] designed a wireless sensor system to log the operating signals of vibration, temperature, load and speed of the induction motor. In this paper mainly focused on neural networks to perform on sensor feature extraction and fault diagnosis. This approach used to reduce the amount of data transmitted over the wireless network it's compared with transmitting raw data signals of motor machinery. Another approach [3] installed Zigbee wireless module and sensing component of machinery parts. Another study discussed [4] wireless sensor system based industrial environment and using dynamic power management technique to identify the remaining life time of the systems. Another approach [5] focused on radio. Frequency Identification (RFID) based technology to transmit data with a low sample rate. Final method [6] using frequency hopping spread spectrum with Bluetooth to avoid wireless interference. The data are transmitted to audio signal (i.e. Bluetooth earphone) using best effort approach but does not provide guarantee to data integrity and receiver side correctness. Recently proposed many wireless sensor system designs does not discussed about the wireless communication quality. For that reason, all suffer from wireless interference and data loss is possible for existing system design. In building simultaneous multiple wireless sensor communication could be worsened. To provide guarantee of all the measured data can be transferred from the wireless sensor to the data server. The data transmission purpose the integrate reliable communication protocol then it store all the transmitted data in the permanent storage if it lost means again it retransmitted the data.

LITERATURE REVIEW

Till the last decade, traditionally motor current signature analysis is been used. Many references provides a good and tactical implementation of motor current signature analysis technique. In general fast Fourier transform technique is been used to analyze the frequency spectrum to line current broken bar faults, stator faults and faults related to dynamic eccentricity. If fast fourier transform is used for higher order spectrum (e.g. bispectrum and trispectrum) analysis of dynamic eccentricity will be easy. In many cased DC motor is been tested for both conditions rectifier driven and output of DC generator is fed to it. Artificial neural network (ANNs), fuzzy, neuro, or hybrid combination of neuro fuzzy have been used in various application for condition monitoring of speed, torque, voltage, current and vibration abnormality in both ac and dc machines. Most probably they find the used in AC machines, this machines are also applicable when relationship between motor current are nonlinear. The artificial techniques can be used for making an decision to improve motor current signature analysis results of condition monitoring and various fault detection in machines.

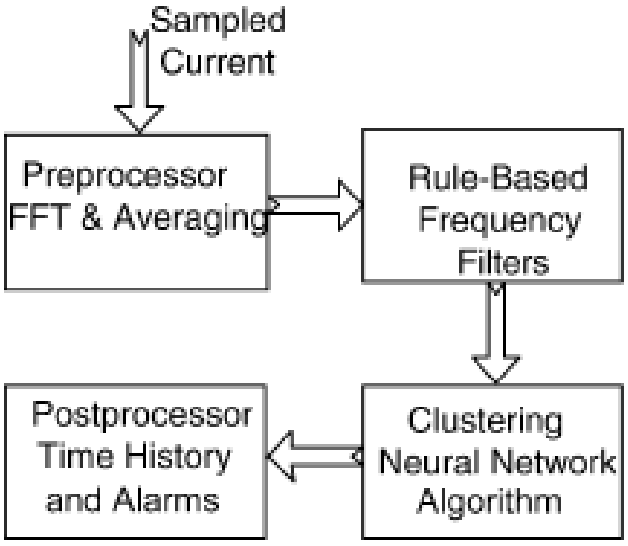

Fig.1. Block Diagram of ANN based fault diagnosis

Artificial neural network base fault diagnosis system is presented in fig.1. The preprocessor block takes extracts of frequency components of obtained sampled data. Artificial neural network while extracting the data uses rule based to form the frequency filters. To categorize frequency filters four sub classification is made based on reducing level of importance. Using all this category all this neural network is been trained for all possible conditions of operations and it is also used for classifying the data. The spectral signature which takes care of data falling outside the trained clusters are being noted and they are treated for faults. To reduce the fault diagnosis post processor sends an alarm only when signatures are noticed persistently. To perform this function is necessary to maintain the all time history for being overall motor is being monitored, this type of system are observed in many of the literature that author come across. In few of the references prediction of fault by using neural network does not require any information related to the any of the machine parameter or even the information of the speed. The prediction of speed is done from measured terminal voltage and current. All electrical motors of different sizes can have condition monitoring based on controller rule of neural network. As per the literature neural network can have 93% correct fault prediction.

CONCLUSION

Byvariousfault condition analysis of the motor protection and using of mathematical models andsimulate the process of motor temperature. Full advantageof the single-chip system resources realize intelligent motorprotection and form a fully functional, practical monitoring system with a small number of Peripheral devices.Achieve a variety of motor fault general protection, as well as monitoring the operation of the motor. By testing the various parts of the hardware, the system can achieve the required accuracy of the monitoring, stable Operation, the use of effective, are in line with the target-site requirements to ensure reliable operation of the system, the promote a certain value.

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