

## IMPLEMENTATION OF ARTIFICIAL INTELLIGENCE FOR DIAGNOSIS OF THE FAULTS OF MOTOR-FAN SYSTEM

*Maha M. A. Lashin<sup>1</sup> & Areej A. Malibari<sup>2</sup>*

*<sup>1</sup>Associated Professor, College of Engineering, Princess NourahBintAbdulrahman University, Saudi Arabia  
On Leave from Mechanical Engineering Department, Faculty of Engineering Shoubra, Banha University, Egypt*

*<sup>2</sup>Associated Professor, Department of Computer Science, Faculty of Computing and Information Technology, King  
Abdulaziz University, Saudi Arabia*

**Received: 06 Oct 2019**

**Accepted: 21 Oct 2019**

**Published: 31 Oct 2019**

### **ABSTRACT**

*Reliable diagnostic methodologies for motor-fan system need to cost effective based maintenance. Several techniques are currently available to fault diagnosis. Some of these techniques cannot determine the fault type quickly and accurately as required. Thus, there is an essential need to use new techniques to achieve quick, easy and highly reliable decisions. Artificial intelligence increasingly used in fault diagnosis systems. In this paper Neural Networks, Fuzzy Logic System, Neuro-Fuzzy System and Adaptive Neuro-Fuzzy Inference used as new artificial intelligence techniques to develop automated fault classification tools. Neural networks classifiers used for discriminant faults spectra based on batch training techniques. Fuzzy logic system identifiers used for adding a logical nature to the fault detection process. Fuzzy logic application extended to hybrid neuro-fuzzy system with greater accuracy due to parallel processing of data both numerical and logically. Finally, adaptive neuro-fuzzy inference system technique adding a logical nature to the fault detection process.*

**KEYWORDS:** *Motor-Fan System, Neural Network, Fuzzy Logic System, Neuro-Fuzzy System, Adaptive Neuro-Fuzzy Inference System*