Abstract

This paper describes a fault identification technique for mechanical system which is based on genetic algorithm using training set. The real-world application of Genetic Algorithm (GA) to the key of engineering problem becomes a rapidly emerging approach in the field of control engineering and signal processing. Genetic algorithms are convenient for searching a space in multi-directional way from large spaces and poorly defined space. In this paper Genetic Algorithm is used to identify and evaluate the fault cases. Several methods are employed in the state of art in fault identification. Here one class of efficient method are investigated which is based on optimization technique. Here it is shown that Genetic Algorithm can be used to select smaller subset of features from the large set which together form a new set that can be successful for fault identification and classification tasks. The performance of this present proposed method has been verified through two types of fitness function, namely, square function and polynomial function. Finally, fault detection exercises are performed based on the training set to verify the feasibility of this proposed method. Experimental results show that the fault is distinguished with a high precision through this present work.
Automatic Fault Identification of a Mechanical System using Genetic Algorithm

References

- Chou, J. H. and Ghaboussi, J., "Genetic Algorithm in Structural Damage
Automatic Fault Identification of a Mechanical System using Genetic Algorithm

  Representation Genetic Algorithm for Structural Damage Detection in Noisy
  2418-2419, 2003
- Mares, C. and Surace, C., "An application of genetic algorithms to identify
- Mehul A. Shah, Joseph M. Hellerstein, Eric Brewer, "Highly Available,
- Klaus Echtle, Irence Eusgeld, "A Genetic Algorithm for Fault-Tolerant System
- Abhinav Saxena, Ashraf Saad, "Genetic Algorithms for Artificial Neural Net-based
  Condition Monitoring System Design for Rotating Mechanical Systems",

Index Terms

Computer Science
Artificial Intelligence

Keywords
Genetic Algorithm  Fault identification  Optimization  Fitness Function  Training set.