عنوان مقاله:

Intelligent Determining Amount of Inter-Turn Stator Winding Fault in Permanent Magnet Synchronous Motor Using an Artificial Neural Network Trained by Improved Gravitational Search Algorithm

محل انتشار:

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نویسندگان:

Mehran Taghipour-gorjikolaie - *Deptment of Electronic Engineering, Faculty of Electrical and Computer Engineering, University of Birjand, Birjand, Iran*

Seyyed Mohammad Rezavi - *Deptment of Electronic Engineering, Faculty of Electrical and Computer Engineering, University of Birjand, Birjand, Iran*

Mohammad Ali ShamiNejad - *Deptment of Power Engineering, Faculty of Electrical and Computer Engineering, University of Birjand, Birjand, Iran*

خلاصه مقاله:

Extension of inter-turn fault in windings of PMSM can damage all parts of electrical systems, and in some cases in sensitive applications may lead to irreparable events. Identification of such small faults at incipient steps can be so helpful to protect entire part of electrical system. In this paper, intelligent protection system is designed which is made by two major parts. In the first part of intelligent protection system K-Nearest Neighbor classifier is used as a detecting system to discriminate inter-turn fault from normal condition, phase to phase fault and open circuit condition and also to detect faulty phase, simultaneity. After that if inter-turn fault is happened, second part of proposed system which is based on an ANN Trained with Improved Gravitational Search Algorithm determines the amount of fault. IGSA is presented to improve the performance of the proposed protection system in this paper. Obtained results show that both part of intelligent proposed and intelligent protection system can do their best performance. It can successfully detect inter-turn fault and follow it and predict amount of this fault.

کلمات کلیدی:

population optimization algorithm, gravitational search algorithm, RMS value of current, negative sequence current, inter-turn stator winding fault, permanent magnet synchronous motor