

Observer-based Robust Diagnosis for Wind Turbine System

Authors : Sarah Odofin, Zhiwei Gao

Abstract : Operations and maintenance of wind turbine have received much attention by researcher due to rapid expansion of wind farms. This paper explores a novel fault diagnosis that is designed and optimized to be very sensitive to faults and robust to disturbances. The faults considered are the sensor faults of which the augmented observer is considered to enlarge faults and to be robust to disturbance. A qualitative model based analysis is proposed for early fault diagnosis to minimize downtime mostly caused by components breakdown and exploit productivity. Simulation results are computed validating the models provided which demonstrates system performance using practical application of fault type examples. The results demonstrate the effectiveness of the developed techniques investigated in a Matlab/Simulink environment.

Keywords : wind turbine, condition monitoring, genetic algorithm, fault diagnosis, augmented observer, disturbance robustness, fault estimation, sensor monitoring

Conference Title : ICPEEE 2015 : International Conference on Power, Energy and Electrical Engineering

Conference Location : Istanbul, Türkiye

Conference Dates : January 26-27, 2015