TUNING OF PID CONTROLLER TO CONTROL TURBINE SPEED USING GENETIC ALGORITHM

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Abstract

It is known that PID controller is employed in every facet of industrial automation. The application of PID controller span from small industry to high technology industry. In this paper, it is proposed that the controller be tuned using the Genetic Algorithm technique. Genetic Algorithms (GAs) are a stochastic global search method that emulates the process of natural evolution. Genetic Algorithms have been shown to be capable of locating high performance areas in complex domains without experiencing the difficulties associated with high dimensionality or false optima as may occur with gradient decent techniques. Using genetic algorithms to perform the tuning of the controller will result in the optimum controller being evaluated for the system every time. For this study, the model selected is of turbine speed control system. The reason for this is that this model is often encountered in refineries in a form of steam turbine that uses hydraulic governor to control the speed of the turbine. The PID controller of the model will be designed using the classical method and the results analyzed. The same model will be redesigned using the GA method. The results of both designs will be compared, analyzed and conclusion will be drawn out of the simulation made.

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