

Fuzzy-Pi Speed Controller for High Performance of Multi-Motor Drive System

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Abstract: The paper proposes mathematical modeling and simulation of a system of multi-electrical machines which can be controlled independently from a controller, this will help saving energy by reducing the number of controllers as well as power supplies for industrial power electronic control systems. In order to archive this independent multi-control, traditional control methods and machines can not be used. Number of phases in each machine has to be higher than three, the number of machines simultaneously controlled by one multi-phase inverter is increased with higher number of phases of machines, and this concept is applied to two five-phase induction machines in this particular paper. A transposition of phase connection is carried out to enable two five-phase electrical machines connected in series to be controlled independently from a controller and a five-phase inverter. Application of fuzzy-PI controller for high performance of variable speed operations is implemented to improve the accuracy, robustness, and reliability of speed responses of the multi-drive system.

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