

In this paper, we propose a procedure to design an optimal fuzzy controller for indirect field oriented controlled induction machine drives. This controller has best possible performances with a minimum action time possible in a practical implementation. First, we design a fuzzy PI controller having the maximum of fuzzy sets (7 input/output membership functions), which show better static and dynamic performances. This controller is specific to speed close loop of an indirect field oriented induction machine drive. Then, in order to minimize its composition the ANFIS (Adaptive Network-Based Fuzzy Inference System) structure is applied to perform a structural and parametric optimization of this controller. We propose also, a procedure to reproduce the input/output mapping of this controller with an approximation using artificial neural networks (ANN)