An implementation of brain emotional learning based intelligent Controller for AVR system

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ABSTRACT

In this paper, an intelligent controller based on brain emotional learning called BELBIC is applied and optimized by Particle Swarm optimization algorithm. PSO algorithm is used to tuned twelve BELBIC controller parameters in order to improve the time domain parameters such as overshoot percentage (OS%), rise time (tr), settling time (ts) and steady state error (Ess) of the step response for an AVR system in order to minimize value of objective function based on ZLG method. This proposed PSO-BELBIC controller time domain parameters performance is compared with the PSO-PID, IKA-PID and SCA-PID controller. From the simulation, the proposed model free PSO-BELBIC controller was confirm able to provide the best objective function minimization value. This proposed PSO-BELBIC controller also able to provide superior performance to reduce overshoot percentage, steady state error and settling time compared to others controller. However, this proposed controller still have a space to improve its rising time parameter by investigate new formulation of Si and ES for BELBIC controller.

KEYWORDS

AVR system; BELBIC controller; Emotional learning; Particle Swarm optimization

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