PERFORMANCE OF RBF NEURAL CONTROLLER FOR TRANSIENT STABILITY ENHANCEMENT OF POWER SYSTEM

T. Atanasova, ICSR; J. Zaprianov, ICSR

One of the promising applications of NN in PS is in the area of power stabilization. Neural network based power system stabilizers (PSS) are shown very effective in damping out the PS lower frequency oscillations and experimentally are shown to have much better performance over a conventional PSS. Another important applications of NN controller is for transient stability enhancement. This is a subject of this paper. To enhance first swing stability a RBF neural network fastvalving controller is proposed. The solution approach is based on a recent fuzzy fastvalving control scheme (Babu et al., 1997). But the fuzzy logic control suffers from the disadvantage of having to obtain fuzzy rules by trial and error and the requirement of good knowledge of the system behavior. The learning capabilities of NN are used to overcome this problems. RBF neural structure is selected as closely related with fuzzy logic approach. The objective of the fastvalving is to modulate the mechanical power input by suitable changing of the valve position. Thus the output of the RBF NN controller is the change in valve position. The inputs are the speed error and the variation in the electric power. The design steps of proposed RBF neural controller are explained. Disturbances in PS are used for training the NN controller. The performance of the RBF neural controller is simulated in a single machine to an infinitive bus power system.