

Abstract

An improved self-tuning mechanism of fuzzy control by gradient descent method is presented. The membership function parameters are tuned by minimizing some criterion defined on the control output using the steepest gradient descent algorithm. The factor which controls how much the fuzzy controller parameters are altered is adjusted continuously using a set of fuzzy rules. This varying factor is determined with respect to the values of the objective function and its change. An application to the control output optimization of a PI-type fuzzy controller shows the superiority of the proposed self-tuning mechanism over a previously published approach in terms of both precision and convergence rate