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of

Implementation of a New Self-Tuning Fuzzy PID Controller on PLC

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Abstract: In this study, the self-tuning method for fuzzy PID controllers that has been developed in a previous study of the authors is implemented on PLC in order to control some standard processes formed on FEEDBACK PCS 327 Process Control Simulator. In this tuning method, the input scaling factor corresponding to the derivative coefficient and the output scaling factor corresponding to the integral coefficient of the fuzzy PID controller are adjusted using a fuzzy inference mechanism with a new input called "normalized acceleration". The results of the implementation have been compared with those of the classical fuzzy PID controller without a tuning mechanism and it has been observed that the tuning mechanism decreases the oscillations and the settling time while providing smoother system responses also in real time application.

Key Words: Fuzzy PID controllers; relative rate observer; self-tuning mechanisms; Programmable Logic Controllers

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