

# Control of Linear Electric Actuator with Hybrid Fuzzy PID Controller

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## Abstract

In this study, the actuator, which converts circular motion to linear motion, is controlled with a smart hybrid controller. The model includes the analysis of electrical and mechanical parts. The controller, on the other hand, has a design methodology that cleverly blends classical PID and fuzzy controllers. In this design methodology, classical PID and fuzzy controller have an error parameter dependent blending mechanism. In order to compare the performance of the hybrid controller, the coefficients of the classical PI and PID controllers were obtained by methods such as Ziegler-Nichols, Skogestad IMC, Chien-Hrones-Reswick and the coefficients with the best response were used. For performance comparison of conventional controllers and hybrid controller; rise time, settling time, max. overshoot and IAE, ITAE values are used. It has been observed that the hybrid controller performs better on most evaluation criteria.

**Keywords:** fuzzy logic, hybrid controller, linear motor, performance indexes, speed and position control