

# Optimal Neural-fuzzy Approach for Current/voltage-controlled Electromagnetic Suspension System

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## ABSTRACT

In this article, the electromagnetic suspension system is modeled as a neural-based T-S fuzzy system, and then the optimal fuzzy control design scheme is proposed to control the current and voltage-controlled system with minimum current and voltage consumption, respectively. The proposed self-constructing neural fuzzy inference network is a six layer neural network (SONFIN) modified from the well-known SONFIN network, which can construct a linear T-S fuzzy model and affine T-S fuzzy model of the system just by the input and output (I/O) information. Based on the T-S model, we can construct the optimal fuzzy control scheme to efficiently regulate the highly nonlinear, complex and uncertain electromagnetic suspension system to the equilibrium state.

Keywords: SONFIN, electromagnetic suspension system, optimal fuzzy control

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