Single input fuzzy logic controller for magnetic levitation system

Abstract:

Fuzzy logic controller (FLC) is an attractive alternative to existing classical or modern controllers for designing the challenging Non-linear control systems. However conventional FLC (CFLC) performance is greatly dependent on its inference rules. In most cases, the more rules being applied to a FLC, the accuracy of the control action is enhanced at the expense of longer computational time. As a result, FLC implementation requires fast and high performance processors. In this paper, it is shown that the inference rule table of a two-input FLCs used to control a magnetic levitation system can be reduced to a Single Input Fuzzy Logic Controller (SIFLC), which can be easily implemented using a lookup table. Simulated results are presented to demonstrate the equivalency of SIFLC and CFLC.