Reduction in Space Complexity and Error Detection/Correction of a Fuzzy controller

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Abstract

Fuzzy controllers prove to be very useful for practical applications, especially in the cases when there is no appropriate mathematical model of behavior of the controlled object. Control signal is computed by fuzzy controller with the use of rule base table. In this paper we propose a mathematical method for reduction in space complexity of the system by decreasing the number of address lines in the memory used to store If-Then rules. The idea of the method is to use variable radix in representing integers. We also propose incorporation of error-correcting codes in the memory used to store If-then rules without substantial increasing of space complexity and application of signature analysis for error detection/location in a fuzzy controller.