Abstract

Fuzzy specific hardware systems, or the adaptation of standard embedded controllers, are the common approaches for real-time fuzzy logic implementation. High speed applications may require the more sophisticated hardware, but most embedded control applications do not have the high speed processing requirements that necessitate the cost prohibitive enhanced hardware. A review of embedded control fuzzy logic applications indicates a preference for 16-bit architectures; devoting significant processing resources for fuzzification, rule application, and defuzzification. While faithful to the foundations of fuzzy logic control, processor demand can limit a controller's ability to handle peripheral I/O interfaces. This paper describes a generic, hybrid approach suitable for unenhanced 8-bit microcontrollers and adaptable to most single input, single output systems. A motor speed application with real-time I/O interface provides proof of concept performance data and highlights limitations.