

ABSTRACT

This work investigates the implementation of fuzzy systems using electronic currents. Such systems have been used before to solve several of problems of engineering applications, mainly involving process control applications. On more complex applications, the approximate reasoning of the fuzzy logic allows a way to understand the system behavior, allowing approximate interpolation among observed sets of input and output points. The implementation of a fuzzy system can be based in hardware, software or both. Typically, the software implementation uses a programming environment integrated with simulation, helping the designing work. The hardware implementations, traditional or evolutionary, can be analog or digital, mainly for high performance systems. This work aims to research an electronic implementation of a fuzzy system, capable to accomplish an adequate input to output mapping. The focus of this work is to design a platform with an analog-digital architecture based in a mapping table stored in a high capacity memory. Memories of the SD (Secure Digital) type were studied and used in the construction of a prototype of the electronic platform. Also studies were developed on the quantization, specifically to allow the reduction of the number of bits. With the accomplished implementation, it is possible to develop a fuzzy system in a simulated environment (Matlab), to configure the platform and to execute the fuzzy system directly in the electronic platform. The tests with the prototype was successful.

Keywords: Systems fuzzy, electronic implementation, microcontroller platform, memory card SD, interface USB.