A Real-time Multi-tasking System-on-Chip in Robot Control

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ABSTRACT

A system-on-chip embedded with real-time multi-tasking control programs could be applied to many applications such as the control of aviation flight, car engine, missile system, and robot. This study implements a 32-b RISC micro-processor by using algorithmic state machine (ASM) and Verilog hardware description language. A real-time multi-tasking control program is carried out by using the designed instruction set for robot control. Some digital circuits for robot interface are performed by using Verilog hardware description language. The overall design is simulated by using SynaptiCAD, programmed to FPGA chip by using Xilinx ISE, and validated by real-time multi-tasking control of a robot.

Keywords : Robot Control, System-on-Chip, RISC micro-controller, ASM, Verilog,FPGA

Table of Contents

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