An Interface Design of the ARM Bus
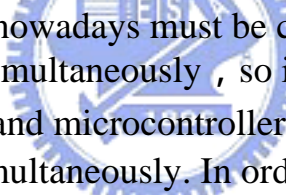
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## ABSTRACT

　　　　Many applications nowadays must be combined the function of microcontroller and DSP simultaneously　so it is a very important topic to combine the two IP , DSP and microcontroller ,in SoC system to process the control and signal work simultaneously. In order to maintain the high efficiency of DSP　this thesis will use higher clock cycle time of DSP than that of system to promote operating rate and achieve the goal of acceleration.

　　　　In this thesis　we choose the DR8051 as our microcontroller and the ADSP2188 as our DSP. We also choose the architecture and protocol of AMBA which ARM Corporation proposed to integrate DSP and microcontroller　In order to build a basic SoC system　We not only design the microcontroller wrapper and the DSP wrapper in AMBA protocol　but also design DMA SDRAM controller and some basic units in AMBA　Arbiter　Decoder and Bridge ,etc. Finally, by using microcontroller, we can control the DSP to execute a DFT program and monitor the result through the microcontroller.

　　　　This architecture is accomplished by Hardware Description Language VHDL. The whole system is realized by Xilinx Corporation Virtex　xc2v6000 FPGA. The clock cycle time of system can reach 48MHZ　The clock cycle time of DSP can reach 75MHZ.