

IMPLEMENTATION OF A MICROBLAZE BASED EMBEDDED SYSTEM FOR DISPLAYING INFORMATION

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Abstract

In recent years, embedded systems have gotten more and more popular and played an important role in life. It is not difficult to list embedded systems around us, from the simple and small devices such as handheld calculator, MP3 players, domestic devices,... to the complex systems as automatic industrial control machines, military control systems, healthcare smart systems, etc... Embedded system has really contributed to life make more civilized.

An embedded system is defined as a system with a specific function for the purposes of controlling, monitoring or assisting the operation of equipment, machinery or plant within a larger system. "Embedded" reflects the fact that they are an integral part of the system.

FPGA (Field Programmable Gate Array) technology is becoming more common in embedded design. Embedding a processor inside an FPGA has many advantages. Internal specific memory, processor busses, internal peripherals, and external peripheral controllers (including external memory controllers) can be chosen or constructed based on the application, with unique user-designed peripherals being easily attached.

An FPGA embedded processor system offers many exceptional advantages compared to typical microprocessors including:

- 1) Customization
- 2) Obsolescence mitigation
- 3) Component and cost reduction
- 4) Hardware acceleration

As you know, embedded system can be used for many applications, one of which is displaying information. Actually, displaying information on the monitor was a very common problem and there were also many applications and products relating to this. However, I really want to rebuild this problem basing on FPGA technology as a new approach. Approved by supervisor, I choose "Implementation of MicroBlaze based Embedded System for Displaying Information" as my thesis title.

The system which I implemented is built on Spartan 3E Starter Kit. This is an FPGA platform of Xilinx company which user can develop certain embedded system. Beside of the great characteristics as flexible, highly configurable, another reason why I choose FPGA is I want to research about applications on FPGA which is developing in currently to serve my work in the near future.

Keywords: Embedded system, FPGA technology, displaying information, Spartan 3E Starter Kit.