A Study of FPGA-based System-on-Chip Designs for Real-Time Industrial Application

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Authors:
Ali Al-Mahmood, Michael Opoku Agyeman

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Abstract

This paper shows the benefits of the Field Programming Gate Array (FPGAs) in industrial control applications. The author starts by addressing the benefits of FPGA and where it is useful. As well as, the author has done some FPGA’s evaluation researches on the FPGA performing explaining the performance of the FPGA and the design tools. To show the benefits of the FPGA, an industrial application example has been used. The application is a real-time face detection and tracking using FPGA. Face tracking will depend on calculating the centroid of each detected region. A DE2-SoC Altera board has been used to implement this application. The application based on few algorithms that filter the captured images to detect them. These algorithms have been translated to a Verilog code to run it on the DE2-SoC board.

References

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Index Terms

Computer Science  Image Processing

Keywords

FPGA; System-on-Chip(SoC); Real-Time face detection and tracking Application; algorithms; images filtering; Industail control Application; Design Tool.