

Real-Time Image Processing on FPGA

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Abstract

This paper presents the design of a real-time image processing system based on FPGA with a simple, scalable and versatile design. Image processing components are: selectable and editable convolution filters, color lookup table. A PC application downloads image files into the memory that the gate-array accesses. The image is read out from the memory by the FPGA logic and passed through a processing pipeline. The processed image is displayed on the attached VGA monitor and may be uploaded to the PC. For the attached CRT monitor the color gradients can be generated with pulse width modulation. The communication between the PC application and the gate-array logic is performed through high bandwidth offered by USB protocol.