

Embedded Image Capture

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ABSTRACT

Capturing images from a video camera to a memory card in real time is the basis of every modern digital camera. In this project we aim to build a system that does just that using an FPGA. We plan to use video coming from the video port of the board, display to the VGA output and save an image still in JPEG format into a memory card.

DESCRIPTION

For this project we propose to deliver a system that has the ability to save image stills in JPEG format in a memory card in real-time. These images would come from the FPGA video decoder, where we plan to connect a video camera using the standard RCA connector. The video feed will be displayed in the VGA output port of the board and on user input the system will capture the current video frame and save it as a .jpg file in a SD memory card connected to the card reader slot of the board.

CHALLENGES

Our main challenge for this project is to make our system function in real-time. Our goal is to be able to save about one image per second.

PLAN OF ACTION

First we need to purchase a video camera with RCA output that can be connected to the board. Then we plan to display video coming from the camera into the VGA display connected to the board. At the same time we will research how the JPEG compression works and what is the format of today's .jpg files. Then, depending on our research, we will decide whether to implement the JPEG compression in hardware or in software. Finally, we will modify the system in order to save the compressed data into the memory card.

MILESTONES

The first milestone is to display the video input to the VGA output. The second milestone is to compress a video frame in JPEG format. The third milestone is to save the frame to a file in the memory card.

OUR MOTIVATION

We are motivated by the challenge and usefulness of processing video through a FPGA. We are also interested in researching how JPEG works and how we can make the image compression fast enough so that we can use it in a real time system, like the one we propose.