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Project Report on

"REAL-TIME IMPLEMENTATION OF OBJECT TRACKING ON FPGA"

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ABSTRACT

Image processing tasks require speed and adaptability for achieving robustness. Image processing algorithms implemented in hardware have emerged as the most practical solution for improving the performance of image processing systems. The introduction of reconfigurable devices such as FPGAs has further accelerated the design of image processing in hardware.

Real-time image and video processing systems involve processing vast amounts of image data in a timely manner for the purpose of extracting useful information, which could mean anything from obtaining an enhanced image to intelligent scene analysis. Digital images and video are essentially multidimensional signals and are thus quite data intensive, requiring a significant amount of computation and memory resources for their processing.

Object tracking is an important task in the field of computer vision. Using Vision to track and analyze the human behavior is one of the prominent issues in computer science, mainly due to its potential applications. Human detection and human pose recovery are not solved problem yet and they can only work under specific conditions. Once the target has been detected, our objective will be to keep this target under control and this is the job of the tracking algorithms.

Object Tracking Algorithms have been implemented on Xilinx's Spartan 3A DSP Video Starter Kit (VSK) and tested for a resolution of 800 x 600 at 60 fps. This report explains the architecture of the implementations on Field Programmable Gate Arrays (FPGA).

Here, we present the implementation of the above mentioned techniques on the frames of an incoming video on FPGA using System Generator (SysGen), a DSP design tool for algorithm implementation, Embedded Development Kit(EDK) a system level tool and Chipscope Pro, a debugging tool from XILINX.