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Abstract

Edge detection is a method to detect presence of an object's image- typically this is identified by sharp changes in pixel density. We realized Canny Edge Detection Algorithm, the most optimal edge detector, in FPGA hardware utilizing Hardware-Software Co-Simulation with the help of Simulink (Mathworks) and System Generator (Xilinx). We explored and utilized different edge detection operators, in addition to Sobel, which is the typical such operator, for gradient calculation (the primary edge detection process). After comparative analysis, we found both Sobel and Robert operators among the best with hardware realization of Robert operator utilizing less resources (LUT & Flip-Flops). All the different versions of the algorithm was synthesized for Spartan-6 LX16 FPGAs from Xilinx.

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Computer Science

Index Terms

Algorithms

Keywords

Canny Edge Detection Sobel Robert Xilinx System Generator Nexys3- Spartan 6 FPGA Board.

