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Implementation of Edge Detection Based on Autofluorescence Endoscopic Image of Field Programmable Gate Array

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Abstract : Autofluorescence Imaging (AFI) is a technology for detecting early carcinogenesis of the gastrointestinal tract in recent years. Compared with traditional white light endoscopy (WLE), this technology greatly improves the detection accuracy of early carcinogenesis, because the colors of normal tissues are different from cancerous tissues. Thus, edge detection can distinguish them in grayscale images. In this paper, based on the traditional Sobel edge detection method, optimization has been performed on this method which considers the environment of the gastrointestinal, including adaptive threshold and morphological processing. All of the processes are implemented on our self-designed system based on the image sensor OV6930 and Field Programmable Gate Array (FPGA), The system can capture the gastrointestinal image taken by the lens in real time and detect edges. The final experiments verified the feasibility of our system and the effectiveness and accuracy of the edge detection algorithm.

Keywords : AFI, edge detection, adaptive threshold, morphological processing, OV6930, FPGA
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