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Abstract
In this dissertation, our research goal is to design and realize a target-tracking system by using a real-time stereo vision. In early days, the stereo vision object-tracking system was based on a personal computer with an image processing method, but the system could not have the function for processing images immediately. In our research, the stereo vision object-tracking system cooperates with Field Programmable Gate Array (FPGA) of ALTERA and hardware circuits to attain the stereo vision design for eyes and the proofing work. Besides, the controlling chip also can be applied on a control system of a platform of an automatic vehicle practically. Based on the design of the omni-wheel and the machine platform frame, the controlling chip can calculate and output an appropriate pulse width modulation (PWM) controlling signal for controlling the rotating speed and the rotating direction of two sets of DC motors according to the direction and the distance between the controlling chip and the object, so that the platform of the automatic vehicle can lock up the moving direction of the object and trace the distance of the object. Therefore, the design of the target-tracking system with the real-time stereo vision system and the proofing work can be realized by the rapid prototype system and the proofing function of the FPGA for allowing automatic vehicles to have the visional perception.
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