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Abstract
This thesis proposes design concepts of an intelligent vision-based shopping assistant robot. By using such robot, a shop or store could not only save human resources effectively but also improve the quality of information service. In general, a store always provides several kinds of nice services as guidance, communication, and accompanying. In this thesis, a fuzzy guiding controller and a fuzzy following controller are proposed for the guidance and accompanying services respectively. Since the intelligent vision-based shopping assistant robot utilizes continuous images from the fixed angle of depression to determine the environmental information of navigation for guiding and accompanying services. For collision-free controls, the robot on one hand moves based on the information of guiding lines, and on the other hand, a “warning area” planed in the passage is used to check whether obstacle avoidance controls should be started. The system adopts color recognition and size filter methods to search for proper eigenblocks and their relative locations. In which, eigenblocks maybe the image blocks of a customer’s shoes or some specified objects. Sending such information to the fuzzy following controller, the robot will accomplish the motion control of following the specified customer. Besides, passive RFID modules and tags are used to construct the robotic localization system. The experimental results show the feasibility of proposed robotic systems in this thesis.
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