URN etd-0407109-183706-395
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Statistics This thesis had been viewed 56 times. Download 0 times.
Department
Year 2003
Semester 2
Degree Master
Type of Document Master's Thesis
Language zh-TW.Big5 Chinese
Title Design and Implementation of an Intelligent Shopping Service Robot
Date of Defense 0000-00-00
Page Count 58
Keyword
Intelligent Shopping Service Robot
Mobile Robot
Image Vision System
Navigation Control
Obstacle Avoidance

Abstract
The thesis presents the idea of designing an intelligent shopping service robot (ISSR). The ISSR is framed by integrating servo control, image processing, vision servo, wireless communication, remote internet control and intelligent information decision making control techniques. Besides, involving parcel express services and online secure exchange services as auxiliaries of the ISSR, the ISSR system will realize the dream of shopping in faraway places. In this thesis, the basic construction design of the ISSR, which contains the mechanism, servo-movement, image devices, ultrasonic sensor devices, transducers and their modules is proposed. The navigation strategy of the robot merges two distinct situations. The global navigation control is to plan the travel path according to the tasks assigned to the ISSR. The local navigation control consists of two stages, the obstacle avoidance stage and the guiding control stage. The obstacle avoidance stage is based on visual feedback and ultrasonic sensory information to detect obstacles. In which, an integrated fuzzy controller is designed to offer a smoother navigation. The guiding control stage is aimed to avoid the robot travelling adrift in the supermarket. The ISSR has been implemented with numerous functions such that autonomous mobile, obstacle avoidance, and remote vision. Finally, simulation and experiment results demonstrate the feasibility and effectiveness of the proposed schemes.
Advisory Committee Yuan-Ming Shieh - advisor

Files No Any Full Text File.
Date of Submission 2004-07-12