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Author Cheng-Ning Lu
Author's Email Address No Public.
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Abstract
This thesis addresses the design and implementation of an intelligent interactive home robot based on multi-sensory systems. In order to accomplish basic home services, the robot is designed to have the functions of environmental map construction, autonomous navigation, collision-free control, and human-robot interaction. For environmental sensing and object tracking, a series of image features recognition procedures are used to establish the database of objective images. By integrating image information of objectives and ground lines, the robot can determine the relative localities of specific objectives and then perform environmental map construction and robot localization. Moreover, the user can also control the robot remotely to navigate and construct the environmental map through the interaction website. Besides, in order to let the robot adapt to various environments, there are fuzzy long and short range obstacle avoidance control systems designed in the robot to avoid collision and/or downfall whenever it performs navigation or tracking. By combining these sensory and image recognition functions, the proposed robot really has the rudiments of vision, multi-sensing and interactive integration. The experimental results demonstrate the environmental adaptability of the robot; these also show such kind of robot can provide plentiful home entertainments.
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