

結合無線感測網路之機器人召喚系統設計 A Call-to-Service Design for Mobile Robots Using Wireless Sensor Network

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In this thesis, a call-to-service system for mobile robots is developed based on a wireless sensor network. In this design, a ZigBee-based location-aware system is responsible for estimating the position of user who calls the robot for service. The autonomous navigation system takes the location information as goal position and guides the robot moving toward to the user upon calling. While the accuracy of the ZigBee-based location-aware system is limited, the robot uses Kinect to detect user's body and face to find the exact position of the user when the robot approaches the user. A visual tracking controller guides the robot to move toward to the user upon calling, and track the user in front of him/her by a set distance. For navigation control, we propose a self-localization system of a mobile robot by fusing the ZigBee-based location-aware system and odometer to improve the localization accuracy. Experimental results show that the average localization error is 68 cm in a 60 m travel. Experimental results also verified the effectiveness of finding the user upon calling at various distances and locations.

