

Ceilbot Development and Integration

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Abstract:

The mobile robots that are present today are struggling to deal with challenges related to localization, power supply, mobility in the real world with all sorts of obstacles and other issues. At the same time, the demand for service robots for domestic applications has been growing and predictions show that the demand will continue to grow in the future. To meet the demands and to fulfill the expectations, those challenges need to be addressed.

This thesis presents the development of a ceiling mounted robot known as Ceilbot. It is a type of mobile service robot except that it works on a track attached to the ceiling. This implies that the robot operates in a structured environment with continuous power supply simplifying some of the issues mentioned above.

The development of the Ceilbot includes a simplified DC motor controller development, object recognition development and an easy-to-use graphical user interface design. The developed motor controller provides flexibility for the user to change the control parameters and produces deterministic output with high repeatability when compared to a regular proportional and integral (PI) controller. The designed user interface simplifies the interaction between the user and the Ceilbot by allowing the user to send commands to the Ceilbot and displaying some status parameters for monitoring.

In order to have a complete robot system for demonstration purposes, a simple manipulator using two servomotors is also developed.

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