

ROBOT METHODS FOR HUMAN-ROBOT SPATIAL LANGUAGE INTERACTION

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ABSTRACT

This thesis talks about a work to design a robot with some to interact with human by spatial language.

The robot is a differential drive robot with Kinect camera.

The thesis proposes the perception methods which include furniture recognition, furniture orientation detection and robot reposition for recognition performance improvement. The perception uses RGB-Depth image and extracts furniture samples and recognize them by using linguistic model and probability model. A novel method is designed for furniture position and orientation detection. The thesis also shows a method of using robot reposition to improve the recognition performance.

The thesis also talks on human robot interaction. It gives a model which can convert human natural spatial language to robot navigation instructions.

Several experiments in both physical world and simulation are run to test the efficiency of these algorithms.