Project Abstract Form (Faculty of Engineering - Spring 2024 berlin)

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Supervisor's Name(s):

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Project Title: TurtleBot3 Maze Navigation

Abstract (250 Words)

This project aims to develop a series of functionalities for a TurtleBot3 Waffle navigating through a user-defined maze environment. The project will be conducted in four versions, progressively increasing the complexity of the robot's navigation capabilities. Version 1 involves capturing an image of the maze, converting it into a map using image processing techniques, and utilizing ROS to send the map to the TurtleBot3 for navigation. Version 2 enhances Version 1 by incorporating path planning within the ROS framework, analyzing the map, and generating an optimal path for the robot to traverse the maze. Version 3 implements real-time obstacle detection and path planning, where the robot utilizes sensors to continuously track its surroundings and adjust its path in response to detected obstacles. Version 4 (Additional) develops a real-time navigation system that integrates camera footage for user-defined goal selection within the maze, enabling the robot to navigate to the chosen coordinates autonomously.

Keyword: TurtleBot3, Maze Navigation, ROS, Image Processing, Path Planning, Obstacle Detection

Date: March 24, 2024

Signatures of Students:

Signature of Supervisor(s):