DESIGNING A FRAMEWORK FOR ANALYZING MOBILE ROBOT BEHAVIOUR USING V-REP SIMULATOR

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STATEMENT BY THE AUTHOR

I hereby declare that this submission is my own work and to the best of my knowledge, it contains no material previously published or written by another person, nor material which to a substantial extent has been accepted for the award of any other degree or diploma at any educational institution, except where due acknowledgement is made in the thesis.

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ABSTRACT

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The purpose of this thesis work is to design a framework for analyzing mobile robot behaviour. The framework developed uses V-REP simulation software to observe the behaviour of the robots. The framework discusses behaviour such as postural, walking, explorational, human-following and aversive behaviour. Virtual models are created on bipedal robots, transporter robot and Autonomous Guided Vehicle (AGV). Experiments are conducted on those robots by adjusting their dynamic properties and/or surrounding environment. Validation is carried out by comparing the result of simulation and the real robots execution.

The system configuration, task and environment of the robot are the main factors affecting its behaviour. The simulation gives a more idealistic behaviour execution rather than realistic. Adjustments can be made to the simulation parameters to provide more realistic performance.

This thesis also proposes the use of simulation for learning the robot behaviour prior to developing the real system.

Keywords: framework, mobile robot, robot behaviour, modelling, simulation

DEDICATION

I dedicate this thesis for Swiss German University

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