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Special Aspects of Mobile Autonomous Systems

REPORT

Autonomous Object Hunting

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1 Introduction

This research project has the objective to design a mobile system that is able to search and identify an object while navigating in an unknown environment. The action of searching and identifying an object will further be referenced as hunting. Furthermore it builds a map of its surroundings and logs the navigated route. As the mobile system on its own only offers limited computing power, it will outsource computing intensive tasks to external computers. The resulting system will consist of multiple processes running on various devices.

The mobile system will be able to capture its surroundings and any obstacle by distance measurement sensors. They will be attached around the system in order to register surroundings in any direction. Additional sensors will keep track of the orientation and movements of the mobile system. This information will be used to predict the appearance of the environment in which the robot is located. As the specific shape and size of the object

Therefore the mobile system needs to be able to handle connections to external processes dynamically and independent of the current state or other events. The absence of an external process will result in loss of the regarding function, any other functionality shall be available regardless. This allows a flexible and modular software structure, where further processes can be added without disturbing the fundamental functionality.