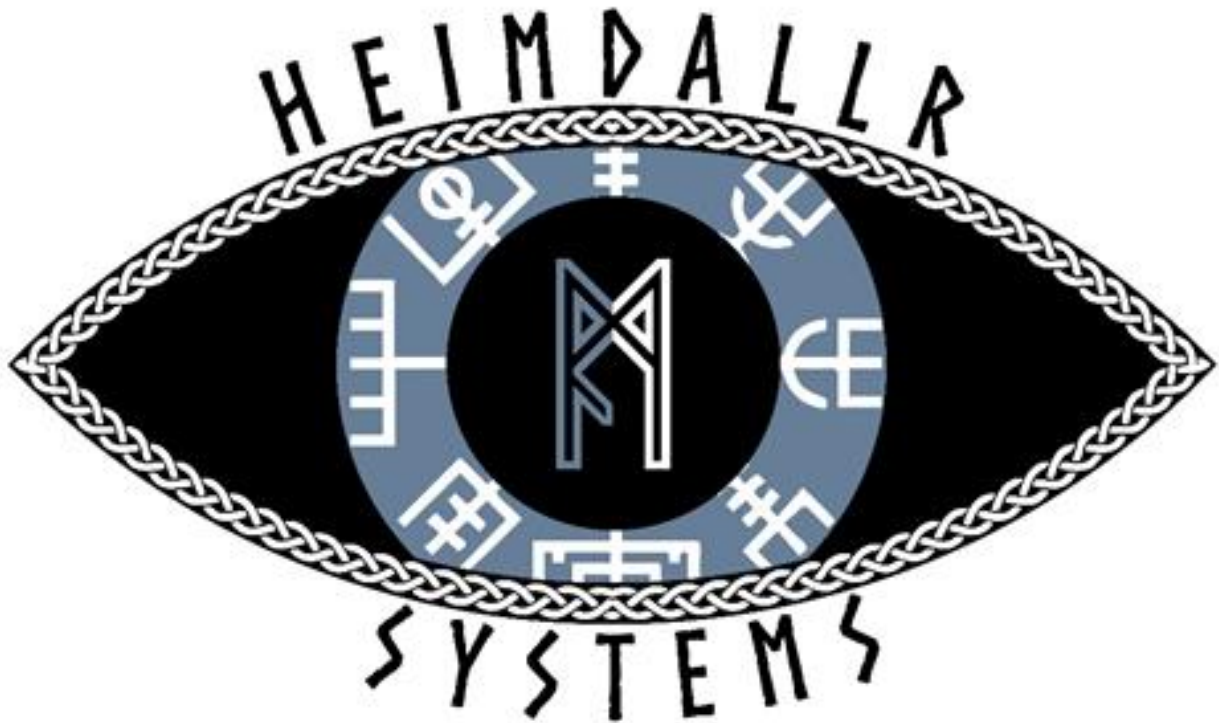


Requirements

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ME 407

Robotics Preliminary Design

Embry-Riddle Aeronautical University

EMBRY-RIDDLE
Aeronautical University

1.0 Introduction

Modern security and surveillance has provided protection of people and property. However, surveillance cameras can still provide blind spots for malicious people to take advantage of. Additionally, police and military are required to search and assault unknown locations, risking the lives of police and military personnel. Heimdallr Systems was conceived with the desire to protect both human lives and private property with the aid of a security surveillance robot.

2.0 Statements of Fact

2.1 The system will be a mobile system, able to move and operate on its own.

This is intended to be a statement of fact because the system should be more portable than a network of static security cameras. The system should be able to function in spaces that could be hostile, and would obviously be unable to be wired with cameras.

3.0 Design Requirements

3.1 The system shall provide live video feed to an operator.

3.2 The system shall communicate wirelessly with a control station.

3.3 The system shall report its current location when requested.

3.4 The system shall report changes in its known environment.

Changes in the system's known environment would be defined by a previously detected object changing position or appearing or disappearing.

3.5 The system shall be capable of operating remotely.

3.6 The system shall be capable of operating autonomously.

3.7 The system shall navigate to known waypoints in its environment.

3.8 The system shall be able to avoid obstacles.

An obstacle is an object that would prevent motion of the system through the object.

3.9 The system shall be able to operate indoors.

3.10 The system shall be able to operate outdoors.

The outdoor environment where the system will be designed to operate is the scrub-oak desert area immediately around Embry-Riddle in Prescott, Arizona.

3.11 The system shall operate without external power.

The intent of this requirement is to ensure the system operates using an on-board power supply, rather than being connected to a stationary generator or limited by a wall socket.

4.0 Design goals

4.1 The system should be able to move up and down stairs.

4.2 The system should be able to open and close doors.