Object Recognition and Path Smoothing Robot, Phase 1
Test Plan

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1 Revision History

- v0.1: In this version of the testplan we defined the scope of the problem with the introduction, test items and approach.

2 Introduction

2.1 Purpose

This test plan describes the testing approach and overall framework that will drive the testing of the ORPS-Robot version 0.1 – The Object Recognition and Path Smoothing robot. The document introduces:

Test Strategy: These are the rules the test will e based on including the givens of the project (e.g.: start / end dates, objectives, assumptions); description of the process to set up a valid test (e.g.: entry / exit criteria, creation of test cases, specific tasks to perform and scheduling)

Execution Strategy: describes how the test will be performed and process to identify and report problems, and to fix and implement fixes.

Test Management: process to handle the logistics of the test and all the events that come up during execution (e.g.: communications, escalation procedures and risk mitigation)

2.2 Project Overview

The ORPS-Robot will be a platform for validating the research of Michael McCourt and a scheme for exploring object recognition via OpenCV with Robot Operating System, which is a powerful framework for writing robot software. There will be a demonstration of Simultaneous Localization and Mapping (SLAM). Together this will demostrate a "finder robot" with applications in search and rescue and threat detection. Additionally there will be beacon triangulation and/or GPS to fuse additional location information into the SLAM or finder functionality.

2.3 Audience

Collaborative robotics software development for research in control systems for path smoothing. Collaboration in academic research is usually thought to mean equal partnership between two academic faculty members who are pursuing mutually interesting and beneficial research. In our case we are creating a platform which will serve Dr. McCourt research where deep understanding of the control system in place is not require on our part and a deep understanding of the robot are not require on the part of Dr. McCourt.

Creating truly, robust, general-purpose robot software is hard. As undergraduates using

robot operating system framework allows us to encompass solving robotics problems in real-world variations in complex tasks and environments that no single individual, laboratory, or institution could hole to create completely on their own from scratch. The audience for this device is us, as it serves our education.

Applications in path smoothing and object recognition used in ORPS-Robot project are heavily used in semi-autonomous and autonomous vehicles. The knowledge gain in applying these skills in the ROS ecosystem should serve us to gaining a greater knowledge of the systems and practices of both control systems and object recognition.

3 Test Items

3.1 Hardware Test Items

These will have more descriptions in later revisions.

360° LiDAR for SLAM & Navigation

Rasberry Pi 3 Model B

32-bit ARM Cortex-M7 OpenCR

DYNAMIXEL wheels

Li-Po Battery 11.1V 1,800mAh

Xbox 360 Controller

INCLUDE SENSORS PROVIDED BY DR. MCCOURT HERE

3.2 Software Test Items

I don't know what this will look like yet and am leaving this blank for now.

3.3 System Test Items

I don't know what this will look like yet and am leaving this blank for now.