***NAVIGATION OF AGVs***

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**Abstract**

In this paper, we introduce a vision system for the navigation of a ground vehicle. The major tasks in the project are low level motor control and image processing. The mobile robot was mechanically designed and simulated in the CAD Solidworks software and its operation and controls conceptually demonstrated in the ROS ecosystem. Its electric components were designed and simulated using Proteus electrical software.  
Low level motor control for the mecanum configuration is achieved by the use of motor drivers, here, the speed and direction of the motor is handled. Image processing is implemented by the use of raspberry pi camera and a raspberry pi 3b+ controller.

Intelligence, for navigation, is enabled by fusion of ultrasonic sensors, an inertial measurement unit and the camera sensors.

**INTRODUCTION**  
Robotics as a field incorporates various concepts and principles in solving a variety of tasks . A robot is a mobile robotic system which utilizes its mobility to navigate through any environment one can think of. Intelligence is a goal that many robotics engineers aspire to integrate into the system and this can be achieved by the use of computer vision, optimal control using PIDs, IMU and other sensor fusion techniques, remote, blue tooth or even joystick controlled among many. Computer vision has been a big influence in the robotics field especially in the robot arm industries, delivery robots and even humanoid robots. This field has been incorporated both in indoor and outdoor navigation like in the moon or dangerous environments that a human being cannot survive hence this is of essence, as our project deals with indoor navigation. This aims to imitate how a human being perceives its environment and navigate their ways through obstacles following a pre-ordained path while focusing on a specific goal. Even though this goal has not yet been achieved, machine learning appears promissory as models have proved to achieve the intelligence that resembles that of man. Raspberry pi is powerful tool for computer vision and this improves the functionality of robots making it one of the essential tools in mini projects unlike large assembly projects that possess their own controllers. Many studies and research have indicated that autonomous navigation is possible even with the simplest component e.g. a single camera.

**PROBLEM STATEMENT**

The robotics industry has been a constant area of research from its era of inception up to date. Introduction of intelligence in the indoor navigation is one among this thus the goal of this project is to adequately navigate in an indoor environment. Our goal is to perform this tasks in an intelligent manner mimicking the ability of man as closely as possible using a wheeled rc car.

**JUSTIFICATION**  
A robot is

PROJECT SCOPE

LITERATURE REVIEW

Navigation of an RC car along a preordained path using image processing via a raspberry pi webcam with the help of a Raspberry pi (this is known for image or video processing due to its computing power). The Raspberry pi is a computing component that has the ability to control various processes using its processor and memory

SOFTWARE REQUIREMENTS

DISCUSSION

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REFERENCES