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OCR BASED AUTO NAVIGATION OF MOBILE ROBOT BY READING SIGN BOARD

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Abstract **-** The robot is navigated using the signboard. The signboard is placed in the environment as landmark to decide the robot's next path. The signboard is designed such that the robot can perform key functions: the signboard detection, identification. Autonomous navigation of mobile robots in wide area as well as cooperative operations requires many signboards with unique identification pattern. Our colour signboard allows the robot to recognize the sign board when the signboard is visible entirely in the field of view. In OCR (Optical Character Recognition) show how text detection and recognition system, combined with several other ingredients, allows our robot to recognize named locations specified by a user. Service robots need to have maps that support their tasks. Traditional robot mapping solutions are well-suited to supporting navigation and obstacle avoidance tasks by representing occupancy information. The proposed system allows a robot to discover path automatically by detecting and reading textual information in signs located (Sign board) by using OCR. In this we show that the text-extraction component developed is a valuable on mobile robots.

Keywords **-OCR, Signboard, Automation**

I. INTRODUCTION

Autonomous navigation is an essential prerequisite for successful service robots. In contexts such as homes and offices, sign boards placed sideways of the road, places are often identified by text on signs Posted throughout the environment, by using the concept of the OCR, textual data can be extracted from the image (sign board) and navigate the robot. Landmarks such as signs make labelling particularly easy, as the appropriate label can be read directly from the landmark using Optical Character Recognition (OCR), without the need for human assistance. Robots can now routinely build metric maps of a new environment, and navigate from one location to another reliably. Prior work has shown that higher level knowledge can be extracted directly from these highly accurate maps, such as the locations of doors and corridors in order to build "semantic" representations of the environment

II. OBJECTIVE

The Proposed system allows a robot to discover path automatically by detecting and reading textual information in signs located (Sign board) by using OCR. In this we show that the text-extraction component developed is a valuable on mobile robots. In particular, our system allows the robot to identify named locations/Sign boards placed sideways of a road with high reliability, allowing it to satisfy requests from a user that refer to these places by name. Just remember that OCR (optical character recognition) is, as of now, an inexact science and you won't get flawless transcription in all cases.

III. PROBLEM DEFINITION

Service robots need to have maps that support their tasks. Traditional robot mapping solutions are well-suited to supporting navigation and obstacle avoidance tasks by representing occupancy information. However, it can be difficult to enable higher-level understanding of the world's structure using occupancy-based mapping solutions. One of the most important competencies for a service robot is to be able to accept commands from a human user. Many such commands will include instructions that reference objects, structures, or places, so our mapping system should be designed with this in mind.

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IV. METHODOLOGY

The Hardware Navigator with an Android Phone attached, sends a signal to the phone through Bluetooth as it comes across any RF card on its path. The phone, on receiving the specific signal invokes its camera to capture the snap of the path sign board and sends the image to the server through internet. The server processes the received image it to find out the actual meaning of the symbol like petrol pump, restaurant, left etc. through OCR (optical image recognition) mechanism. In OCR (Optical Image Recognition) we show how our text detection and recognition system, combined with several other ingredients, allows our robot to recognize named locations specified by a user. This meaning is reverted back to the phone which speaks up the meaning through its Text To Speech synthesizer, and transfers the signal to the navigator through Bluetooth for the possible move.

V. PROCESS DESCRIPTION

This chapter gives the brief description about the hardware components in this project and complete idea of the components used in the system.

BLOCK DIAGRAM

The basic block diagram (as shown in FIG. I) of the process and its explanation is given as follows

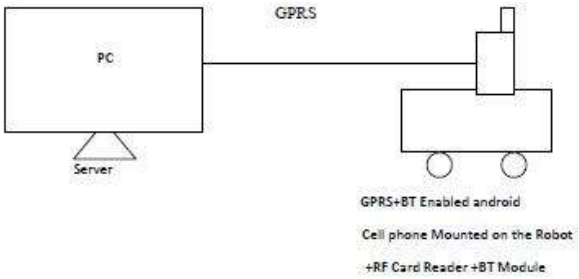
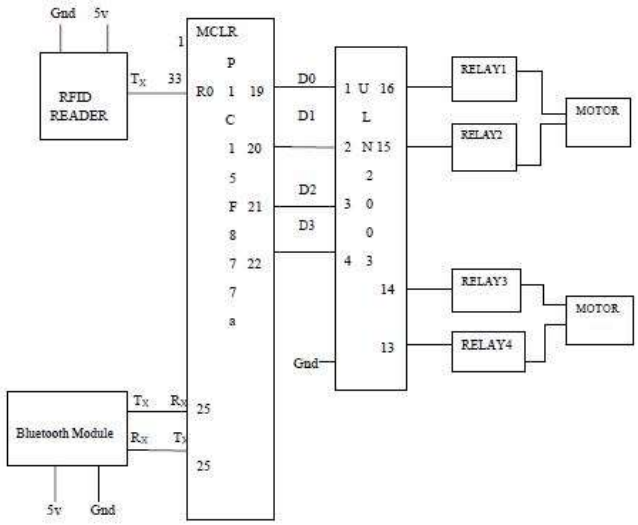


FIG I BLOCK DIAGRAM OF THE ROBOT

Assembly of robot

Design of OCR Robot



RFID Reader

Radio Frequency (RF) communications is based on laws of physics that describe the behaviour of electromagnetic energy waves. For the purpose of providing a very cursory understanding of the technology this explanation will use very informal terminology to describe what is happening.

Bluetooth Module

Bluetooth modules are wireless module transceivers with standard packaged Bluetooth technology including enclosure, power supply and antenna; communicating wirelessly between two or more modules. Bluetooth is intended to get around the problems that come with both infrared and cable synchronizing systems. There are three important features to Bluetooth.

Overview of Microcontroller PIC15F766a

Microcontroller neither is a small computer on a single integrated circuit containing a processor core, memory in the form of NOR flashes or OTP ROM is also often included on chip, as well as a typically small amount of RAM. Microcontrollers are designed for embedded applications, in contrast to the microprocessors used in personal computers or other general purpose applications. The device specific information is as follows:

- The PIC15F766 devices come in 30-pin packages.
- The Parallel Slave Port is not implemented on the 27-pin devices.

Overview of ULN2003 Darlington Sink Driver

The ULN2003 are high – voltage, high – current Darlington drivers comprised of seven NPN Darlington pairs. All units' features are used in integral clamp diodes for switching inductive loads. Applications include relay, hammer, lamp and display (LED) drivers. Features of ULN2003 are:

- Output current (single output) 400 mA MAX.
- High sustaining voltage output 40v MIN.
- Output clamp diodes.
- Input compatible with various type of logic.
- Package Type - AP: DIP – 15pin.
- Package Type – AFW: SQL – 15pin.

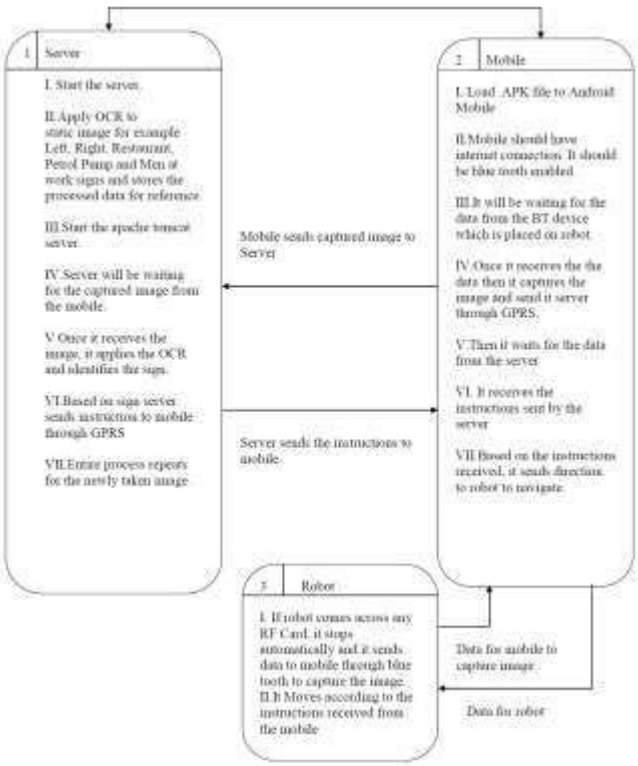
Relay

The relay that we are using in this project is an 230V/ 2Amp relay and it's an electro mechanical relay. The excitation voltage that is required is +12V DC. It is driven using the Relay driver IC ULN2003.

Battery

Battery provides power to OCR Robot.

Data Flow Diagram



CONCLUTION

Proposed system allows a robot to discover path automatically by detecting and reading textual information in signs located (Sign board) by using OCR. This is proposal theory and implementation of an Optical Character Recognition (OCR). The principal idea is to convert images of text documents such as those obtained from scanning a document into editable texts. The proposed theory does not address the pre-processing steps such as skew correction and noise reduction, so the documents are assumed to pre-processed by another tool in the pipeline. Inspired by the well-know iPhone app "Word Lens", we developed an Android-platform based text translation application that is able to recognize the text captured by a mobile phone camera, translate the text, and display the translation result back onto the screen of the mobile phone. Our text extraction and recognition algorithm has a correct-recognition rate that is greater than 74% on character level. In this proposed system, we demonstrate the system flow, the text detection algorithm and detailed experiment result.

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