

# IoT Based Robot Navigator

” Simulation of a robot with IoT  
and learning controller”

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**Abstract** - Here in this paper we develop a smart Robotic Assistant that will helping lot in multiple ways. The RA can be accessed remotely. We are implementing a IoT based Robot Navigator which will help people to navigating correct direction in college campus. The RA is useful for navigate robot. An Arduino micro controller is used to develop this smart RA. IoT base Robot Navigator is navigate by using device like smart phones etc. The gestures commands and voice commands are processed for the giving information about campus. The working of RA is as follows the gestures commands and human voice commands are converted to text form and giving to robot by using GPS and Bluetooth connectivity. The RA is performing different operations are like start/stop, move left/right, forward/backward, picking up object and placing it in another location. These peculiarities are really helpful for humans especially for elderly people.

**Index Terms:** - Voice Commands, Gesture Commands, Smart Robotic Assistant, GPS Network, Android Based Smart IoT Devices.

## 1. INTRODUCTION

We are implementing a IoT based Robot Navigator which will help people to navigating correct direction in college campus. When person coming to main gate of college campus, he needs to register through android app. He needs to enter his details and where he wants go. Arduino will be controlling a robot like he will give the current location through voice message. We will give specific time slot for each location and robot will be cover that direction in minimum time will be given by robot.

The RA operates on human voice commands or through android Application given remotely by using an Android platform based smart IoT device like smart phone. The commands are converted to text form and is the communicated to the Robot. The RA [Robotic Assistant] is provided with mechanical wheels to go from one location to another location.

An Arduino/Raspberry-pi micro-controller-based platform is used to develop this smart Robot that work as a heart of that robot. The RA is capable of performing different operations like start/stop, move left/right, forward/backward, location. These peculiarities are really helpful for person which is new in college campus. The first requirement for the design of the robot is the micro-controller. In this project, Intel Edison Arduino micro controller has been used. The Intel Edison module is a SoC (System on Chip) that includes an Intel Atom 500MHz dual-core, dual-threaded CPU and an Intel Quark 100MHz micro-controller. Intel Edison Kit for Arduino provides the Arduino 1.0 pin out and standard connectors such as a micro USB connected to a UART, a USB OTG port that

can be switched between a second micro USB device connector, a standard size USB host Type- A connector, a SD card holder, and a DC power jack. The Intel Edison Kit for Arduino makes possible to have 20 digital input/output pins, of which 6 can be used as analogue inputs.

## 2. EASE OF USE

We are implementing a IoT based Robot Navigation which will help people to navigating correct direction in college campus. When person coming to main gate of college campus person have to register through android app. He needs to enter his details that where he/she wants go. In this system we will implement a robot which is control by Raspberry Pi. Raspberry pi will control a robot. And this person will give the input current location and destination through android App. The person will give specific time slot for each location and robot will be cover that direction in that specified time and then voice message will be given by robot that here is the destination.

## 3. LITERATURE REVIEW

For the study of geological missing data prediction and interpolation we studied following papers.

K. Warwicket et al. Historical and current machine intelligence, IEEE Instrum. It utilizes a stationary network of passive infrared sensor nodes interconnected through a multihop Zigbee network. The sensors are motion sensitive and using regional localization can be used for identifying the location of source or destination based on the situation. The robot is controlled via a Wi-Fi link which streams control by

android smart phones. The main processor is a AM335x ARM processor. It also acts as relay for the sensor data. Each node consists of three passive infrared detection circuits each covering a sector of 120 degrees and connects via the TI CC2530 ZNP chip. The raw PIR data is signal conditioned using an LM324 Op-amp. The nodes can be deployed easily due to their compact size. Their low power consumption and low cost makes them ideal for remote areas and can be deployed in large numbers [3].

C.P. Urmston et al. Stereo Vision Based Navigation for SunSynctoonous a smart Robotic Assistant (RA) that will help human being a lot in multiple ways. The area used is Internet of Things (IoT). The RA can be accessed remotely using human voice commands and gestures. The RA is provided with mechanical arms to pick an object and place it in another location [ 6].

A.K. Ray et al. Sonar Based Autonomous Automatic Guided Vehicle (AGV) Navigation which is based on system autonomous to navigate vehicle [3].

M. Ogaz et al. Data Processing from a Laser Range Finder Sensor for the Construction Midwest Symposium on Circuits and Systems Data processing from a laser range finder sensor of commutation[2].

S. Karamchandani et al. Robot Navigation System with RFID and Ultrasonic Sensors. This system makes the robot able to navigate around the building and records in indoor environment [ 1].

H.R. Choi, et al. Integrating robots into the Internet of Things International Journal of Circuits, System and Signal Processing In system network of interconnected objects, can be considered an evolutionary process, rather than a completely new one [5].

#### 4. RESULT AND ANALYSIS

This a smart Robot Navigator system which will assist person or human from source to destination such a this.

##### Equations

- Input:**

S Represents Source i.e. college gate  $S=S_1, S_2, S_3, \dots, S_n$  D Represents Destination  $D=D_1, D_2, D_3, \dots, D_n$  where,  
 $D_1=SP$  College,  
 $D_2=SITRC$  College,  
 $D_3=SIP$  College.

- Output:**

1. As shown in below fig.1., let be the rule of Source (Sc) into D1 Such a that, Robot will be navigated from college gate to SP College.

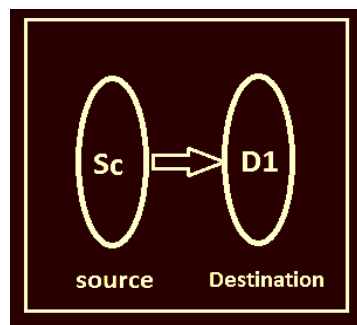


Fig.1.Output Condition 1

2. As shown in below fig.2., let be the rule of Source (Sc) into D2 Such a that, Robot will be navigated from college gate to SP College.

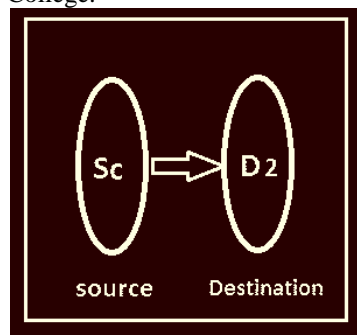


Fig.2.Output Condition 2

3. As shown in below fig.3., let be the rule of Source (Sc) into D3 Such a that, Robot will be navigated from college gate to SP College.

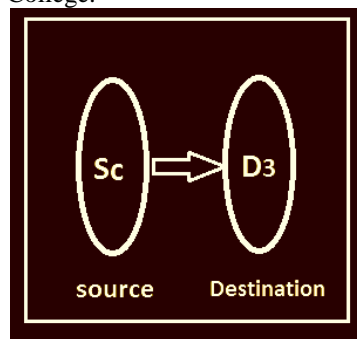


Fig.3.Output Condition 3

- Result:**

As shown in below fig.4., Result will appear like,

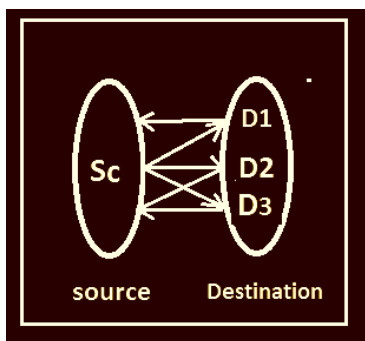


Fig.4.Success Condition

### **Acknowledgment**

The main aim of this project is to reduce the time consuming by person to find out the destination in particular campus. It will be also helpful for colleges campus which have a big infrastructure, big IT company, Hospital, New campus region. This system will useful for avoiding the misguidance from unknown people.

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