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IOT BASED ANTENNA POSITIONING SYSTEM FOR WIRELESS NETWORK

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Abstract: All wireless communication systems work on antennas for reception of signals. Proper positioning of antennas is necessary according to satellites/transmitters to achieve effective wireless communication. So here we proposed an IOT based antenna positioning system that allows for remotely positioning of antennas based over IOT. Here we use sensor based system with motor on each antenna using antenna to check its facing direction that is transmitted over IOT. If the direction of a satellite or transmitting station changes over time, the antenna direction must also be changed accordingly. The receiving antennas may be placed far apart from each other across the globe. So our system allows for antenna positioning over very long distances. The antenna positions are visible over internet to controlling operator on the IOT GUI. We here use IOT Gecko to develop the antenna monitoring gui system. Our system allows for monitoring antenna direction as well as transmitting new coordinates to position the antenna and motor appropriately positions the antenna accordingly.

I. Introduction

INTERNET OF THINGS-IOT

The IOT concept was coined by a member of the Radio Frequency Identification (RFID) development community in 1999, and it has recently become more relevant to the practical world largely because of the growth of mobile devices, embedded and ubiquitous communication, cloud computing and data analytics. Imagine a world where billions of objects can sense, communicate and share information, all interconnected over public or private Internet Protocol (IP) networks. These interconnected objects have data regularly collected, analysed and used to initiate action, providing a wealth of intelligence for planning, management and decision making. This is the world of the Internet of Things (IOT). Internet of things common definition is defining as: Internet of

things (IOT) is a network of physical objects. The internet is not only a network of computers, but it has evolved into a network of device of all type and sizes , vehicles, smart phones, home appliances, toys, cameras, medical instruments and industrial systems, animals, people, buildings, all connected ,all communicating & sharing information based on stipulated protocols in order to achieve smart reorganizations, positioning, tracing, safe & control & even personal real time online monitoring , online upgrade, process control & administration We define IOT into three categories as below: Internet of things is an internet of three things People to people, People to machine /things, Things /machine to things /machine, Interacting through internet. Internet of Things Vision: Internet of Things (IoT) is a concept and a paradigm that considers pervasive presence in the environment of a variety of things/objects that through wireless and

wired connections and unique addressing schemes are able to interact with each other and cooperate with other things/objects to create new applications/services and reach common goals. In this context the research and development challenges to create a smart world are enormous. A world where the real, digital and the virtual are converging to create smart environments that make energy, transport, cities and many other areas more intelligent.

Internet of Things is refer to the general idea of things, especially everyday objects, that are readable, recognisable, locatable, addressable through information sensing device and/or controllable via the Internet, irrespective of the communication means (whether via RFID, wireless LAN, wide area networks, or other means). Internet of Things is a new revolution of the Internet. Objects make themselves recognizable and they obtain intelligence by making or enabling context related decisions thanks to the fact that they can communicate information about themselves. They can access information that has been aggregated by other things, or they can be components of complex services. This transformation is concomitant with the emergence of cloud computing capabilities and the transition of the Internet towards IPv6 with an almost unlimited addressing capacity. The goal of the Internet of Things is to enable things to be connected anytime, anyplace, with anything and anyone ideally using any path/network and any service.

II. Block diagram and Working

IOT has become one of the most important technologies of 21st century. Internet Of Things (IOT) refers to a physical device that is connected to the

internet that is collecting and sharing data, it is possible to turn anything into the part of IOT. Now that we can connect everyday objects, kitchen appliances, cars, thermostats. baby monitors to the internet via embedded devices, different sensors. Communication is possible between people, processes, and things. IOT devices are designed to be small, have a long wireless range, and have a long battery life. However every single Internet Of Thing (IOT) device needs an antenna. The antenna is the means by which an IOT device receives and sends a signal to the outside world and therefore is the fundamental element of an IOT device. So it is very important to have proper antennas. The antenna is crucial it may make or break the communication with devices. A correct positioning of antenna will give you good wireless range or it will cause your devices to not even be reachable in the field. So for the proper positioning of antennas is necessary for the wireless communication. This system is used to direct the antenna direction in correct position. This system is difficult to achieved if antenna is placed in the wrong direction. The important features of this system are as follows:

1. Parameters Stored: The user can select among the parameters like angle and direction in order to position the antenna with great ease through this application.
2. Direction Specified: The user need to specify the direction whether clockwise or anti-clockwise direction.

Antenna is moved by user command received through position Blynk app. Blynk is an IOT platform aimed to simplify building mobile and web applications for the IOT. It is used for connecting devices to the cloud, designing apps to remotely control and monitor

them. The Blynk app act as remote and is used to send the signal to the MCU through the internet. According to commands received from Blynk direction of antenna will be changed as per specified direction of motor. This will result to positioning of antenna at required position.

Block diagram

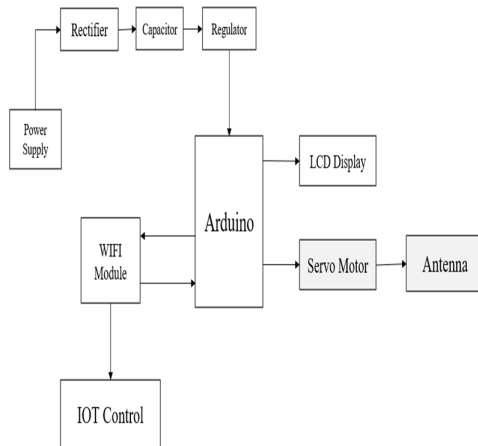


Fig.1 Block Diagram

Methodology

The system consist of two parts.The circuit of antenna and motor control and the WIFI app for user commands. The circuit installed consists of various components such as Servo motors interfaced with arduino.The arduino controller is responsible for positioning the motors. Depending upon current reading of accelerometer, the controller takes input from user through the wifi app via wifi module and motors move to intended position. As a result, the user will receive current position of antenna and positioning of antenna will be done according to user commands.

III. Advantages, Disadvantages and Applications

A. Advantages

- Can identify different types of signals

- Can increase the range of detection
- Can adjust antenna angle to accurate level
- Highly reliable

B. Disadvantages

Investment and Maintenance are disadvantages.

C. Applications

Parameters stored:- The user can select among parameters like angle and direction in order to position the antenna with great ease through this application.

Direction specified:-The user needs to specify the direction whether clockwise or anti-clockwise direction.

Signal strength:-The application can only specify the signal strength after positioning the signal in the proper direction.

IV. Results

IOT based antenna positioning system for wireless network that allows automatic positioning of antenna as per user commands over the internet using ARDUINO.

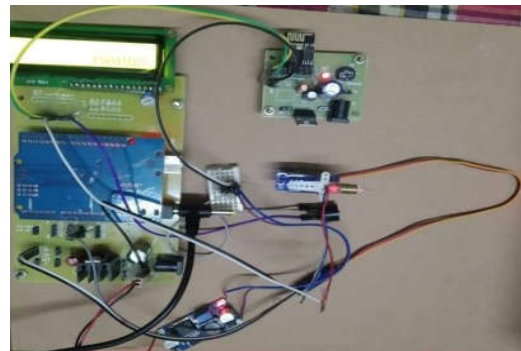


Fig.2 Schematic diagram

Based on user command Positioning of antenna is done at 0 degree.

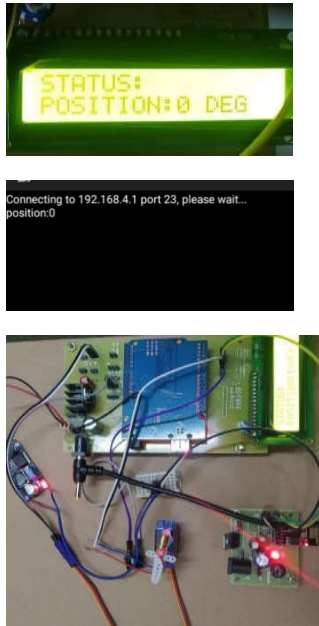


Fig.3 Positioning of antenna at 0 degree

Based on user command positioning of antenna is done at 180 degrees.

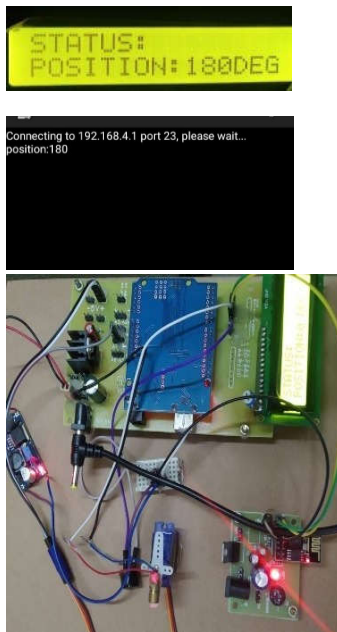


Fig. 4 Positioning of antenna at 180 degrees

VI. Conclusion

The IOT based Antenna Positioning System is used to positioned the antenna without handling manually, depending

on the input received signal from telet app. According to received signal we can change the direction of motors. The antenna position is mainly depends on the precision of the stepper motor in which motor can rotate clockwise or anti-clockwise. It is cost effective, compact in size. It is also user friendly and remotely accessible.

VII. References

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