TagDroid: The Object Finder Using Zigbee

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Abstract - It is a human tendency to forget some particular things like keys, wallets, laptops etc frequently. We propose design of device called TagDroid which can be attached, sticked or droped to any of your belongings which you tend to forget like laptops, wallet, keys etc. and then when it is lost we can use our TagDroid App in Android phone to locate our belongings. This is a unique device as it is just a size of a matchbox. We are implementing it using Zigbee technology which will be having a range of about more than Bluetooth device. Thus this TagDroid will be of more advantage to Android users who tend to forget their belongings. This device also uses a buzzer alert system, which can be used when an object is nearby but not visible to us. This is a future technology in which many new modifications can be done.

Keywords: Zigbee, Object Finder, TagDroid.

I. INTRODUCTION

TagDroid a product designed for lost and found is going to be the next big thing in this tech savvy world of gadgets. This new technology which works on simple principle but do a very important work of finding lost things. As people are very much busy with their jobs and in this fast life anyone will obviously forget some things or the other. To cope with this problem we are introducing a gadget designed to be placed on the product or things which probably can get lost due to some reason or the other. So as a precautionary measure we can attach our newly designed device which will get to track the Tagdroid (product). If the lost item is within our wifi range we can find it and if found then the Tagdroid will send buzzer signal to locate to the master.

We can also have a cloud application in which we can login and have a log of the lost item or the item we placed a month or year ago. If the lost item is not in our reach i.e not in the wifi range, then we can share lost item's Tagdroid signature to the Tagdroid community online. By then all other Tagdroid users will be in look out for your Tagdroid, if any tile user gets into the range of the lost item, then phone will discreetly and securely communicated with our cloud system, the whereabouts of your Tagdroid will be automatically updated on our app in mobile. So Tagdroid can be used to find some items.

II. PREVIOUS WORK

In previous systems they were using Bluetooth technology. They used Bluetooth device and a LED to locate object. It did not fair well in the market because of its low range, insufficient capabilities and limited functionalities. It also did not provided advanced features like Zigbee technology, location feature, Buzzer, GPS, Multipe TagDroid support.

III. PROPOSED METHODOLOGY

The proposed system rules out all the impossibilities and the disadvantages of the existing system. First issue that has been solved is the complexity of the device. The system's user-interface is simple and user friendly. Secondly, the cost and expense of the system is reduced. The sensors used are feasible and have a long-battery life. Generic transmitters and receivers can be applied instead of a Bluetooth embedded transmitter and receiver. The device could be embedded with its own GPS- like system and Antenna (which would behave like a satellite) and could map the location of the lost/tracked object. Mapping could be done using mathematical calculations like Trigonometry heights and distances and angle calculations. The proposed system would also support internationalization, thereby providing international acceptance. The advantage of this system is that it switches on the GPS only when the user requests.
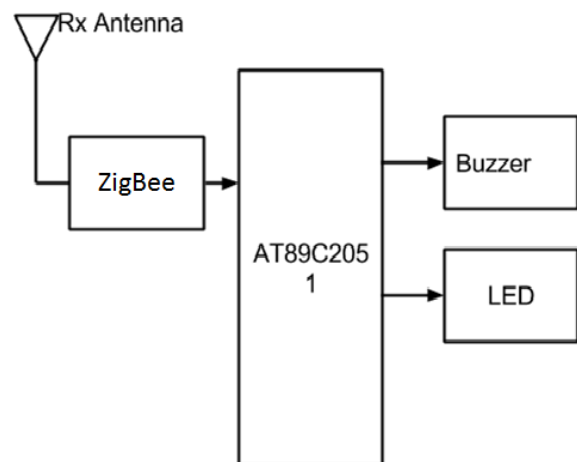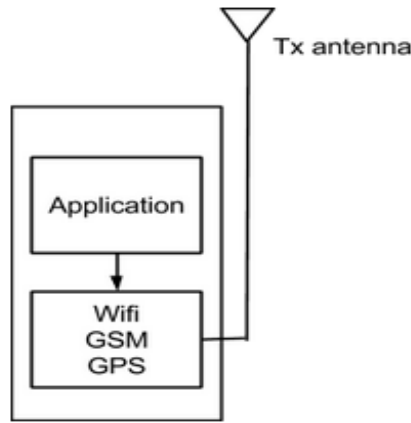

Fig 3.1 TagDroid block diagram

Fig 3.2 Mobile side block diagram

A. MOBILE APPLICATION (USER INTERFACE)

A mobile application, Fig.3, is used as a user- interface to facilitate the user to choose what object she/he needs to locate. The mobile application is written using Java script and could be run in android mobile phones . The application allows the user to select from the option- Menu, which contains the list of synchronized tags, GPS, which is the GPS application which maps to the location of the sensor, and History contains details about the past searches.

The user can select from the menu, of what object she wants to locate. The menu also provides an option for the user to replace the Tag name with the item name, eg., here Tag 1 was replaced by BIKE KEY, and Tag 2 is being renamed to another item , by choosing the edit option provided.

Once the item is chosen, the pseudo-random code is generated and the radio-signal is broadcasted. The tag with the matching signal, from the receiver end, is synchronized and the alarm system gets activated.

The history column is a database which stores the past activities of the user involved in the search process. The location originally tracked can be stored and modified in the GPS database which can be retrieved during the next search.

B. GLOBAL POSITIONING SYSTEM (GPS) AND GLOBAL SYSTEM FOR MOBILE COMMUNICATION (GSM)

A GPS receiver relies on radio waves and it communicates with satellites that orbit the earth. In order to determine the object's location, a GPS receiver has to determine:

- The locations of at least three satellites above the item

- Where the items are in relation to those satellites

The receiver then uses Trilateration to determine your exact location. Basically, it draws a sphere around each of three satellites it can locate. These three spheres intersect in two points -- one is in space, and one is on the ground. The point on the ground at which the three spheres intersect is your item's location. GSM is used to return the latitude and longitude as a text message. The mobile is synchronized with the GSM module and the process is initiated with a text to the GSM module from the mobile. The GSM receives it and it returns the latitude and longitude calculated by the GPS in the form of message to the mobile phone.

C. WIFI AND TRACKING

The user has to select the lost item's button from the list in the mobile application. 128 bit pseudo random in the form of radio signals from are sent as wifi. The mobile and the receivers are synchronized to the same frequency. The transmitter's controller chip has a memory location that holds the existing 40 bit code. The receiver's controller chip also has a memory location that holds the current 40-bitcode. If the receiver gets the 40 bit code it looks forward to, then it performs the requested function. If not, the mobile application notifies the user the object is not found and asks whether the GPS as to be switched on. Both the transmitter and the receiver use the same pseudo-random number generator. When the transmitter sends the bit code, it uses a pseudorandom number generator to select a new code, which is stored in its memory. On the receiver end, when the sensor receives a valid code, it uses the same pseudo- random number generated to pick a new one. This means, the transmitter and the receiver are synchronized. The receiver initiates the buzzer system only if it receives the code it expects.The other receivers will remain idle. In case the item is not within the range, GPS would be initiated. We can find the item using GPS. A database called a 'Location Manager' that holds all the locations of the misplaced items is used. The details from this location manager can be retrieved and used whenever needed..

IV. CONCLUSION

In this paper we proposed a device TagDroid which can be attached, sticked or droped to any of your belongings which you tend to forget like laptops, wallet, keys etc. and then when it is lost we can use our TagDroid App in Android phone to locate our belongings. This is a unique device as it is just a size of a matchbox. This device also uses a buzzer alert system, which can be used when an object is nearby but

not visible to us. Hence we have tried our hand in overcoming the disadvantages and the shortcomings of the Bluetooth technology by using Zigbee which provides us better range and response as compared to the Bluetooth capable device. We think this product have high potential for marketing in the future.

V.   ACKNOWLEDGEMENT

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