Define Bluetooth as A Human–Machine Interface Way of Different Mobile Network Node in Wireless Communication

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Abstract: The paper describes the functioning of the application for the mobile devices that run on Android operating system; which physically controls the Adriano based mechanism using wireless Bluetooth technology. It also describes the use of the camera mounted on the automaton that can wirelessly transmit real time video feed onto the designed android application using Wi-Fi technology. We explain industrial automation via Bluetooth using IISS. Industrial automation is one of the major applications of Bluetooth technology. Industrial automation, in terms of controlling or monitoring a factory, office, or industrial process, means to install machines that can do the work instead of human workers. These details in the article establish the growing need for Bluetooth technology.

Keywords: Bluetooth, Tracking, Human–machine interface, Wi-Fi.

I. INTRODUCTION:
The Bluetooth network is used to connect mobile nodes and other pervasive devices over the ISM band at 2.420-2.485GHz, technology plays very important role in human life. Robotics has developed drastically in few decades surveillance system with robotics control provide a great solutions for various controlling purposes. The current surveillance systems present in the market are very expensive and have limited capabilities. It basically communicates via the interface card in the PC; the hardware is connected parallel across the device, and it is interfaced with the PC via a transceiver. The device can be accessed both manually via the switches and remotely via the PC.

The use of wireless communication technologies is an attractive opportunity, especially in view of the fact that in Mauritius, mobile devices including laptops, PDAs and sophisticated mobile phones are becoming widespread among the population and increasing every year. This medium was originally developed as a mean for cable replacement for communication between mobile phones and related accessories; and consequently increases their functionalities. But, nowadays another purpose of the latter is starting to gain momentum that includes broadcasting.

II. BLUETOOTH OVERVIEW
Bluetooth is a short-range wireless technology for local area and personal area networking to interconnect low-power devices and portable computers. Since its inception in early 1998, it has been accepted and utilised worldwide; however since it is a fairly new technology it still has to be further improved to increase its functionalities. Bluetooth operates at 2.4 GHz in the ISM band.

2.1. Open Specification
Bluetooth technology is available for everyone and is royalty free.

- Bluetooth BR/EDR—establishes a relatively short-range, continuous wireless connection, which makes it ideal for use cases such as streaming audio
- Bluetooth with low energy functionality (LE)—allows for short bursts of long-range radio connection, making it ideal for Internet of Things (IoT) applications that don’t require continuous connection but depend on long battery life
- Dual-Mode—dual-mode chipsets are available to support single devices such as smartphones or tablets that need to connect to both BR/EDR devices (such as audio headsets) and LE devices (such as wearables or retail beacons)

2.2. Short Range Communication
2.2.1. Low Power
Devices that support Bluetooth low energy Gateway functionality provide a transparent pipe from a device to an IP address. Middleware at the
IP address can access the device directly as if it were a collector talking to it locally. The Gateway device plays no part other than in acting as a pipe.

2.2.2. Robustness

Bluetooth technology operates in the unlicensed industrial, scientific and medical (ISM) band at 2.4 GHz, using a spread spectrum, frequency hopping, full-duplex signal at a nominal rate of 1600 hops/sec. A benefit of utilizing the 2.4 GHz ISM band is its unlicensed availability in most countries. The technology is now available in its fourth version of the specification and continues to develop, building on its inherent strengths — small-form factor radio, low power, low cost, built-in security, robustness, ease-of-use, and ad hoc networking abilities. Bluetooth wireless technology is the leading short-range wireless technology on the market today shipping over five million units every week with an installed base of one billion units in 2006.

III. SYSTEM COMPONENTS

3.1. Bluetooth enabled mobile phone

All the persons in the network own a Bluetooth enabled mobile phone through which they connect to the network, which they use to make a request to track others and also for themselves to be located by others.

3.2. Bluetooth (BT) Access Points

A BT Class 3 device with a range of around 10 meters may also be called as reader node is a Bluetooth transceiver present for an immediate connection to the mobile phone. These access points are needed to incorporate the core Bluetooth protocols (mandatorily present in all BT devices) like Link Management Protocol (LMP), Logical Link Control and Adaptation Protocol (L2CAP) and Service Discovery Protocol (SDP). Additionally, there is need of Radio Frequency Communications (RFCOMM) protocol which provides for binary data transport by creating a virtual serial data link.

3.3. Gateway Nodes

These are integrated Bluetooth and Wi-Fi nodes which act as a gateway to connect the bluetooth network to the Wi-Fi network. Both these wireless technologies operate in the 2.4 GHz radio frequency range allowing for the option of a shared antenna system which has been successfully incorporated in BCM4324 chip featuring Broadcom’s In Concert technology, which consists of sophisticated software algorithms and hardware mechanisms that enable collaborative coexistence between Wi-Fi and Bluetooth and thereby paving way for entirely new network applications.

IV. RECEIVERS MOBILE ACTIVITIES

On start the bluetooth is contineously in listening state and when any device request for connection it will accept the request and start connecting once connected starts the track and play received data. This will open sockets to connect with other PCs on LAN. After that accept Bluetooth connection request and connect with requested device. After connection receives the Bluetooth address and send it to other PCs on LAN also wait for reply if any PC sends found then received message sends to the connected mobile device and start transferring data between PC and
mobile. Bluetooth address from other computer and start searching for the received address in its range. If required device Found then search for service in Found device. If not found then sends Not Found to the other PC and start listening.

4.1. SECURITY
A challenge-response mechanism is engaged for certification using Bluetooth address as the public key and a 128-bit integer during device initialization as the private key. In addition, another 128-bit haphazard number is used for each new session. Encryption is also included to maintain link privacy. As a result, devices can be classified as “trusted” and “untrusted,” and services as “requiring authorization and authentication,” “requiring authentication only,” and services open to all devices.

V. CONCLUSIONS
The upshot of data types and size was assessed. However, it was observed that the data transmission was dependent only on data size. The potential of using Bluetooth as a broadcasting medium for transmission of data has been described in this paper. The results from the different test scenarios indicate that the performance of Bluetooth is highly dependent on the Bluetooth devices being used the type of data used had no effect on transmission time. Another advantage of using such a system lies in its use of mobile phones for tracking. With development of mobile phone apps on almost all platforms at such a large scale, there is a lot of scope of adding new capabilities and features to this system. One such example would be to generate a map/path based on the location of the user making request and the location tracked which would further ease the process of positioning.

VI. REFERENCE: