

Yashwantrao Chavan College of Science, Karad

Department of Electronics

Student Seminar -2020-21

Class – B.Sc.II

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HOD

Department of Electronics
Yashwantrao Chavan College of Science,
Karad


Principal

Yashwantrao Chavan College of Science, Karad

Yashwantrao Chavan College of Science, Karad

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Student Seminar 2020-21

Class: -B.Sc.II

Notice

Date :02/01/2021

All students of the B.Sc. III class are informed that, seminar is arranged on 05/01/2021 at 12:00 pm in online mode. It is compulsory for all students. All should note and follow.


Head
Department of Electronics
Yashwantrao Chavan College Of Science, Karad

YASHWANTRAO CHAVAN COLLEGE OF SCIENCE KARAD

DEPARTMENT OF ELECTRONICS

Seminar Report

Academic Year 2020 -21

Sr.No.	Name of student	Seminar Title
1.	Bhandare Varsha Panjabrao	Linear Variable Differential Transformer
2.	Chavan Harshad Subhash	Bluetooth Technology
3.	Deshmukh Chaitali Sambhaji	Smart Note Taker
4.	Deshmukh Shubham Tanaji	E-waste
5.	Ghadge Mayur Maruti	IP technology
6.	Hirwale Rohan Mahesh	Arduino
7.	Jadhav Sahil Vinayak	Hotspot
8.	Jadhav Vinayak Kumar	GPS System
9.	Jagdale Amar Dhanaji	5G Version
10.	Kachare Aishwarya Ankush	Screenless Display
11.	Kaski Kalyani Basavraj	Nano Technology
12.	Katre Gauri Chandrakant	Bio matrix
13.	Khabale Yogaita Duryodhan	Wi-fi Technology
14.	Panaskar Shrutika Vijay	Bluetooth Technogy
15.	Pawar Vaishnavi Arjun	LiFi



16.	Pawar Ashwini Sanjay	Zigbee Technology
17.	Pawar Pratiksha Suresh	3D Printer
18.	Pol Prashant Gangaram	IOT
19.	Rathode Sachin Uttam	Data Converter
20.	Surve Shivani Sunil	Microcontroller
21.	Suryawanshi Shidhant Bajrang	Digital Control Device
22.	Vadar Ganesh Subhash	Robotics
23.	Sutar Saurabh Shivaji	8051 Microcontroller
24.	Vishwakarma Aman Arvind	ROM Memory



Teacher Incharge



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HEAD

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Karad



Principal
Yashwantrao Chavan College of Science, Karad



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KARAD

Department of Electronics

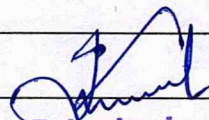
CLASS :- BSC-II , Year :- 2020 - 21

Student Name :- chavan Harshad Subhash

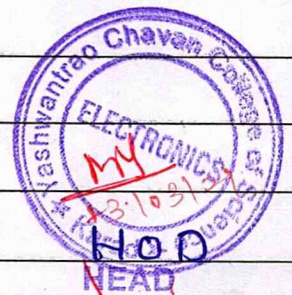
Title of Seminar - BLUETOOTH Technology

~~my~~
Teacher
in - charge

~~my~~
Examiner


Principal

Yashwantrao Chavan College of Science, Karad



Department of Electronics
Yashwantrao Chavan College of Science
Karad

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Introduction :

Living in a wireless world is not a distant dream anymore Bluetooth is the current killer application with promising future which bring us to that end.

Bluetooth is wireless, automatic connection that is aimed at simplifying and communicating in internet and data technology facilitating cable replacement technology. It works on a universal medium to bridge the data networks peripheral interface to form a short range digital unlicensed radio frequency at 2.4 GHz in wide range of 10 mts.

Due to their independence on short range radio link Bluetooth devices do not require a line of site connections in order to communicate. Bluetooth technology has proven to be eligible to industrial specification for wireless personal area network (PAN).

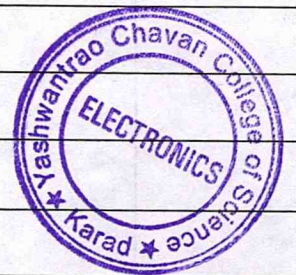
Requiring little bandwidth and significant features of robustness, low power &

low cost efficiency. It has created a strong under current in the technical space since it is so economical, powerful and reliable.



HISTORY

Bluetooth has a very facinating History which stracted in 10th century the viking of Demark ,Harald Garmesen blatand. established a rune stone to connect people In 1994 ,IT -company ERICSS on initiated a multi-communication link Jaap Haarsten and Sven mattisson gave birth to Bluetooth .the project become Successful in Spring 1998 the companies ERICSSON erected a rune stone in (LUND) (SWEDEN) in memory of great king who had on epithet of multi communicating thus keeping with its namesake | Bluetooth also connects diffent with variety of Devices with each other.

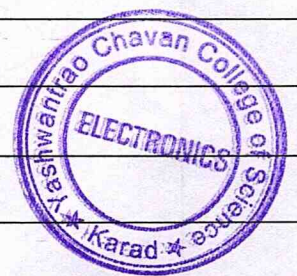


Abstract :-

Living in a wireless world is not distant dream anymore. the Bluetooth technology is the current killer technical operation with promising future, which brings us closer than the end Bluetooth technology is wireless art of connection that is aimed at simplifying and the communicating in internet and data in Synchronization facilitating cable replacement technology. It works on a universal medium to bridge the complex data networks, peripheral interface to from a short range digital radio frequency of 2.4 GHz in a wide range of wireless range of the 10m vs. the Bluetooth has proven to be the elixir to industrial specification for the wireless personal Area Network (PAN) requiring little bandwidth with significant features of robustness low power and low cost efficiency. It supports the personal bubble which transmits both voices & data for multiple devices connected.



In piconet or scatter net Bluetooth wireless technology is designed to secure with 128 bit public or private key authentication and stream cipher upto 64 bit providing 5 thick layers of security.



BASIC PRINCIPLES OF Working.

The technology of Bluetooth centers around 9 mm x 9 mm microchip, which functions as low cost & short range radio link. Bluetooth technology provides a 10 meter personal bubble that supports simultaneous transmission of both voice and data for multiple devices. up to 8 devices can be connected in piconet and up to 10 piconet can devices. the gross data rate is 1 mb/s but the actual data are 432 kb/s for full duplex transmission and 384 kbps for tms technology 2000 transmission 721/56 kbps for asymmetric transmission. Bluetooth wireless technology is designed to be as secure as a wire with up to 128 bit public/private key authentication and streaming cipher up to 64 bit based on AES security.

Network Arrangement :-

Bluetooth Network arrangement (topology) can be either point-to-point or can be either point-to-multipoint any unit in a piconet can establish a connection to



another piconet to form a scatter net see the figure, which diagrams a scatter net in which piconet A, which consist of four units, is connected to piconet B, network.

Radio Frequency and spectrum hopping

What if there's lot of radio noise? want that interfere with Bluetooth connections As a Rule, the answer is Number. It is designed to use fast acknowledgement and frequency hopping which will make connections robust.

It is packet based, and will jump to a new frequency after each packet is received, which not only helps limit interference problems, but also add to security data rates are on mega byte/second including headers full duplex transmission (both direction at once) are accomplished via hma division multiplexing the Bluetooth Radio Chip Function at 2.4 gigahertz which is the unlicensed ISM (Industrial Scientific Medical) method.



one megahertz apart, starting with 2.402 & ending with 2.480 (Through the bandwidth is narrower in Japan. France & Spain this spread spectrum is used to hop from one channel to another pseudo-randomly, which adds a strong layer of security, up to 1600 hops per second can be made the standard frequency range is 10 centimeter to 10 meter & can be extended to at least 100 meter by increasing transmission power



BLUETOOTH CORE PROTOCOLS:

Baseband: The baseband and link control layer enables the RF link Bluetooth units in a piconet. This layer uses inquiry and paging procedures to synchronize the transmission between different Bluetooth Devices.

Link Manager protocol (LMP) :-

The link manager protocol is responsible for setting up link channels between Bluetooth device after performing security methods like authentication and encryption by generating, exchanging keys and verifying linking and encryption keys & negotiating baseband & packet size.

Logical link protocol and adaptation protocol (L2CAP)

L2CAP packets and ~~ad~~ carry payloads which are carried to the upper layer protocols.

are queride between Bluetooth etabled devices

Cable Replacement Protocols (RFCOMM)
RFCOMM is a Serial line emulation protocol

Telephony control protocols
the Telephony control-Binary (TCS) Binary and telephony control-AT commands are used to Establish Speech & Data calls betⁿ dvice & control mobail phones & modems Respectively.

Adopted Protocols

Bluetooth also Support PPP TCP/UDP/ID DBEX & WAP protocols to maximize Intropexability

SECURITY

the Security base band Specification defines a Facility of or Link Security between any Bluetooth Devices

consisting of Following Elements

- 1] Authentication
- 2] Encryption
- 3] Key management & usage.



The security algorithms make use of four parameters -

- 1) Unit Address: the 48-bit device address, which is publicly known
- 2) secret authentication
a secret key 128 bit key
- 3) secret privacy -: a secret key of length privacy - 4 to 128 bit

Random number -: a 128 bit random number derived from a pseudo random generation algorithm executed in the Bluetooth unit

The two secret keys are generated and configured with unit & not disclosed

USAGE MODEL

While the Bluetooth usage model is based on connecting devices together, it is focused on three broad categories: voice/data access points, peripheral interconnects

voice / Data Access points

A voice / data access point is one of the key initial usage models & involves



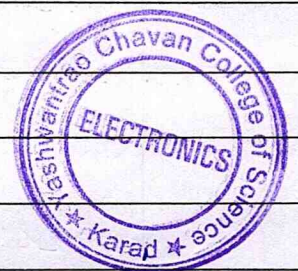
For Example, a mobile computer equipped with Bluetooth technology could link to a mobile phone that uses Bluetooth technology to connect to the internet to access e-mail the mobile phones acts as a personal access points.



Data Transmission :-

Data can be transmitted both synchronously & asynchronously. the Synchronous connection oriented (SCO) method is used primarily for voice and Asynchronous connectionless (ACL) is primarily for data within piconet. different each-master-slave pair can use a different transmission mode & modes can be changed at any time, time Division Duplex (TDD) is used by both SCO & ACL, and both support 16 types of packets that are the same in each type. Because of the need for smoothness in data transmission, SCO packets are generally delivered via reserved intervals, that is the packets are sent in group without allowing other transmission to interrupt. SCO packets can be transmitted without polling by the sending unit. ACL links support both Symmetric & Asymmetric transmission and it is controlled by master unit which determines how much of total each slave unit can use.

Slaves - cannot transmit data until
they have been polled by master &
the master can broadcast-message to
Slave UPPP protocols & usage models RE
comm TCP/IP Base band L2 CAD OBEX
in MC TCS-BLN audiosync Dial-up
net usage model file transfer AT-com-
mands fax headset LAN access cordless
phone SDP LMP nits via ACL Jink.



Personal Area Networking

The last usage models, Personal Area Networking (PAN) focuses on the ad-hoc formation & Breakdown of personal networks & imagine meeting someone in an airport & quickly and securely exchanging documents by establishing a private piconet.

CHARACTERISTICS

Signals can be transmitted through walls & briefcases, thus eliminating the need for line of sight.

- * Devices do not need to be pointed at each other as signals are omni-directional.
- * It separates frequency bands into hops. This spread spectrum is used to hop from one channel to another.
- * which adds a strong layer security
- * Up to eight devices can be networked in piconet.



Advantages of Bluetooth Technology

- 1] No lines of site restrictions as with PDA
- 2] Low power consumption makes integrated in battery powered devices very practical
- 3] 2.4 GHz radio frequency Ensures world wide operability
- 4] Tremendous momentum not only within computer industry but in other industries like cellular telephones & transportation.

APPLICATIONS :

Smart Home

Home equipped with Bluetooth devices manyable to recognize the arrival of its bonafied residents & unblock the door on their arrival. Devices will adjust heat to present ~~the~~ temperature while this is happening the data from individual PDA may be exchanged.



The Internet Bridge

An extension of this model could be a mobail computer that allows surfing the internet irrespective of location of the user.

Automatic check-in

* Hotels are testing, or plan to test service that allows guest to check in undock room doors and even control room temperature.

The three-in-one phone

With Bluetooth support, one headset will be able to provide multiple functionality when the phone comes within range of another mobile phone. With built in Bluetooth technology, it function as walkie talkie



Automatic Synchronization:-

Bluetooth provides the facility of automatically synchronization, notebook & electronic gadgets.

Bluetooth applications in day-to-day life:-

- 1] It can be used in refrigerator so as to intimate when food supply is low
- 2] Bluetooth chips in freight containers to identify cargo when a lorry drives into depot

Disadvantages of Bluetooth

there are some important disadvantages of Bluetooth are given below.

- 1] It can base connection in certain condition.
- 2] It has low bandwidth as compared as compare to wi-fi
- 3] It allows only short Range communication between devices
- 4] Security is a very key aspects as it can be hacked.



FUTURE SCOPE

Bluetooth is a continually expanding technology, there are plans to add many new application profiles with over 1800 companies working on Bluetooth, the future could further be brighter & with any further developments of technology we can create miracles in the field of the COMMUNICATIONS with a strong special interest group with a strong special interest group behind Bluetooth the standardization of application profile is almost assured.

