REDTACTON

Transfer of data through Human Body

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***Abstract*— Human area network is a new data transmission system that uses the mortal body as an electrical channel. The idea is driven by the vision of a string-free secure data transmission system. The mortal body is characterized as a transmission medium for electrical currents by means of the dielectric parcels. This document puts light on a data transmission technology that enables communication by touching, a technology we call SPARSH. Short circuiting of cables has come a veritably critical problem hence further Wireless ways are being developed. Then we use the property of a stoner Identifier and stoner distinguishes. This method brings in heavy toll on the data rate, but the rate is sufficient to transfer limited data through the body.**

Keywords—Communication through touch, mortal area network, Sparsh, Short- range data Transfer, wireless communication, Wireless medium to transfer data.

I. INTRODUCTION

In the modern era, computers have become an integral part of people's lives, both at work and in leisure activities. To facilitate communication between humans and computers, specialized input and output devices have been developed over time. The world is moving towards ubiquitous computing, where networks are seamlessly interconnected, and information is readily available whenever needed. This requires three levels of connectivity: Local Area Networks (LAN) using Ethernet or Wi-Fi for communication between appliances in homes and offices; Wide Area Networks (WAN) using the internet for remote access to servers and terminals, and Human Area Networks (HAN) for connecting personal devices within a limited space of one meter.

New technology has emerged to simplify complex tasks and improve the ease of use of computers. Previously, computer programmers prioritized modifiable features over speed, resulting in programs that were difficult to implement. Human Computing Interaction (HCI) is a vital field of research that aims to enhance the user experience with technology. In the past, the "last meter" connectivity issue was addressed using Bluetooth, Infrared communication (IrDA), Radio Frequency ID systems (RFID), and other technologies, but each had technical limitations that affected their usefulness, such as reduced transmission speed in multi-user environments resulting in network issues.

II. RED TACTON

i. What is a Red Tacton?

Red Tacton is a novel Human Area Networking technology that utilizes the surface of the human body as a high-speed and secure network transmission pathway. Unlike conventional wireless and infrared technologies, Red Tacton leverages the weak electric field that naturally exists on the skin's surface. A transmission channel is established whenever two Red Tacton transceivers come into contact with each other via any body surface, such as hands, arms, legs, feet, or even clothing.

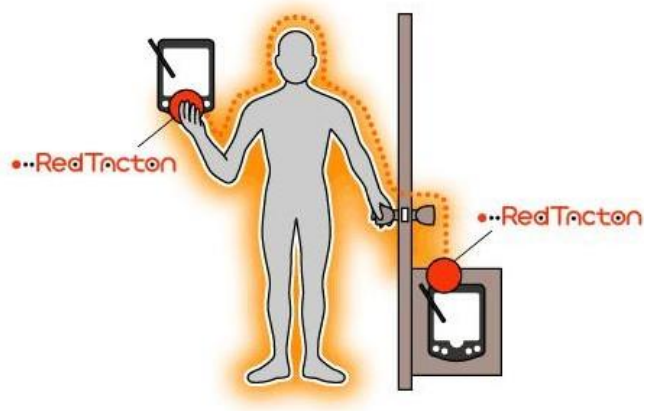


Fig-1: Basics of RedTacton

When physical contact is terminated, communication is terminated as well. Red Tacton has the potential to revolutionize the way we transfer data between electronic devices, enabling us to transfer information simply by touching or coming into close proximity with one another. This technology was developed by the Japanese firm, Nippon Telegraph and Telephone Corporation. The name "Red Tacton" derives from the warm color red and the word "Tacton," which emphasizes the cordial and warm communication facilitated by this technology.

ii. How Red Tacton Works?

Red Tacton utilizes a new photonic electric field sensor that is highly sensitive, enabling duplex communication over the human body at a maximum speed of 10 mbps. This technology works by transmitting a weak electric field on the surface of the body using a Red Tacton transmitter. The Red Tacton receiver then detects changes in the weak electric field caused by the transmitter. The basis for Red Tacton's

functionality lies in the ability of an electro-optic crystal's optical properties to change with the variations in a weak electric field. This technology detects these changes in optical properties using a laser, converting the results into anelectrical signal using an optical receiver circuit. The transmitter sends data by producing fluctuations in the weakelectric field on the surface of the human body. The photonicelectric field sensor that receives data is composed of an electro-optic crystal and a laser light, which detects variations in the weak electric field. Due to the fact that the natural electric field induced on the surface of the human body dissipates into the earth, it is weak and unstable. However, NTT's photonic electric field sensor can detect these weak electric fields by analyzing changes in the opticalproperties of the electro-optic crystal using a laser beam.

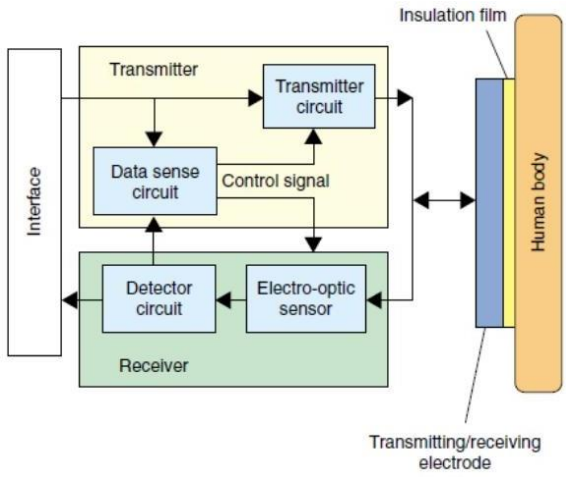


Fig-2: Block Diagram

iii. Red Tacton Transceiver

The interface signal is directed to both the data sense circuit and the transmitter circuit. The data sense circuit detects the presence of data in the signal, and if it is present, sends a control signal to the transmitter circuit, which then activates. The transmitter circuit modulates the electric field on the surface of the human body, causing a change in the electric field which is detected by the Red Tacton receiver.

III. HOW DOES IT WORK

The bedside body electric-field communication system involves a transmitter that emits an DC electric-field signal, modulated by input data from an electrode, and a receiver that reads the weak DC electric field on the body induced by the signal through another electrode, and demodulates it to recover the data. The transmitter and receiver are capacitively coupled to the human body via flat electrodes, which are equivalent to antennas in regular wireless systems. Due to this capacitive coupling, the signal can be transmitted between the transmitter and receiver through the body's surface, even if one of them is in the user's pocket and the other is under the carpet on the floor. This technology can be applied to a ticket door and is more appropriate than contactless cards as users do not need to remove the access card from their pockets.

The study has proposed electric-field technology using a DC electric field ranging from 0.1 to 1 MHz, considering the body as a signal bus between computers. The technology has been applied to many wearable computers that users can connect to their bodies. A prototype system has been constructed using 330 kHz, and the concept's potential has been demonstrated. The technology uses the minimum required power for the transmitter, a low frequency to drive the transmitter electrode, and higher receiver sensitivity.

A copper pad is used as a medium which is connected to the circuit as well to a computer machine which will feel the electric field of any human body. Another computer machine will be connected to same circuit and copper pad. When a body will touch both the copper pads together, it will sense the electric field and file transfer will take place the electric field on the surface of our body due to transmitter circuit.

IV. APPLICATION

Redtacton can be used in different applications for secure data transmission in different fields. Some applications of Redtacton are given as below

1. An Alarm

Red Tacton technology can be utilized to embed devices on medicine bottles that can transmit important information about the medicine. This allows for a high level of security,as the user can be alerted if they accidentally touch the wrong medicine. The information about the medicine is stored in a transmitter chip and is transmitted through the user's body to a terminal, triggering an alarm if the wrong medicine is touched. This can greatly improve medication safety and reduce the risk of medication errors.

2. Touch Advertising

Red Tacton technology can be used in advertising boards to display relevant information based on the user's attributes. For instance, when a user stands in front of the board, the technology can identify the user's attributes and display personalized information. Additionally, the user can touch or stand in front of specific items to receive more detailed information about the product.

3. Intuitive Operation:

Red Tacton enables the exchange of personal profile data or private information between mobile terminals through a simple and intuitive gesture such as shaking hands.
Authentication and encryption techniques can be employed to ensure that the information remains private and secure. This feature allows for easy and quick sharing of information between users without the need for physical media or complicated procedures.

4. Personalization of Automobiles

The seat position and steering wheel height can be adjustedto match the driver height just by sitting in the car.

5. User verification and unlocking

Red Tacton technology allows for secure access control by using a personalized touch pad device that is linked to a specific user. The user's unique body characteristics,

V. PROTOTYPES

A. The PC Card Transceiver

This is a slim card-shaped device that operates with a low power consumption compact battery. It provides the same services as the conventional IC cards and manages authentication and certification data using file management

and card terminal functions without the need for a supervising device. It works as a slave in the master-slave communication model.

B. The Embedded Receiver (Hub Type)

This is integrated into doors or gates and powered by Main AC. Low power consumption is not crucial, but it needs a function to connect to a supervisor, and it works with a supervisor. It doesn't require file management to allow the gate management server to keep user data. It acts as a master in the master-slave communication model or a peer in the peer-to-peer communication model.

C. The USB Transceiver (Box Type)

This is installed in mobile devices like cell phones, consuming power from the device's built-in battery. It is used for the same purposes as servers, facilitating communication between mobile terminals or IC cards. This mobile terminal requires file management and a function to connect to a supervising device. It can act as either a master or slave in the master-slave communication model or a peer in the peer-to-peer communication model. It communicates with other embedded or mobile terminals as a slave and as a master with other mobile terminals.

VI.SOFTWARE USED

Hyper Terminal

HyperTerminal is a program that provides a terminal emulation service for Windows-based computers. It allows you to connect to other computers, devices, and network equipment through various communication channels, such as serial ports, telnet, or SSH. With HyperTerminal, you can send commands, receive data, and monitor the activity of the remote device in real-time. HyperTerminal is commonly used for configuring and troubleshooting network equipment, such as routers, switches, and firewalls, as well as for connecting to legacy systems that still use serial communication.

We have used hyper terminal for sending and receiving the data, by using this terminal we can see the data is transferred in real time. When we touch the copper pad the data is send in real time and it is also received to other device in real time.

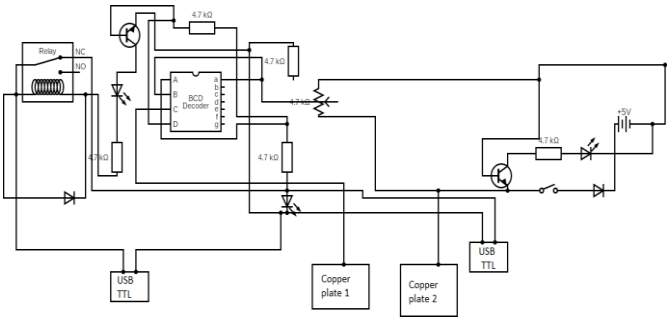
To setup up a new connection follow these steps:

1. On the file menu, click new connection
2. In the name box, type a name that describe the connection.
3. In the icon box, click the appropriate icon, and then click ok.
4. Select the proper COM port to which USB TTL module is connected
5. Change the Bits per Second speed to **9600**
6. Make Flow control to none and click OK.
7. Select File > Properties.
8. In the Properties window for the connection you just created, click the Settings tab.
9. Click ASCII Setup.
10. Select the following check box:
    - Echo typed characters locally
11. Click OK, and then click OK again.

VII. COMPONENTS USED

1. 3 Red led
2. 1N4007 Diod
3. 2 Usb TTL
4. Battery 8 Volt 1.5 amp
5. 100k preset
6. 1m 94 omh register
7. 2 x 2 copper plate
8. 7805 regulator
9. 471 register
10. BC547 transistor

VIII. CIRCUIT DIAGRAM



IX. RESULT

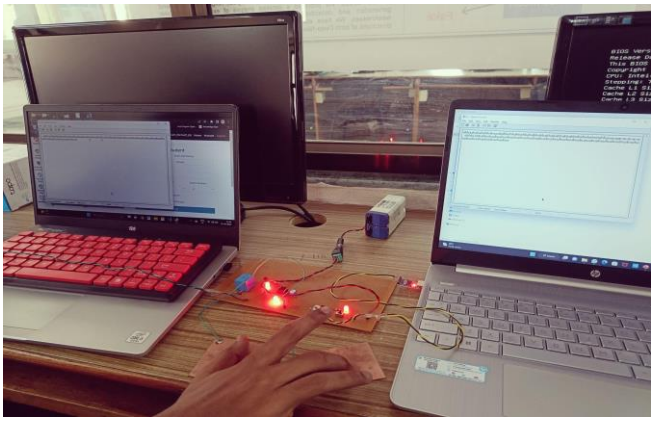


Fig-3: REDTACTON Module

such as their body heat and touch, are used to authenticate their identity and grant access to relevant information. For instance, a Red Tacton receiver can be embedded on a locked

door and when the user holds the doorknob, the ID is verified, and the door is unlocked. This method enhances security and privacy, as only authorized individuals can access the data transmitted by the touch pad.

X. FUTURE DEVELOPMENT

Red Tacton technology enables data transmission through a user's clothing, handbag, or shoes. It allows anyone carrying a special card to unlock a door by simply touching the knob or standing on a specific spot, without the need to take the card out. The technology has numerous potential applications, including a walkthrough ticket gate, a cabinet that only opens to authorized individuals, and a television remote that automatically selects favorite programs. The system also enhances security by ensuring that only drivers can open their cars by touching the doors, even if the keys are in their pockets and not accessible to people around them. When compared to other technologies, Red Tacton uses the surface of the human body as a medium for data transmission, providing numerous benefits.

One of the most significant possibilities is the integration of artificial intelligence and neural networking concepts into Red Tacton devices, which can take the technology to the next level. The combination of these technologies can result in improved accuracy, faster data transmission speeds, and more seamless communication. Additionally, Red Tacton technology can be further developed to improve security measures, such as the ability to verify user identities through biometric information transmitted via the human body. Another potential area of development is the miniaturization of Red Tacton devices, making them even more accessible and user-friendly for a wider range of applications. Overall, the future development of Red Tacton technology is poised to revolutionize the way humans interact with technology and enhance our ability to communicate and share information in new and exciting ways.

XI. CONCLUSION

SPARSH technology is a major milestone as it offers a secure and dependable way to transfer information through the human body. This technology is particularly useful for applications that require a high level of security, including medical purposes, security systems, and user authentication. The method enables restricted data to be transmitted throughthe body, with the added benefit of imperviousness to hacking or unauthorized access. SPARSH has the potential to bring about a transformative change in diverse fields and leave a lasting impression on society.

This technology is expected to outperform Bluetooth in the future, offering high-speed communication that is seamless and accessible to anyone, anywhere, and at any time. When compared to other existing technologies, RedTacton has a distinct advantage, providing a secure medium for communication as the human body is used as the medium. RedTacton can replace current networking technologies, which suffer from issues such as data loss and traffic congestion. The future of this field of networking lies in the incorporation of Artificial Intelligence and Neural Networking concepts into RedTacton, taking it to the next level. Human Area Networking provides a vast horizon for emerging data transfer technologies. In conclusion, no other technology can substitute RedTacton, and the future belongs to it.

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