Data Transmission Body as a Medium SPARSH – Human Area Network

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ABSTRACT
Human area network is a novel data transmission method that uses the human body as an electrical channel. The idea is driven by the vision of a cable-free secure data transmission system. The human body is characterized as a transmission medium for electrical currents by means of the dielectric properties. This paper describes a data transmission technology that enables communication by touching, a technology we call SPARSH. Because of the routing of cable problem the communication between terminals is clearly inconvenient. When transmission of data takes place over the radio channel, data speeds are reduced by packet collision and the security risk from unwanted signal interception is another problem. A technique for solving such problem includes the use of the person body as a signal path for data transmission. The transmission of the data takes place when the human body comes in contact with a device and communication between mobile terminals begins.

Keywords: data transmission body as medium, SPARSH, human area network, HAN

I. INTRODUCTION
SPARSH is a technique that uses the human body as a transmission medium. The concept is to use a human body as a communication channel among mobile computing terminals with which a human is equipped. This technique is not limited to communicate between mobile terminals. It is also suitable for communication between mobile terminal and other embedded in environment.

In this paper, we try to illuminate the principles of human area network for data transmission. Section II explains the background overview of the system. Section III explains the basic setup requirement and experimental setup for SPARSH technique. Section IV gives conclusion.

II. BACKGROUND OVERVIEW

A. Existing System
In today’s world, people can communicate anytime, anywhere, and with anyone over a cell phone. Also, they can transmit the data over the wired network or wireless network. Now a day’s most of the data transmission is performed using wireless network or Bluetooth for mobile to mobile communication. For PC to mobile or PC to PC communication wired network is used.

B. Drawbacks of Existing System
The typical drawbacks of the existing system are as follows: First, routing of the cable for wired network. Second, the wireless network is not secure because of the data signal are radiated outward. Third, data transmission speed is less because of the packet collision and security risk from unwanted signal interception. Fourth, the power consumed by the system is more.

C. Proposed System
The drawback of the existing system is eliminated using SPARSH because in this system data is transmitted using body as a medium. By touching the hardware connected with the device we are able to transmit the data. Here, we are eliminating the problem of routing cable, radiation of signal because the data is transmitted within the body, it is the secure transmission because no unwanted signal interception, and the power consume by the system is also reduced. Considering these advantages, SPARSH is a promising candidate for the forthcoming ubiquitous computing era.
III. THE PROPOSED SYSTEM

A. SYSTEM REQUIREMENT
The above proposed system will be divided into the following sub modules or sections...

B. EXPERIMENTAL SETUP:
The Basic Experimental Block Diagram of the system is given below.
C. Explanations of Blocks

The following are the brief explanations of the working principle of the various major blocks or sections used in the system…

- **Bluetooth**
  Bluetooth appears to be a different way to build up connections between devices placed in proximity. This radio frequency technology can be thought as a cable replacement technology that will not only replace cables, but be the base to developed next generation wireless applications, which will be built upon this technology. It offers a variety of other services, apart from connecting devices, and it creates opportunities for new usage models. Here we are using RN-42 as Bluetooth model.

- **Mobile Phone**
  In this device we are creating application for the communication of the Bluetooth device and for the GUI interface for the user to send the data and check the received data. Here we are using JAVA ME platform to create the application.

- **Power Supply**
  This unit will supply the various voltage requirements of each unit. This will be consists of transformer, rectifier, filter and regulator. The rectifier used here will be Bridge Rectifier. It will convert 230VAC into desired 5V/12V DC.

- **ARM 7**
  This unit is the heart of the complete system. It is actually responsible for all the process being executed. It will monitor & control all the peripheral devices or components connected in the system. The controller here user will be of LPC21XX family. The code will be written in Embedded C and will be burned or programmed into the code memory using a programmer. This unit requires +3.3VDC for its proper operation.

- **Touch Pad**
  This unit will provide the touching facility. When the person touches the touch pad on both the side it will transfer the data from one end to the other end and it will display on the mobile device.

- **Amplifier**
  This is the device which is used to amplify the received signal to increase the strength of the signal. Here we are using LM358 as amplifier. This unit requires +5VDC for its proper operation.

D. Project Development Methodology or Steps

The following will be development steps so as to achieve the working Prototype Model of the above proposed system…

- Defining the Problem,
- Understanding the Need & Usability in industry and society (Market Analysis),
- Developing Block Diagram,
- Designing Circuits of individual blocks,
- Testing circuits in LAB & Finalizing,
- Developing PCB on PC,
- Getting the PCB printed from market,
- Soldering the components,
- Performing various Basic Experiments to test the PCBs,
- Developing Flowchart for the entire process,
- Writing actual Software Program,
- Compilation & Burning,
- Testing and Debugging,
- Writing actual code.
- Finally Running the system and,
- Documentation.

IV. OPES & APPLICATIONS

Only the imagination can limit the applications of the above proposed system. Though the following are some examples…

- Sensitive data transmission
- Private information transmission.

V. CONCLUSION

By the realization of the above proposed system one can learn many aspects of a digital electronics circuit. This will give the complete knowledge of designing system by which transmission of data is possible using body as medium and developing embedded software. We will also learn the software development strategies and various programming techniques for mobile based application.

REFERENCES


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Authors Biography

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