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Remote Patient Monitoring in Telemedicine using computer communication network through Bluetooth, Wi-Fi, Internet Android Mobile

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Abstract: Mobile telemedicine is to provide a medical monitoring for the patient at any time, if there is any abnormal change of his/her pulse rate/temperature data. It provides sustained communication for data transmission. Mobile telemedicine brings the convenience and reduced cost. The main purpose is to maintain record of patient data and to give emergency alert if required. We developed android Bluetooth API is to construct a simple peer-to-peer messaging system that works between two paired Bluetooth. At monitoring center android phone receives the data through Bluetooth, WI-FI and Internet This application is mainly used to send data to doctor, so that user can able to send and receive information[1][2][3].

Keywords: Mobile telemedicine, internet , ICT, Bluetooth, WI-FI and Internet

I. INTRODUCTION

Low bandwidth in 2G, so transmission delay is happened in transmission and receiving of biomedical signals using internet. Maintenance and expensive cost is very high using satellite based communication. Expensive of Satellite based Ambulance telemedicine van is high so it could not use in poor people of rural area..

II. PROPOSED SYSTEM

The 3G or 4G internet of bandwidth is high so the transmission and receiving of bio signal is normally speed and avoid delay. The bio signals(ECG,EMG,EEG)are transmitted in video stream through internet and automatically reduce noise by internet communication. Here no need antenna in Ambulance . Here 3G or 4G internet is used in Ambulance the internet helps the transmission of all bio signals using mobile communication. Cost of Antenna expense is reduced by using internet mobile that canbe implemented in poor people of rural area. Mobile based telemedicine can transmit any place in any time. The big data of X-rays and scanning reports and patient details also stored in cloud using internet mobile and reduced 80% expensive of storage of server cost. The monitoring of patients observation is flexible in large size of Mobile phone (mobile pad).

III . MODEL OF MOBILE TELMEDICINE

Telemedicine is the effective fusion of Information and Communication Technologies (ICT) with Medical Science with Real time interactive Telemedicine medical service. The purpose is to maintain record and monitoring the patient details and to give emergency alert if required.

- Bluetooth module capable of transmitting information to processing. At monitoring center android phone receives the data through Bluetooth module.It helps to monitor patients to to remotely and secure their lives by giving emergency alerts.
- Server stores the patient detaials whenever the patient contact doctor,they will retrieve required datas from the server.
- The datas was sended through message.Doctor will diagonize the problem by means of reading values sended by the user.

The monitoring center is monitoring the Bio medical signals (ECG, EMG, Pulse) and Blood pressure and temperature. From the remote medical monitoring unit patient's pulse rate sensor is going to sense the pulse values particular person and temperature data is taken and given to the ADC. ADC converts this analog data into digital format and sends to the controller, controller will process this data and transmits continuously to the monitoring center via Bluetooth module then monitoring center take relevant steps for the signals . The Block diagram of Patient Monitoring using Mobile telemedicine as shown in Figure 1.

A. BioKit

It consists of microcontroller with the embedded operating system, a custom sensors board, and a Bluetooth module capable of transmitting information to processing centers. From the remote medical monitoring unit patient's pulse rate sensor the controller, controller will process this data and transmits continuously to the monitoring center via module. The blue tooth bio-kit as shown in figure 2.

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B.Benefits of telemedicine:

- Improved access to patient.
- Reduced cost for patients.
- Reduced Isolation for doctors.

bluetooth module then monitoring center take relevant steps for the signals. At monitoring center android phone receives the data through Bluetooth

IV EXPERIMENTS RESULTS

The Mobile system uses 3G internet to transmit video, audio and patient's bio-signals(ECG, EMG, Pulse, respiration and monitoring temperature , Blood pressure as shown in figures 3,4.5 The Patient's biomedical signals monitoring from moving ambulance to a hospital and delivers to the personal computer of the doctor. The patient bio-signals are noninvasive blood pressure (NIBP), arterial oxygen saturation (SpO_2), respiration pattern, electrocardiogram (ECG), heart sound, body core temperature and blood glucose concentration. For the emergency medicine, vital signs are focused and the remote medical monitoring, consulting, and health care are intended.

The mobile telemedicine system was implemented and tested for real time medical consultation during ambulance transport. This PC based mobile telemedicine system is flexible enough to accommodate newer components in wireless communication and portable sensing technologies. The present study suggests that the mobile telemedicine system using CDMA 1xEVDO is aids to patient monitoring and diagnosis as well as a convenient means of communications in the ambulance for the emergency medical care[5].

V. CONCLUSION

This paper proposes the design and implementation of a Internet mobile telemedicine system, in which transmitted biomedical signal like ECE, EMG, pulse, respiration to remote medical server through internet of 3g or 4G to both cellular networks in emergency patient monitoring[1][2][3][4][5].

The cost of using GSM/GPRS network is reduced using Android cell phone In the future, a lot of work could be done in by mobile telemedicine systems to enhance the healthcare services in ambulance using 4G mobile networks provide bandwidth up to 100 Mbps maximum. This will enable the transmission of more information like ECG, EMG, Pulse when monitoring cardiac patients from a moving ambulance vehicle[5].

Furthermore, video conferencing can help with communications between a healthcare provider and an expert doctor. The current activities in 4G mobile networks promise ubiquitous access to differing radio network technologies, thus offering, beyond extended coverage, also the most effective connection mode at the point of contact, converts this analog data into digital format and sends

even using simultaneously more than one wireless access technologies and seamlessly moving between them.

The use of locating systems such as the global positioning system (GPS), the geographical information systems (GIS), and intelligent traffic control systems also has the potential to improve healthcare services, for example, when a moving ambulance vehicle is trying to reach a patient using the fastest route or when an ambulance vehicle carrying a patient is trying to get to the base hospital [5].

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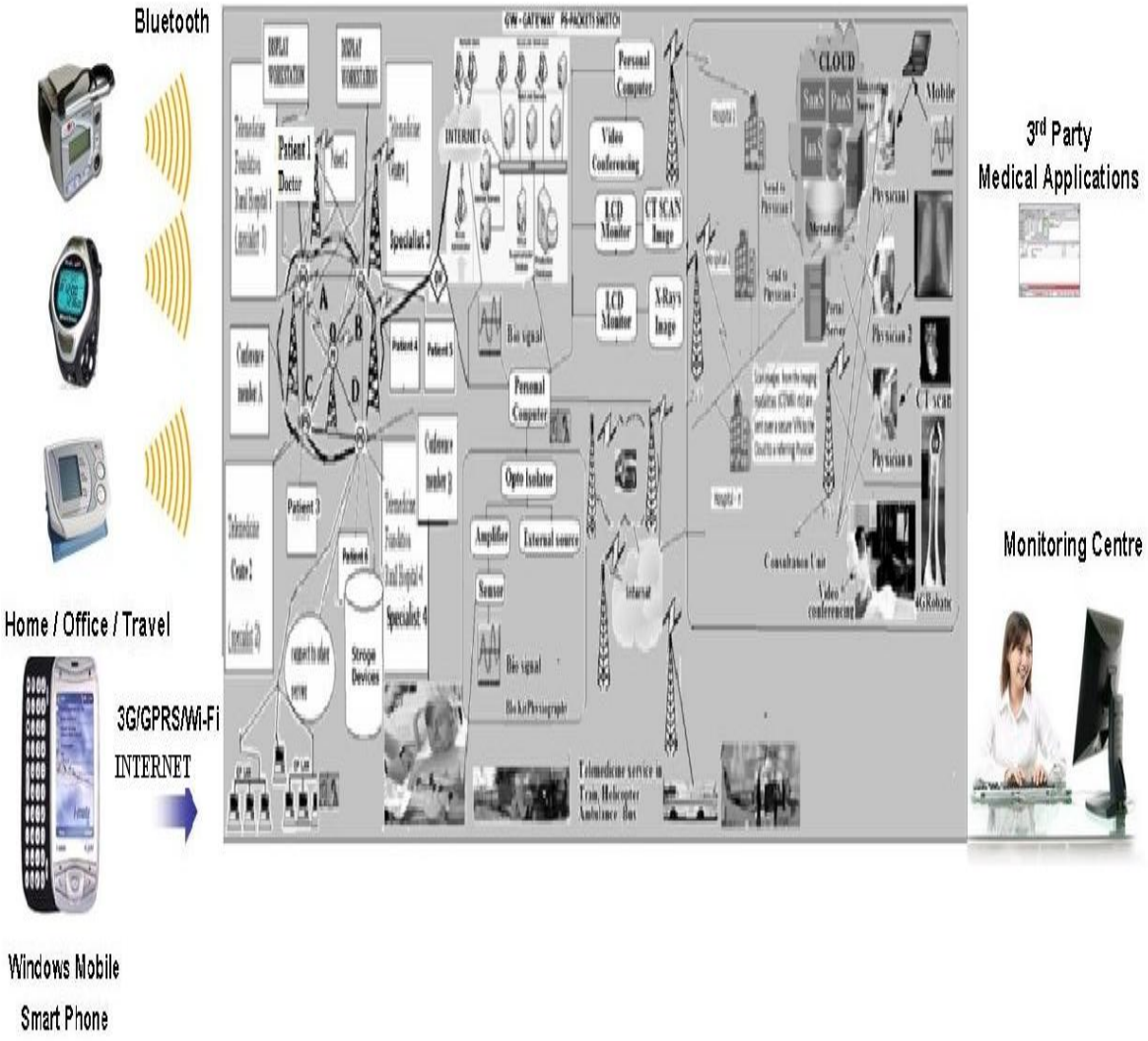

Fig1. Block diagram of mobile telemedicine

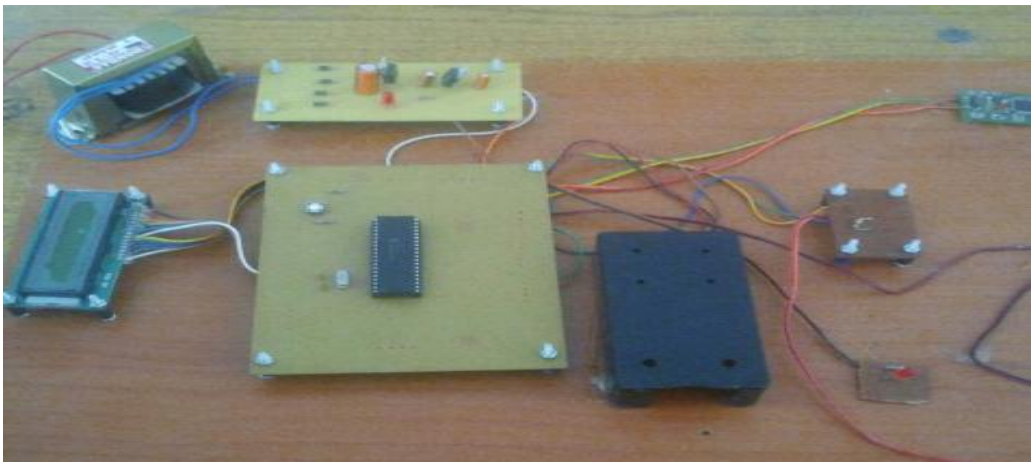

Fig 2. BioKit Of Physography

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Fig 3. The patients monitoring using mobile and Laptop computer

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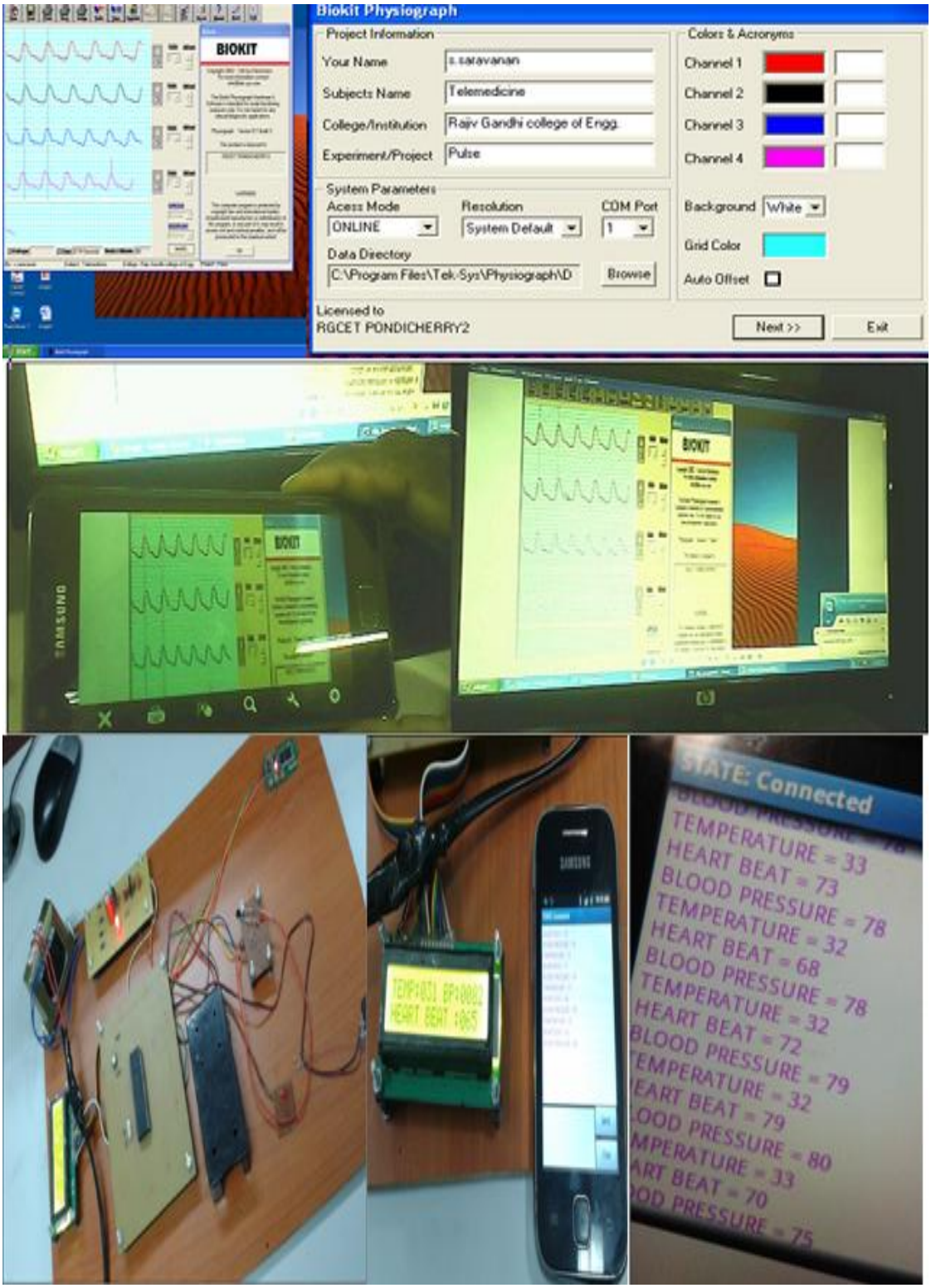

Fig 4. The Pulse, Temperature, Blood Pressure are monitoring Bluetooth mobile and 3G inter mobile.

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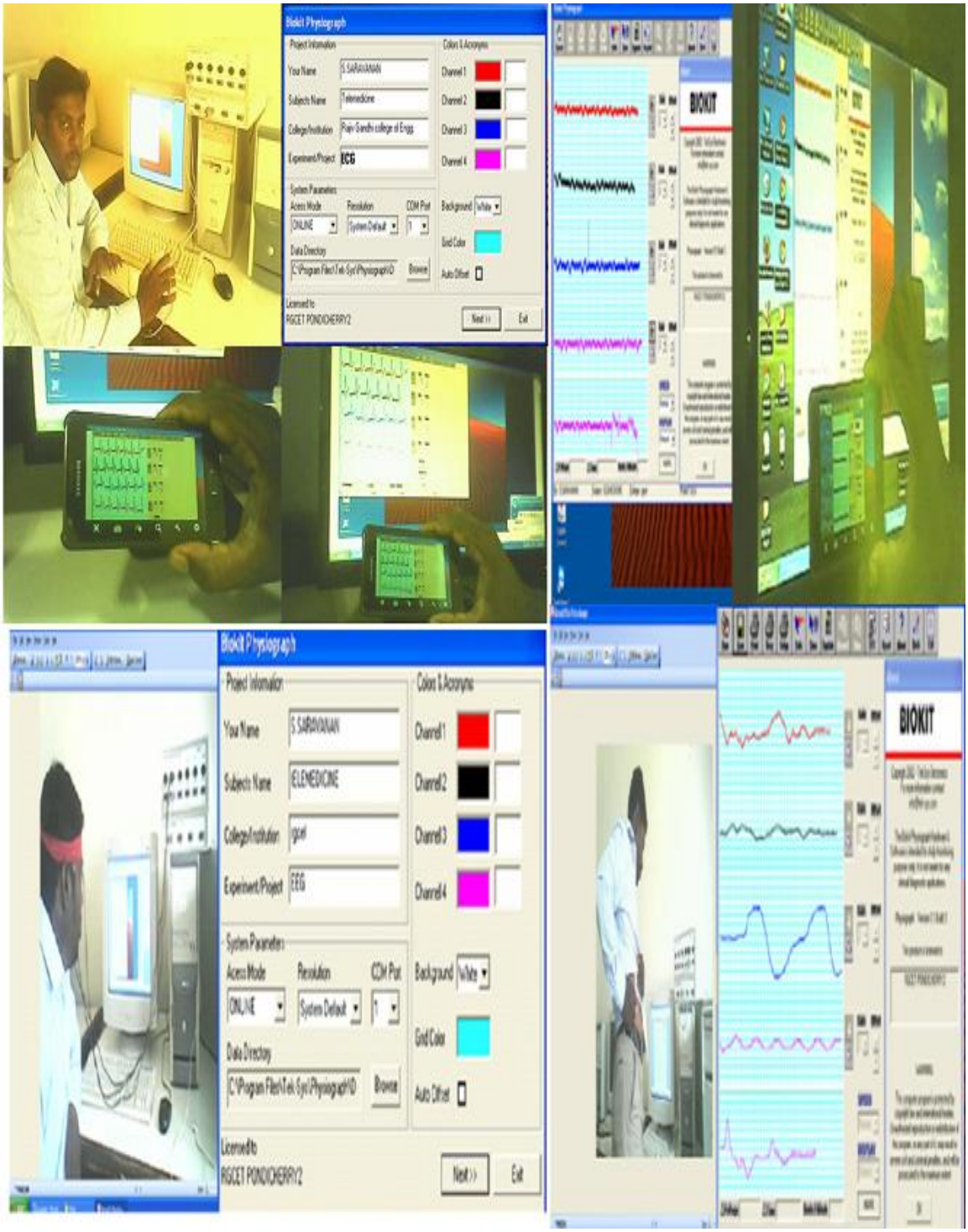

Fig 5. The ECG, EMG, Respiration signals are monitoring using 3G internet Mobile

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research in Computer Science and Software Engineering Research Paper Available online at: www.ijarcsse.com Emergency Telemedicine Service using Computer communication Network and 4G Mobile Networks through Internet Challenges in CloudComputing Systems to Ambulance bus and Consultancy S. Saravanan Asst. Professor in, CSE Dept, Rajiv Gandhi College of Engineering and Technology, Affiliation by Pondicherry University, India

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