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Embedded Based Detecting Biometric Signals

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ABSTRACT

Biometric signals are measurements of the body's most basic functions. The main biometric signals routinely monitored by medical professionals and healthcare providers include the ECG,Heart rate, Blood pressure. biometric signals are useful in detecting or monitoring medical problems. It can be measured in a medical setting, at home, at the site of a medical emergency, or elsewhere. The proposed system enables with ECG, Blood pressure, Heart rate of normal and abnormal images are given as an example to predict the conditions of the patients very quickly and easily. Thus, such biometric signals monitoring systems will reduce health-care costs by disease prevention and enhance the quality of life with disease management. The simulation results are obtained with the help of Integrated Unified Technology Learning Platform [UTLP] hardware kit. UTLP is a special purpose processor designed to perform real time processing and control operations. This will reduce time consumption, manual work risk factor and other inconveniences and provides effective operation

Keywords: ARM8, ECLIPSE, SENSORS.

I.INTRODUCTION

During the last few years that witnessed an increasing interest in wearable/mobile health monitoring devices, both in research and industry. These devices are particularly important to world's increasing population. whose health has to be assessed regularly or monitored continuously. Patient monitoring is to have a quantitative assessment of the important physiological variables of the patients during critical periods of their biological functions. For diagnostic and research purpose, it is necessary to know their actual value or trend of change.

Patient monitoring systems are used for measuring continuously or at regular intervals, automatically, the values of the patient's important physiological parameters. Biometric signal**s** are important indicators of the body's response to physical, environmental, and psychological stressors. Proposed system aims to improve this and monitor the condition of patients very quickly and easily by using UTLP which works on Eclipse software. Biometric signals provide the identification of an individual based on the physiological and behavioural characteristics. Analysis of electrocardiogram (ECG) as a tool for clinical diagnosis has been an active research area in the past decades. The drawbacks of the methods are conversion of ADC to analyze the signal is very difficult and there is a chance of occurring loss of signals. In the proposed system, biometric signals (ECG signal, blood pressure and heart rate) are monitored at all conditions (normal and abnormal) with the support of ARM processor. It will get signals from the sensors and controls the entire process. The simulated result of ECG signal, blood pressure and heart rate are executed in embedded OS. This will reduce time consumption, manual work, risk factor and other inconveniences and provides effective operation.

II LITERATURE SURVEY

F.A. Castano *et al* [1], describes the design of a wearable device for measuring vital signs, oriented to monitoring applications and home healthcare. In order to improve the living conditions

of the patient, device allows that the patient can perform their daily activities while their health is monitored. The designed device allows measuring electrocardiogram, blood oxygen saturation, non-invasive blood pressure and heart rate. This paper proposes a novel technique to reduce motion artifacts based on signals measurement redundantly at clinic level. The device transmits the information wirelessly to a proprietary application for viewing, the result of used technique for reducing artifacts and a prototype of the device is presented.

Divyesh Dixit. *et al* [2], described the vision and on-going research in creating ubiquitous computing support for medical work in the hospitals and health assistance technology for the future. In the recent decades health related issues are becoming more and more critical. This highlights the need of continuous monitoring of health parameters of the patient. Today, clinical computer systems seldom play any role in the execution of execution of clinical work as such. Similarly the handy health monitoring electronic equipment do not help in maintaining health logs, analysing data and assisting depending on the analysis. Electronic Patient Records (EPR) are confined to the hospital database.

Htoo Aung Maw *et al* [3], presented wireless sensor Networks have recently attracted much interest in the research community because of their wide range of application for WSNs involves their use in healthcare medical sensor networks(WMSNs).In a hospital, outfitting every patient with tiny, wearable, wireless vital sign sensors would allow doctors, nurses and other caregivers to continuously monitor the state of their patients. In such a scenario, patients are expected to be treated in reasonable time, real-time access to comprehensive medical records and detect unauthorised access to sensitive data. In emergency situations, a doctor or nurse needs to access data immediately. The loss in data availability can result in further decline in the patient's condition or can even lead to death.

Isabelle Texier *et al* [4], project aims for developing an integrated autptuaonomous device for monitoring and personalized management of chronic wounds, mainly diabetic foot ulcers and venous leg ulcers. Most foot and leg used ulcers are caused by diabetics and vascular problems respectively but a remarkable number of them are also due to the co-morbidity influence of many other diseases. More than 10 million people in Europe suffer from chronic wounds, a number which is expected to grow due to aging of the population.

Clement Ogugua *et al* [5], proposed the techniques to measure the changes in human body hydration leading to excess fluid losses or overloaded affects the body fluid's ability to provide the necessary support for healthy living. We propose a time dependent circuit model of real time human body hydration, which models the human body tissue as a signal transmission medium. The circuit model predicts the attenuation of a propagating electrical signal. Hydration rates are modelled by a time constant t which characterises the individual specific metabolic function of the body part measured.

Poonam Kaur *et al* [6], proposed a system variations in ECG Parameters can be extremely fatal, if not detected at early stage. Lab view based virtual system presented in the work helps in detection of heart rate. ECG abnormalities and consequent estimation of related disease using various modules. Modules required for ECG signal acquisition, processing, display of heart rate and possibilities of related disease have been designed using labview virtual instruments. The designed system in advantageous in automatic removal of filtrations of acquired signal on virtual cardiographs and detection of p wave, QRS compel, T wave and their onset and offset with iso level and ST level elevation. This designed have been tested on ECG database obtained from physionet.

Manoj Mathurkar. *et al* [7], described embedded based patient monitoring and clinical analysis in generic architecture to design the autonomous system in a cumbersome and expensive task. Unifying the Biomedical engineering this paper proposes one kind

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of noise and filtration of embedded system named Biomedical Application of Embedded System for Malnutrition using ARM 7 processor. This system can achieve the purpose of long distance real time monitoring of malnutrition. This paper will help in exploring and exploiting new opportunities in the emerging interface between computer and healthcare. An effective solution is provided to develop the intelligent system which will monitor various parameters of human being and will send this data to the authorized user is explained.

Kaleem Ullah *et al* [8], discussed recent advancements in technology and the availability of

III. HARDWARE DESCRIPTION

To predict the condition of the patient as easily, images of the patient's different biometric signals are designed using Eclipse software to work with Unified Technology Learning Platform.

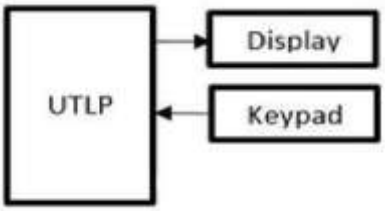

Figure1.1 Layout

The above figure shows the layout of UTLP kit.Where the normal and abnormal images are predicted very correctly. The images are predicted by the doctor's knowledge. If the images of blood pressure, heart rate

the Internet make it possible to connect various devices that can communicate with each other and share data. The Internet of things (IOT) is a new concept that allows users to connect various sensors and smart devices to collect real-time data from the environment. However, it has been observed that a comprehensive platform is still missing in the e-health and m-health architectures to use smartphone steed sensors to sense and transmit important data related to a patient's health. In this paper critically evaluate the existing literature, which discusses the effective ways to deploy IOT in the field of medical and smart healthcare.

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Simulation Results

Simulation has been done for the proposed system to check its sequence and concepts are verified with its results. Coding for images and simulation output are shown below. For the purpose of simulation, instead of connecting real sensors sample values were given and output results were tested.

Simulation Coding

```
#include "macros.h"

#include <stdio.h>
#include <ulk.h>
//Access images
 #include'1.bmp.h''
#include'2.bmp.h''
#include'3.bmp.h''
#include'4.bmp.h''
#include'5.bmp.h''
 #include'6.bmp.h''
int main (void) PROGRAM_ENTRY;

//Image Enhancement predefined parameters
    #define BRIGHTNESS_STEP 20
    #define CONTRAST_STEP 1.2
    #define BINARY_THRESHOLD 127

//Pixel RGB components
 Struct Colorpixel
{
  Unit8 red;
 Unit8 green;
 Unit8 blue;
 Unit8 reserved;
};
          void load image(int);
          void adjust brightness(int);
          void adjustcontrast(int);
          void converttogray();
          void negativeimage();
          void binary image(void);
          void tokeypadmode(void);

int main()
  {
 unsigned long option;
is loaded =0;
ulk_proc_clcd_intit();
ulk_fpga_clcd_intit();
ulk_proc_clcd_intit();
while(1)
{

  ulk_cpanel_printf("\program menu\n");
ulk_cpanel_printf("\1.load image\n");
ulk_cpanel_printf("\2.image processing\n");
ulk_cpanel_printf("\3.negative image
conversion\n");
```

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```
ulk_cpanel_printf("\4.binary image
conversion\n");
ulk_cpanel_printf("\5.change to
keypadmode\n");
ulk_cpanel_printf("\6.exit\n");
ulk_cpanel_printf("\enter your option\n");
ulk_scanf_hex(&option);
switch (option)
{
            case 1:
                  load image(0);
            break;
            case 2:
                  if(is loaded==0)
                  {
                  ulk_cpanel_printf ("\nimage not
yet loaded \n ");

Else
{
        ulk_proc_clcd_display_string("\image
processing ");
 converttograyscale();
}
Break;
 case 3:
                  if(is loaded==0)
                  {
                  ulk_cpanel_printf ("\nimage not
yet loaded \n ");
}
Else
{
        ulk_proc_clcd_display_string("\ negative
image conversion ");
 negative image();
}
Break;
Case 4:

 if(is loaded==0)
                  {
ulk_cpanel_printf ("\nimage not yet loaded \n ");
}
Else
{
        ulk_proc_clcd_display_string("\ binary
image conversion ");
 binary image();
}
Case 5:
          Tokeypadmode();
          Break;
Case 6:
         Return 0;
Default:
       ulk_cpanel_printf ("\ninvalid option\n");
     ulk_proc_clcd_display_string ("\ninvalid
option\n");
}
   }
Return 0;

}
```

Simulation Output

UTLP Output

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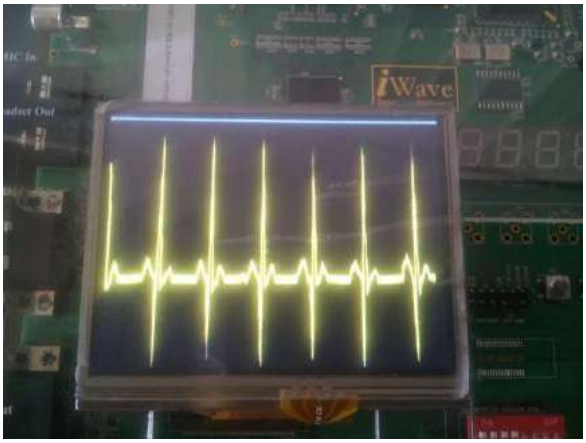
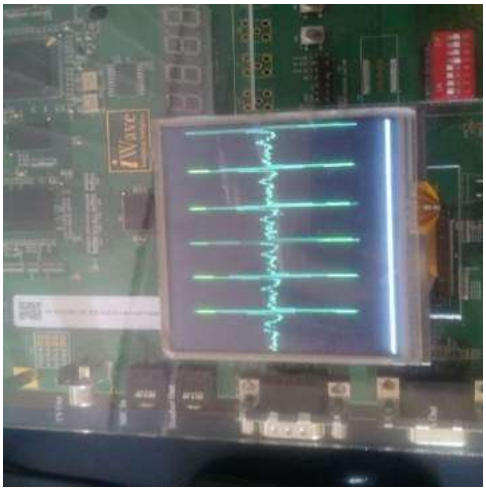
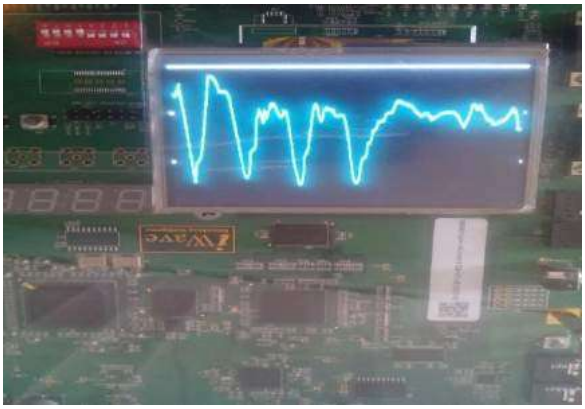


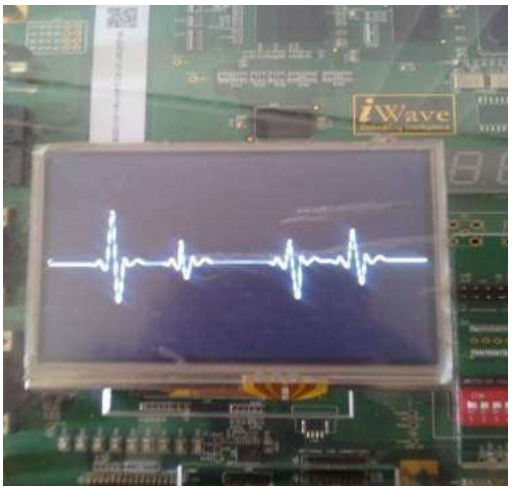
BP abnormal output



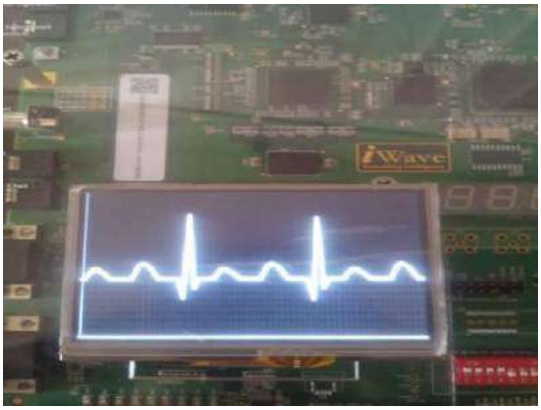
ECG abnormal output



BP normal output



Heart normal output



ECG normal output

Heart abnormal output

The above simulation outputs shows easy identification of abnormalities easily.

CONCLUSION

The implementation of this system will provide enhanced monitoring and quick responsibities taken. It will reduce human errors, time consumption and work. Further development of this system using telepresence concept will provide the possibility of monitoring patient from anywhere in the world and all hospitals details like blood donars, This will be very helpful and reduce search times during emergency situations.

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