Chapter 5

Results & Discussion

5.1 Important Results

The following are the important results for the research work

1. Analog card for the 12 lead ECG signal has been successfully developed. This card is having all the important features such as, low pass filter, high pass filter, notch filter, high voltage protection, level shifter, removal of base line wandering, instrumentation amplifier, etc.

2. The output of analog card is given to the input port of ARM processor LPC2103 which is having inbuilt 10 bit A-D converter.

3. This signal is analyzed using the software developed in higher level language (C++) to detect irregularity in the cardiovascular system. This is a fresh approach adopted to analyze ECG signal and detect arrhythmias. The following types of arrhythmia can be detected using the present system.

   A. Bradycardia
   B. Tachycardia
   C. Bigeminy
   D. Trigeminy
   E. Ventricular tachycardia

4. GUI has been developed using Visual Basic 6.0. which displays ECG signal for all 12 Leads and types of arrhythmia detected.

5. The output of the system i.e. the types of arrhythmias detected can be transmitted to the doctor using GSM module MAESTRO 100-LITE.
6. The data once recorded is stored and can be viewed as and when required.

7. The software has been tested using the signals available on www.phsionet.org/physiobank/database/html/mitdbir/records.htm#

5.2 Images of Cardiac waveform analysis system are shown below:

Graphical User Interface (Screen shot)

![New Patient Data Entry Screen](image)

Figure 5.1 New Patient Data Entry Screen
Screenshot showing window listing previous data of patients:

Figure 5.2: Previous Patient Records
Figure 5.3: View of 12 Lead ECG Output
Figure 5.4: ECG Output Detected with Bradycardia
Figure 5.5: ECG Output Detected with Tachycardia
Figure 5.6: ECG Output Transmitted Successfully