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Synopsis

An Electrocardiogram (ECG) is used to monitor the heart. The body surface is recorded with ECG signals, and is a weak bipolar low frequency signal. A normal ECG signal's frequency range is 0.05–100Hz. Several noises such as power line noises, patient –electrode motion artifacts, baseline wandering, electrode contact noises and chest muscles of the EMG signals. It can enhance prevention and early diagnosis capability; improve patient condition, mobility, and security by continuous monitoring of heart. The device should be wearable or implantable inside the body to allow continuous monitoring of the ECG signal. Therefore it needs to be small, and the fewest disturbances from surrounding interference and other human body signals are possible. It causes the moderns to have the problem of cardiovascular disease, due to poor diet and too much pressure. For some initial stage of chronic cardiovascular diseases, it feels palpitations, dizziness and other symptoms, making it are easy for moderns to overlook the onset of the symptoms and lose first treatment. Nonetheless, some problems may have happened when the device is smaller. There's power consumption and high reliability in detection. This introduces the Compressive Sensing Technique using Arduino Uno processor along With ECG Signals. Arduino is a platform which is open-source. Arduino is used for the electronic program and constructing. It can get information and sent it to most devices. The board is programming using hardware called Arduino Uno circuit board and software program. Heart Rate Variability (HRV) tends to monitor heart rate variations and can be an indicator of myocardial infarction, representing the physiological mechanisms of sympathetic nervous and parasympathetic control. The Arduino Uno is a microcontroller module, and it offers high-performance, it was a microcontroller based on AVR RISC. The device works from 1.8– 5.5 volt. Compressive sensing is a method for signal processing. In the compressive sensing technique, the sparse signal is used and reconstructed from incomplete measurements, and it contains inadequate volume of information. It can be done if the signal

Blurb

The concept of this book is ECG signals- Electrocardiography is connected with Arduino UNO- microcontroller. This book demonstrates how our heart waves can be connected to a microcontroller. What kind of obstruction or change occurs in the wave according to the different changes of the atmosphere can be known from this book. The ECG Signal plays an important role in the diagnosis of heart diseases and disorders. An ECG is a significant physiological signal for diagnosis of cardiac disease. Modern usage of monitoring devices with electrocardiogram is increasing. Huge storage space and large quantities of data are that, and ECG compression is required for efficient storage and it has been extracted from a medical database. An interesting research line focuses on transforming the original one-dimensional waveforms of the ECG into two-dimensional information, followed by a processing stage using image processing tools. Many cardiac abnormalities can be observed with the aid of an ECG interpretation including inadequate blood flow, heart muscle death due to coronary thrombosis and heart muscle enlargement. Arduino can be used to for the development of interactive objects, taking inputs to control outputs. It is connected to the Arduino hardware to communicate and upload sketches. Arduino can read information from input devices such as Trimmer(potentiometer), Antenna, Sensors, e.t.c, and can also send data to the output devices such as Speakers, LED, DC motor, LCD Screen, e.t.c. User communities are groups of people using a given product, the Arduino in this case. So, the design has been enhanced, and it helps drive the Arduino board for direction to future.

**Author
Bio**

Dr. Nisarg Chandrakant Joshi is Assistant Professor, Physics & Nodal Officer of Ratnamani Science & Commerce College, Becharaji, Mehsana, Gujarat. He has completed his under graduation in Electronics from Veer Narmad South Gujarat University, Surat in 2011, and his post graduation in Electronics & Communication from Sardar Patel University, V. V. Nagar in 2013. He has completed M.Phil in Electronics & Communication from UNS Institute of Engineering & Technology, in 2014. He has completed Ph.D in Electronics & Communication Engineering under guidance of Prof. Dr. C. Ram. Singla from Madhav University; Rajasthan. He has completed 03 FDP, 15 National and International seminars/ symposia/ conferences/ workshops and presented 8 research papers, of which 4 papers had been presented in international conference. He is Reviewer in Journal of Emerging Technology and Innovative Research. He has Life time membership in IPA- Indian Physics Association (SUR/LM/13239), IAENG- International Association Engineers & SDIWC- the Society of Digital Information and Wireless Communication. He has been coordinate IIRS, ISRO online programmes. His research area is Digital Electronics & Microcontroller. He is also a good speaker. He has also given expert lectures in a one-week national workshop and a 3-days camp, which was sponsored by university.

He has a very active and energetic dynamic personality.