PROBLEM STATEMENT DESCRIPTION

1. LESS INVASIVE LONG TERM BLADDER URINE PRESSURE MEASUREMENT SYSTEM

A mini-invasive system for long-term bladder urine pressure measurement system is presented. Not only is the design cost reduced, but also the reliability is enhanced by using a 1-atm cancelling sensing instrumentation amplifier (IA). Because the urine pressure inside the bladder does not vary drastically, both the sleeping and working modes are required in order to save the battery power for long-term observation. The IA amplifies the signal sensed by the pressure sensor, which is then fed into the following analog-to-digital converter. Owing to the intrinsic 1-atm pressure existing inside the bladder, the IA must be able to cancel such a pressure from the signal picked up by the pressure sensor to keep the required linearity and the resolution for pressure measurement of the bladder urine. The pressure range of the proposed system is found out to be 14.7~19.7 Psi, which covers the range of all of the known unusual bladder syndromes or complications.

2. MEASUREMENT OF INHALED / EXHALED RESPIRATORY SYSTEM

Monitoring respiration rate by measuring rate of exhale and inhale. Various techniques are there for monitoring respiration rate e.g. by counting how many times chest rises and falls in one minute using sensors, using microphone which is placed either close to the respiratory airways or over the throat to observe the variation of sound, using Photoplethysmography. Determine cost effective method for respiration rate measurement using NTC type Thermistor, amplifier circuit or Arduino (due) with result display on Arduino IDE. Measurement of respiration rate by measuring change in temperature from Thermistor which is placed in patients breathing mask.

3. INFANT PHOTOTHERAPY USING UV LIGHT

Phototherapy is the use of light for reducing the concentration of bilirubin in the body of infants. Although it has become a mainstay, a better understanding of the efficiency and safety of phototherapy applications seems to be necessary for improved clinical practices and outcomes. This problem statement was initiated to evaluate workers' exposure to Optical Radiation from different types of phototherapy devices in clinical use. During infant phototherapy the staff monitors babies periodically for around 10 min every hour. The solution of this should suggest that there is a great variability in the spectral emission of equipments investigated, depending on the types of lamps used and some phototherapy equipment exposes operators to blue light photochemical retinal hazard. The engineering design of phototherapy equipment can be optimized. Specific requirements for photobiological safety of lamps used in the phototherapy equipment should be defined in the safety product standard for such equipment.

4. POCKET HELD FETAL HEART MONITORING SYSTEM

The fetal heart rate is monitored primarily using a Pinard stethoscope, commonly referred to as a fetoscope. The fetoscope is difficult to use for lesser trained healthcare workers. The fetoscope often results in an inaccurate determination of the heart rate and unnecessary referrals in cases when the heart rate cannot be heard It is limited by its inability to record the fetal heart rate, difficulty of use when the fetal position is unclear, difficulty of use in the presence of background noise, and discomfort of use for the physician. Developed from this understanding of the problem, there needs to be a way for lesser-trained healthcare workers to quickly determine the fetal heart rate so cardiovascular abnormalities can be reliably identified. However, little diagnostic value is placed on a fetal heart rate recorded over a short period of time due to expected variations in the fetal heart rate. Listening to the fetal heart rate in an antenatal appointment has little value more than reassurance to the mother . Normal variability reflects a well-functioning cardiac and neurological system . Therefore, a fetal heart rate taken instantaneously without establishing a baseline and accounting for variations is clinically indeterminate. The need statement therefore has shifted to for lesser-trained healthcare workers in resource-limited settings to determine the baseline fetal heart rate and its variations so fetal distress and cardiovascular abnormalities can be quickly and reliably identified.

5. WIRELESS ECG:

A wireless electrocardiogram (ECG) is a reading of electrical signals in the heart taken with electrodes that transmit signals wirelessly to a base unit like a computer. Electrocardiography is a valuable tool for diagnosis and monitoring of patients; wireless systems provide more functionality and comfort for patients. With traditional equipment, the patient must wear leads attached to the electrodes, and things like movement can interrupt the test and interfere with readings. The problem statement is to develop a wireless ECG system which is more efficient than the existing design.

6. ULTRASONIC BASED PATH PLANNING FOR THE BLIND PERSON:

About 1% of the human population has visual impairments, and 10% of them are totally blind. One of the consequences of visual impairment is the limitations of mobility. Exploring a new environment is a huge challenge for the visually impaired. Hence there is a need for a system that is able to assist them safely during their journey. While normal people will rely on their vision to find the places, they have to rely on their other senses to find the place correctly. Due to this reliance, they frequently get lost, returning at the same place over and over again or found themselves at other places instead of their target place. Previously, to cope with this problem, they used traditional white cane or guide dog as a support. However, the advancement of technology enables new ways of navigating people with vision disability. To reduce this problem, develop a path planning for the blind people based on ultrasonic systems.

7. HEART BEAT RATE MONITORING SYSTEM-RF BASED WIRELESS HEART BEAT RATE MONITORING SYSTEM:

In the developing countries or rural hospitals, health care budgets are very limited and increasing expenditure is affected to the quality of service in a small hospital. Monitoring of heart rate is essential for real-time information that would allow emergency detection and for evaluating the risk of heart failure. However, commercial heart rate monitors are expensive and not every hospital can afford it. There are some researchers have demonstrating a low-cost heart rate monitor and adopting wireless technology into this kind of system using ZigBee, XBEE, Bluetooth . However, some of those designs still required high power, time consuming and big data overhead for communication protocol. Design a RF based wireless heart beat rate monitoring system which will be helpful to the entire Medical Environment.

8. EYEBALL SENSOR FOR AUTOMATIC WHEEL CHAIR MOVEMENT FOR PARALYZED PATIENTS:

A wheelchair is a chair with wheels, designed to be a replacement for walking. The device comes in variations where it is propelled by motors or by the seated occupant turning the rear wheels by hand. Often there are handles behind the seat for someone else to do the pushing. Wheelchairs are used by people for whom walking is difficult or impossible due to illness (physiological or physical), injury, or disability. People with both sitting and walking disability often need to use a wheel bench. Eyes are the most important features of the human face. Eyeball sensors are used in different spectrums of different occupations. Design an automatic wheel chair for paralyzed patients based on Eyeball Sensor.

9. SECURE MEDICAL TAGS FOR REDUCING ERROR AND DRUG INTERACTION WITH EHR SYSTEM.

The main moto is to propose the use of medical tags decreasing therapeutic blunders, and Secure Health card for putting away Electronic Health Record (EHR) in light of Secure NFC Tags, by using Card Emulation Mode or NFC P2P Mode or. Students can present an advanced mobile phone application intended to help patients maintaining a strategic distance from these errors. Secure Healthcare administrations is a need for creating countries, where the cost of human administrations is high and security and insurance are essential issues and making countries like India, where there is a mass populace to manage in facilities and healthy human administrations strategies are required. A capable, trustworthy, generous and secure prosperity stream is imperative to supervise patients, their prosperity records effectively and for the right care to reach to the patient at the perfect time.

10. LEG MOTION TRACKING.

A vision-based system for tracking and interpreting leg motion in image sequences using a single camera for a user to control his movement in the virtual world by his legs. The proposed system can also be implemented on a commercial PC without any special hardware.

11. AUTOMATIC ACCIDENT DETECTION AND AMBULANCE RESCUE SYSTEM.

Nowadays the road accidents in modern urban areas are increased to uncertain level. The loss of human life due to accident is to be avoided. Traffic congestion is a major fact that causes delay to ambulance. The idea behind this is to implement a system which would control mechanically the traffic lights in the path of the ambulance. Students can build a controller that identifies the location of the accident spot through the sensor systems in the vehicle which determined the accident and thus the controller walks through the ambulance to the spot.

12. DEVELOPMENT OF WHEELCHAIR CUM STRETCHER.

The problems which are generated at the timing of patient transferring from bed to wheel chair can be eliminated by developing new design of stretcher cum wheelchair i.e. providing the wheelchair cum stretcher with a detachable stretcher which can operated easily as well as used as a trolley when needed.