WEARABLE SENSORS

- Wireless miniature sensors
- Allow monitoring of physiological signals.
- Used for diagnosis and treatment of diseases.
- Recorded data can be processed to detect patient’s clinical situation
- Two types:
  1. RING SENSOR
  2. SMART SHIRT
RING SENSOR

- Monitor heart rate and oxygen saturation
- Equipped with low power transceiver
- Accomplishes bi-directional communication with a base station
WORKING PRINCIPLE

- Blood volume in the finger changes with the heart muscle expansion and contraction.
- This blood volume changes can be easily detected by photoelectric methods.
- Light emitted from LED is passed through finger and is directed to Photoresistor.
- Optical density of blood depends on the blood volume.
- If the blood volume increases, optical density increases, light transmission through finger reduces & the resistance of photo resistor increases.
- Thus the voltage generated by photo resistor varies with the amount of blood in the finger.
WORKING OF RING SENSOR

- LEDs & PD are placed on the flanks of finger.
- Reflective type or transmittal type
- PD-A captures main signals (Truce pulsate signal + noise)
- Noise reference is obtained by PD-B.

![Diagram](Fig.1.Noise Cancellation Mechanism)
BLOCK DIAGRAM OF RING SENSOR

1. Power Source
2. Light Source → LED Modulation
3. Photo Detector
4. Filtering → RF Transmitter
5. Cellular Phone
6. Bi-directional RF Communication
7. Message to the Carrier
8. Internet

DATA ACQUISITION
APPLICATIONS

- **Catastrophic Detection:**
  - wireless supervision of people during hazardous operations.
- **Chronic medical condition:**
  - monitoring the hypertension in cardiovascular disease
  - chronic surveillance of abnormal heart failure
ADVANTAGES AND DISADVANTAGES

➢ ADVANTAGES:
  - Continuous monitoring
  - Right Treatment at the right time at right cost
  - Easy to wear and takeoff.
  - Reducing the health care cost

➢ DISADVANTAGES:
  - Initial cost is high
  - Battery life is less
CONCLUSION

➢ The ring sensor and smart shirt are an effective, comfortable, and mobile information infrastructure that takes the advantage of telemedicine and information processing.

➢ It is expected that the smart shirt leads to the realization of “Affordable Healthcare, Any place, Anytime, Anyone”.

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