Video Monitoring of Patient Vital Signs

Raja Bala
Principal Imaging Scientist
Xerox Research Center Webster
Introduction

• Vital signs are important indicators of a patient’s health
  ➢ Pulse / heart rate
  ➢ Respiration rate
  ➢ Temperature
  ➢ Pulmonary volume

• Standard procedures place instruments in contact with the body
  ➢ Sphygmomanometer
  ➢ Stethoscope
  ➢ Thermometer
  ➢ Etc.

• Not desirable for infants and children

• Not amenable for continuous monitoring
Goal of our Research

• Continuous monitoring of vitals using non-contact, video-based solution

• Primary application: monitoring of premature infants in real hospital environments

• Advantages of our approach
  ➢ More comfortable for patient
  ➢ Reduces chance of infection
  ➢ Can work in difficult uncooperative environments
The Hospital Environment
**An Integrated Application**

*Activity Status:* 9:01 am
- Awake
- Feeding tube

- Respiration Rate: 40/min
- Pulse Rate: 140/min
- Temperature: 36.5°C

Xerox video processing technology
Monitoring Heart Rate

Subject 24

Region of Interest

Signal extracted

Pulse (bpm)

Ground Truth
Camera

time (secs)
Monitoring Respiration & Temperature

Thermal video from Neonatal ICU Kasturba Hospital (Manipal University)
Monitoring Pulmonary Volume

VISIBLE/INFRARED IMAGING SYSTEM

Pulmonary volume