



Prospects for the Design of an E-health System for Monitoring Patients with Diabetes and Stroke

M. Ivanovici, P. Borza, L. Nedelcu, H. Decean, C. Falup, M. Romanca, I. Szekely



Context

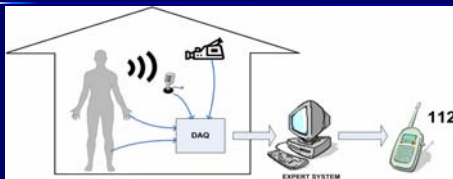
- The population of Romania
 - Aged population with high risk of disease and reduced birth rate
 - Cardiovascular diseases – 70%
 - 25% stroke
 - Endocrine, nutrition and metabolic – 1%
 - 95% diabetes

WSEAS MeLS'09

Laurentiu Nedelcu

2

System Architecture



- Data acquisition followed by transmission to a software application (expert system) for automatic interpretation and emergency call

WSEAS MeLS'09

Laurentiu Nedelcu

3

System Features

- Non-invasive, fast and safe analysis, high comfort for the patient
- Records bio-signals – glycemia, pulse and blood oxygen concentration, temperature, movement etc.
- Uses the HL7 (Health Level 7) standard for communication

WSEAS MeLS'09

Laurentiu Nedelcu

4

Implementation

- Portable digital glycemia analyzer DEXCOM 7+
- Portable digital pulse oximeter Mindray PM-50
- Thermal imaging camera (IR images)
- Video camera for action recognition

WSEAS MeLS'09

Laurentiu Nedelcu

5

Portable Digital Glycemia Analyzer DEXCOM 7+



- Smallest water-resistant available sensor
- Most flexible, maximum of comfort for the patient due to a wireless receptor
- Longest period of utilization (7 days)

WSEAS MeLS'09

Laurentiu Nedelcu

6

Portable Digital Pulse Oximeter Mindray PM-50



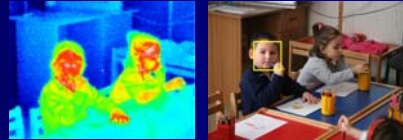
- Portable and easy to use
- Very long operational time (stand-by mode)
- The recorded data can be sent to a PC for automatic interpretation

WSEAS MLIS'09

Laurentiu Nedelcu

7

IR Images



- The data regarding the temperature from the IR images can be correlated with the information from the visible spectrum

WSEAS MLIS'09

Laurentiu Nedelcu

8

Action Recognition



- Video and Time-of-Flight cameras for tracking patients' movements
 - by recording and interpreting key-points' trajectories (head, hands, legs etc.)

WSEAS MLIS'09

Laurentiu Nedelcu

9

Conclusions

- The proposed e-health system
 - Both architecture and implementation
 - Used to monitor the health status of a patient
- Automatic acquisition, transmission, analysis and emergency call
- Useful tool for primary medical care

WSEAS MLIS'09

Laurentiu Nedelcu

10