An Evolutionary Prototyping for Smart Home Inahbitants Wearable Biomonitoring

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Outline

- Technological Challenges & Context
- Agent-based Problem Interpretation
- General System Analysis
- HFA Biomonitoring Device Prototyping
- Work in Progress
- Discussion

TECHNOLOGICAL CHALLENGES

2000

Web 1.0

Web 2.0

Web 5.0

Web 4.0

2050

Web 3.0

syssec

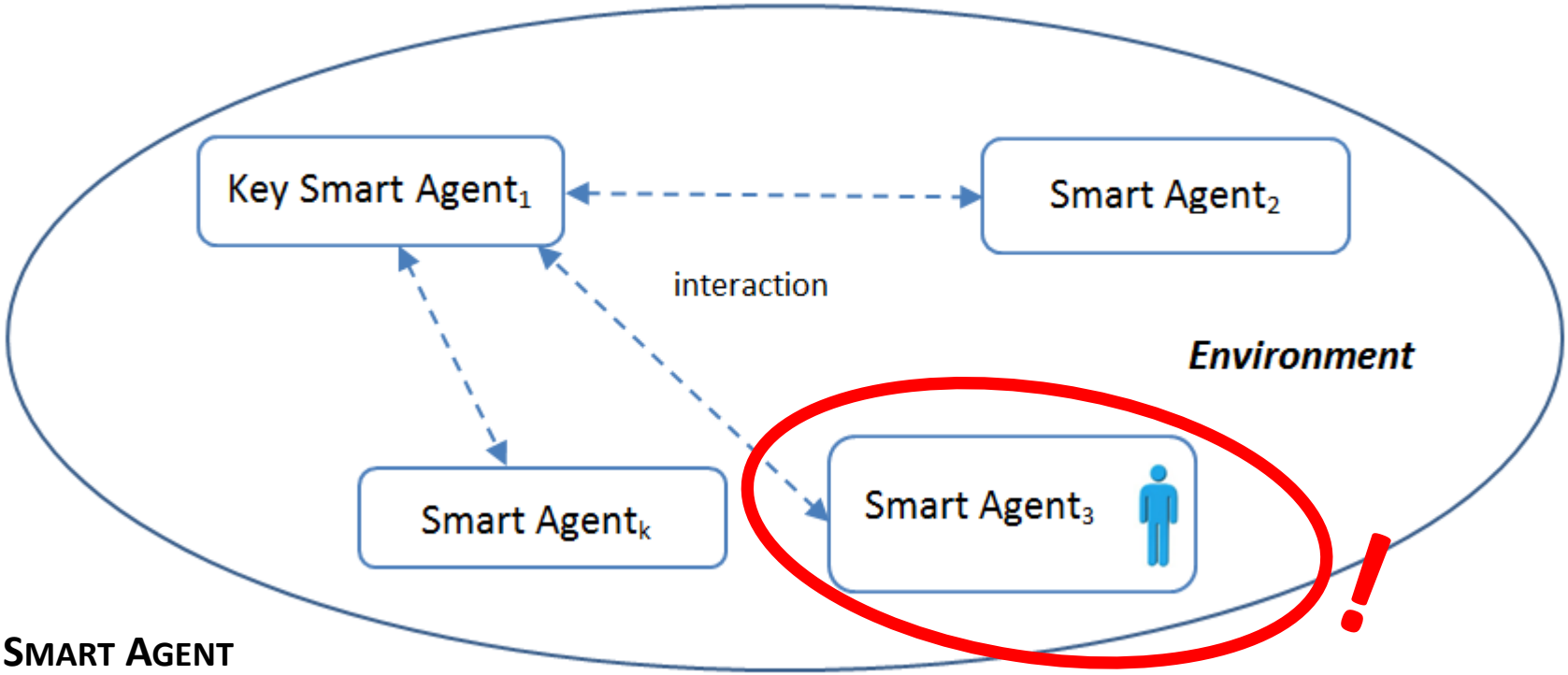
The Studied Context

THE HUMAN FACTOR

?

SMART HOMES

AGENT-BASED PROBLEM INTERPRETATION



SMART AGENT

{

Properties: property$_1$, …, property$_m$;

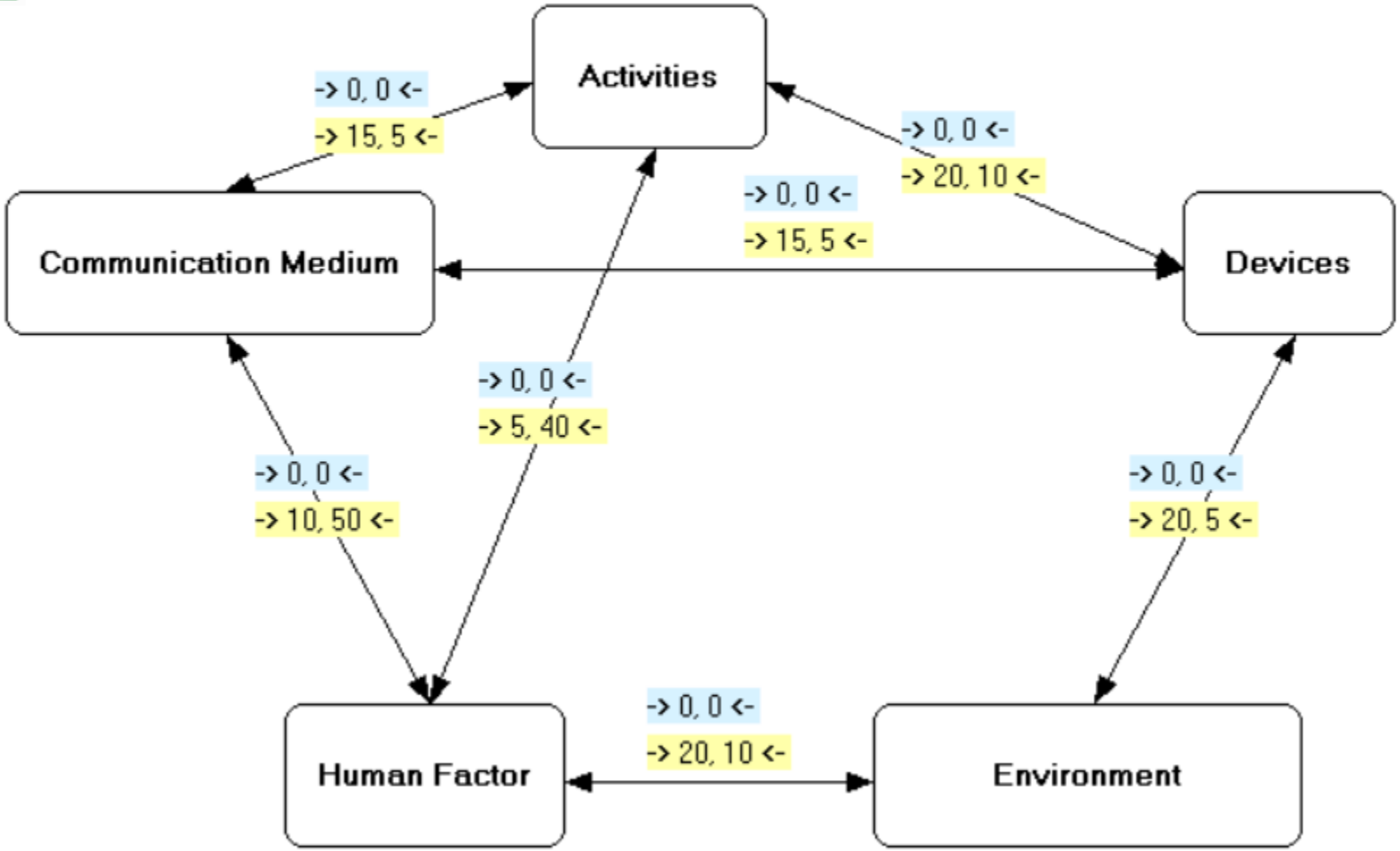
Activities: activity$_1$, …, activity$_p$

}

Boyanov & Minchev, 2013

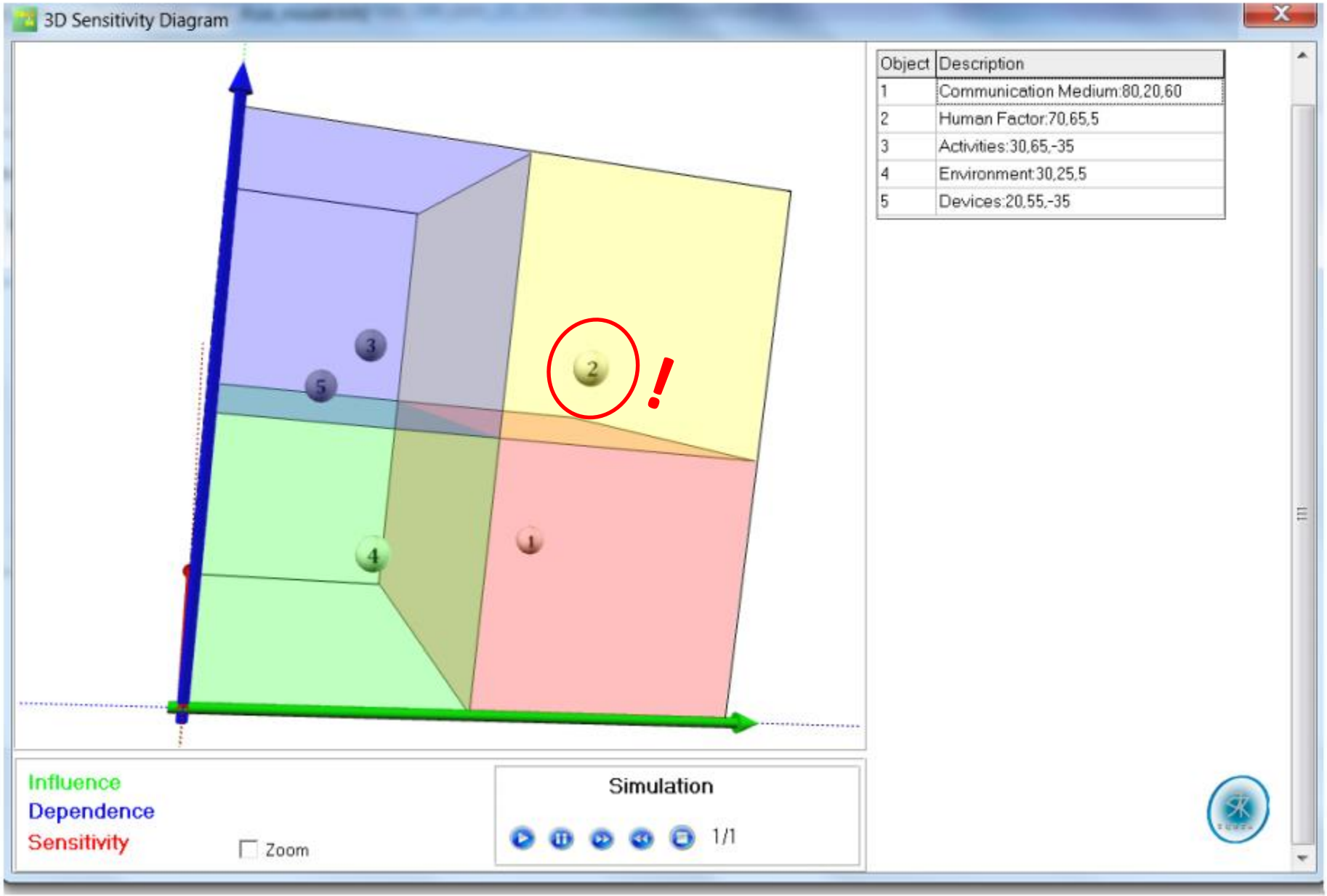
General System Analysis

I-SCIP-SA



Boyanov & Minchev, 2013

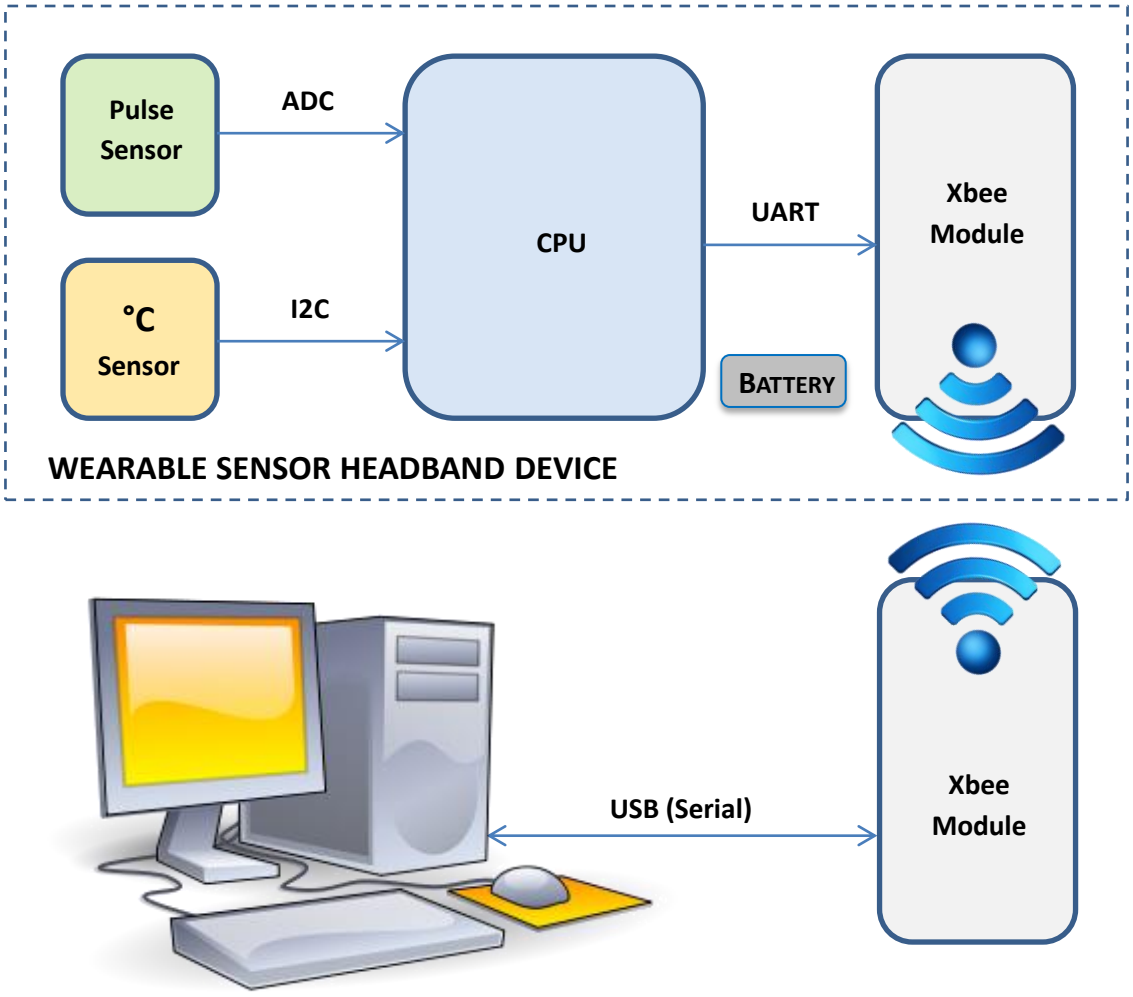
Resulting Classification



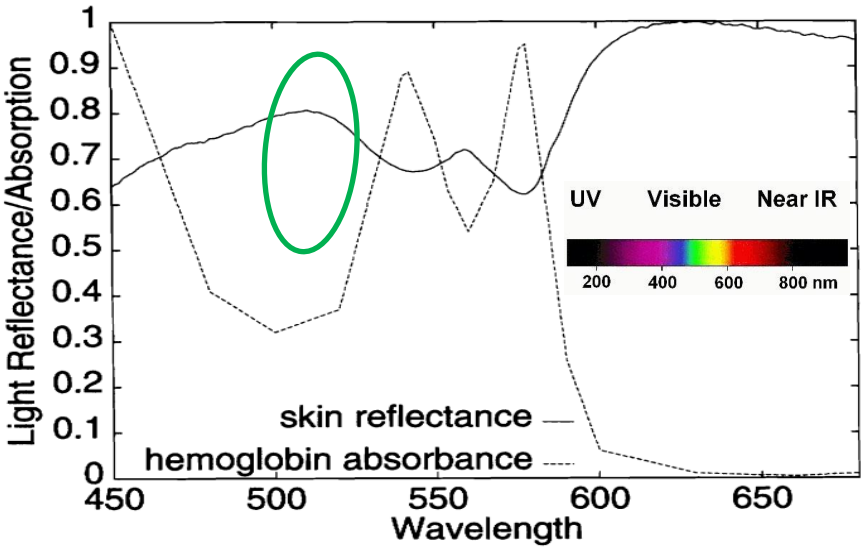
HFA Biomonitoring Device Prototyping

ViSensi Innovation

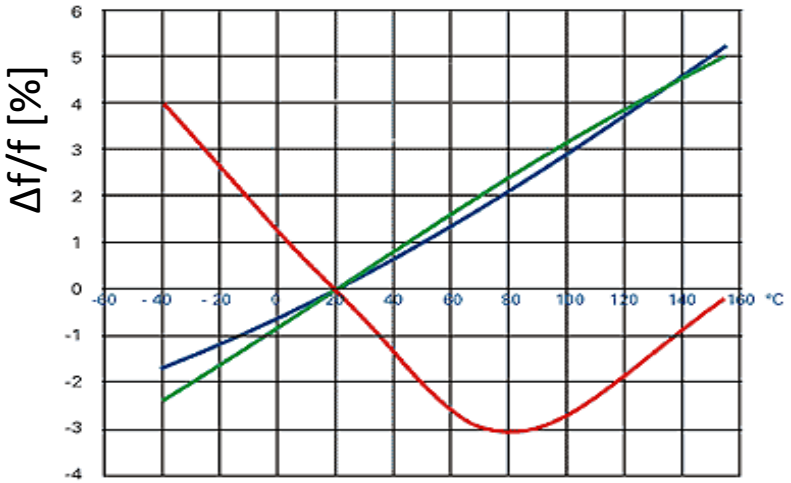
Pulse Wave & Body Temperature Wearable Sensor Headband Device with XBee Wireless PC Communication



Implemented Sensors

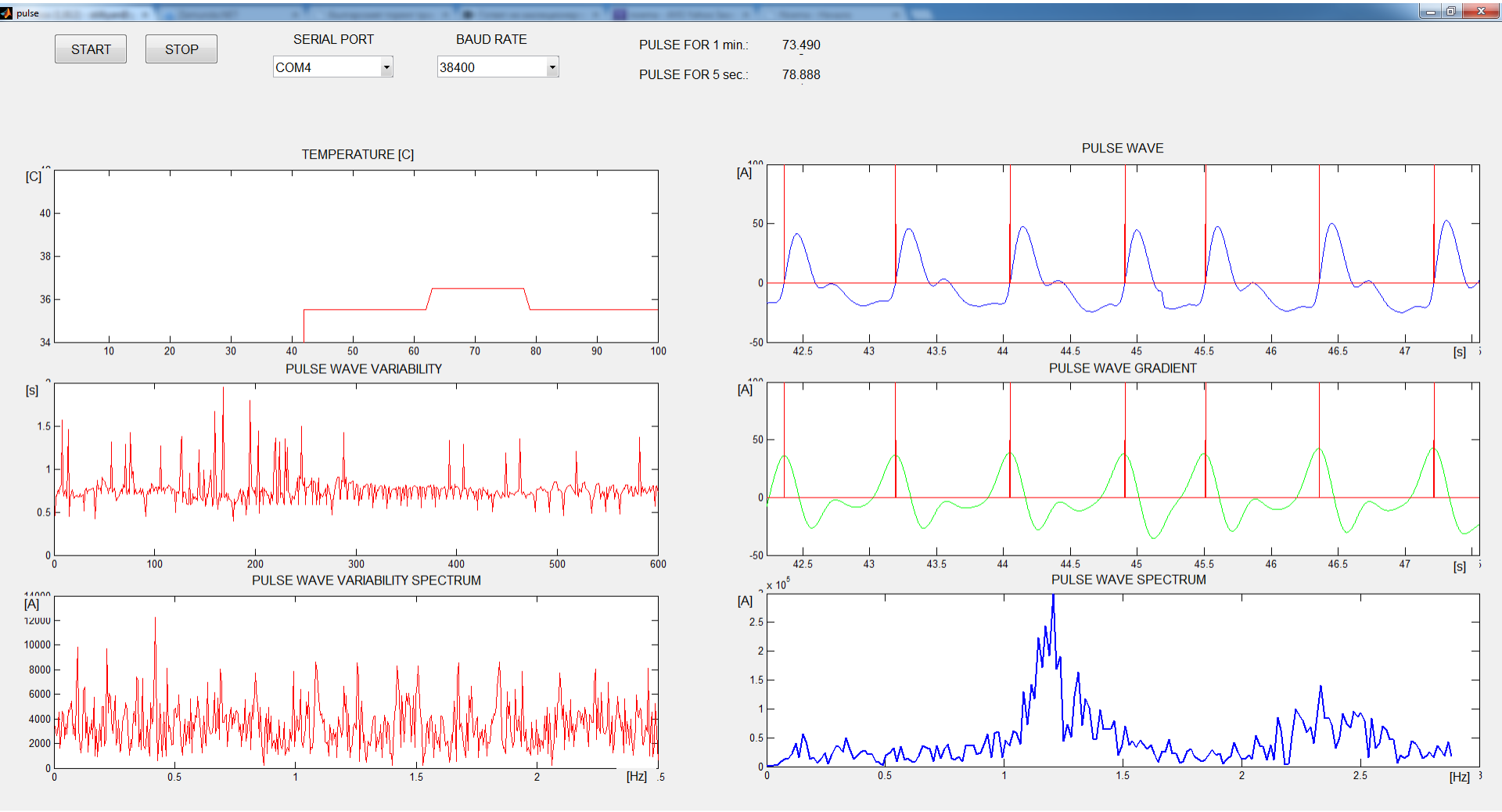


Skin reflectance vs. hemoglobin absorption



Temperature dependence of resonant frequency for the longitudinal oscillation for piezoceramic materials

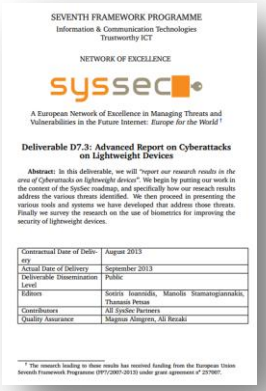
SOFTWARE FOR DATA ACQUISITION AND ANALYSIS



Work in Progress

Biosensors → ADC → DSP Processing & Feature Extraction → User Avatars

Lightweight device → User working space



SEVENTH FRAMEWORK PROGRAMME
Information & Communication Technologies
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NETWORK OF EXCELLENCE

syssec

A European Network of Excellence in Managing Threats and Vulnerabilities in the Future Internet: *Europe for the World* [1]

Deliverable D7.3: Advanced Report on Cyberattacks on Lightweight Devices

Abstract: In this deliverable, we will "*report our research results in the area of Cyberattacks on lightweight devices*". We begin by putting our work in the context of the SysSec roadmap, and specifically how our research results address the various threats identified. We then proceed in presenting the various tools and systems we have developed that address those threats. Finally we survey the research on the use of biometrics for improving the security of lightweight devices.

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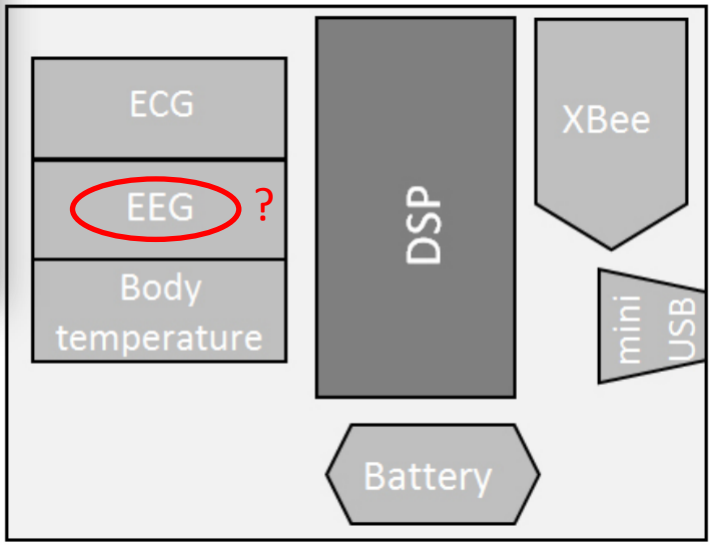

Discussion

Evidently the nowadays cyberworld with its fast progressing Web 3.0 and the upcoming Web 4.0/Web 5.0 human-machine interaction requires special attention to both technologies and human factor.

So, today as most important components of the digital world could be considered: the environment of living, i.e. smart homes and environment of communication: web based social networks & smart devices.

As a key player in this world the human factor still requires special attention and monitoring with suitable equipment for the behaviour & emotions dynamic changes.

One of the possible solution for this is the wearable wireless equipment that together with technologies observation could validate and provoke understanding of present and future cyberthreats.

Acknowledgements

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This study was also technologically supported by: "A Study on IT Threats and Users' Behaviour Dynamics in Online Social Networks", DMU03/22, Bulgarian Science Fund, Young Scientists Grant, 2011-2013, www.snfactor.com.

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Thank you for the attention!

Questions?