



*This project  
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# SMART I



## ADVISORY RESCUE SYSTEM

SPS - NATO - Slovenia – the former Yugoslav Republic of Macedonia\*

Project ISEG.EAP.SFPP 984753

Project duration: 08.04.2015 – 08.04.2018

*\*Turkey recognises the Republic of Macedonia with its constitutional name.*

# WHO WE ARE...

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# WHO WE ARE

## ○ Co-directors

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# INTRODUCTION

## ○ Battlefield

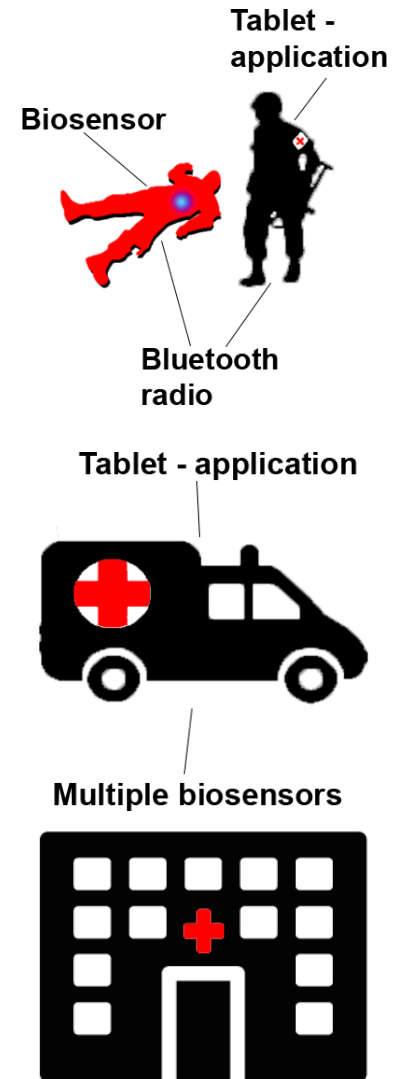
- SIARS is a Telemedical Information Smart System that uses biosensors, implements an automatic triage for the injured soldiers and transfer their vital parameters to the hospital. First Aid Responder gives medical treatment and prepare the heavy injured soldier for transportation according to the readings from the soldier's biosensor.

## ○ Transport (Role 1)

- Multiple biosensors are attached on the injured soldier in order to get more precise clinical picture of the soldier while transporting to the hospital.

## ○ Hospital (Role 2)

- According the previous measurements, the doctor in the hospital will get the full patient bio data history from the moment of injury.



# BIOSENSORS AND RADIO

- Zephyr BioHarness 3
- Omnisense - Blood pressure
- Nonin - Oxygen saturation
- Tait TP9400 radio



## ZEPHYR BIOHARNESS 3

- For extracting ECG, heart rate and respiratory rate, we use the Zephyr Bioharness sensor. The data are streamed at a frequency of 250 Hz.



# OMNISENSE - BLOOD PRESSURE

- For measuring blood pressure, we use the automatic MyTech Wrist Cuff Blood Pressure Monitor sensor, which communicates with Zephyr Bioharness bio module by its MAC address.



# NONIN - OXYGEN SATURATION

- For measuring SPO2, we use Nonin Saturated Blood Oxygen device, which also communicates with Zephyr Bioharness bio module by its MAC address.

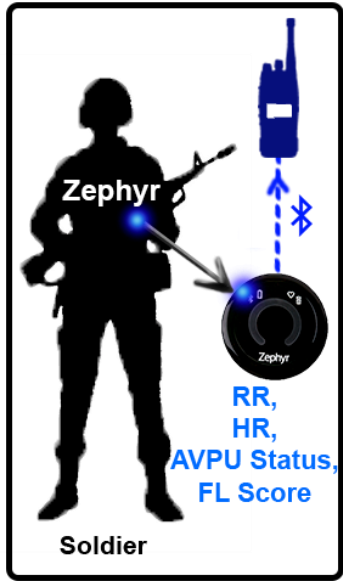




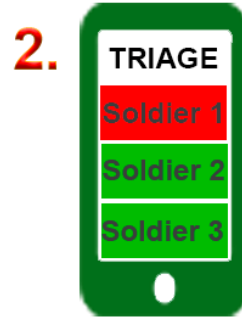
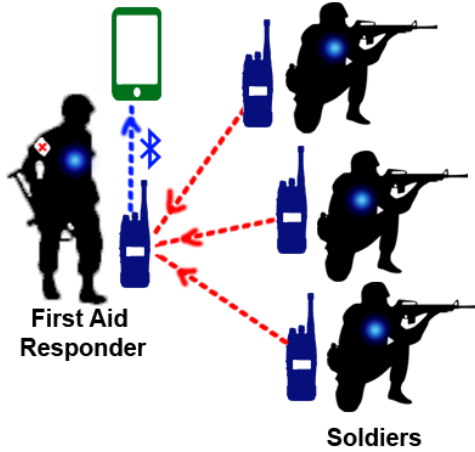
## TAIT TP9400 RADIO

- For the communication between the biosensors and the FAR's tablet is used Tait TP9400 radio.
- The biosensors send soldiers' biodata via Bluetooth to his radio, and the radio transfers the data via the FAR's radio to his tablet, where the application gives the triage information according that biodata. With that information the FAR can decide easily which soldier to treat first.

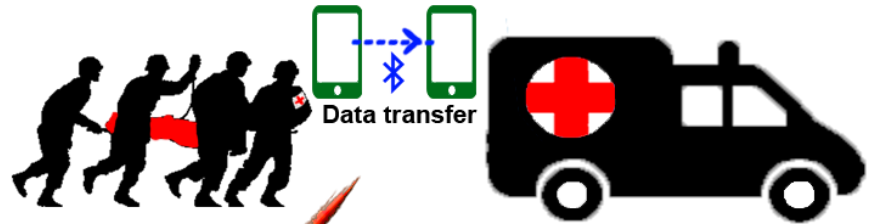




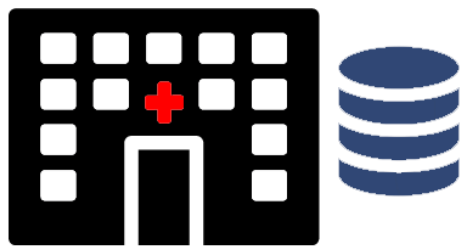
## 1. Battlefield



## 4. Transport (Role 1)

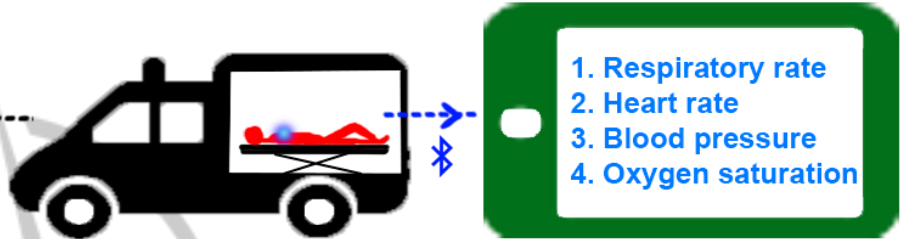


## 6. Hospital (Role 2)

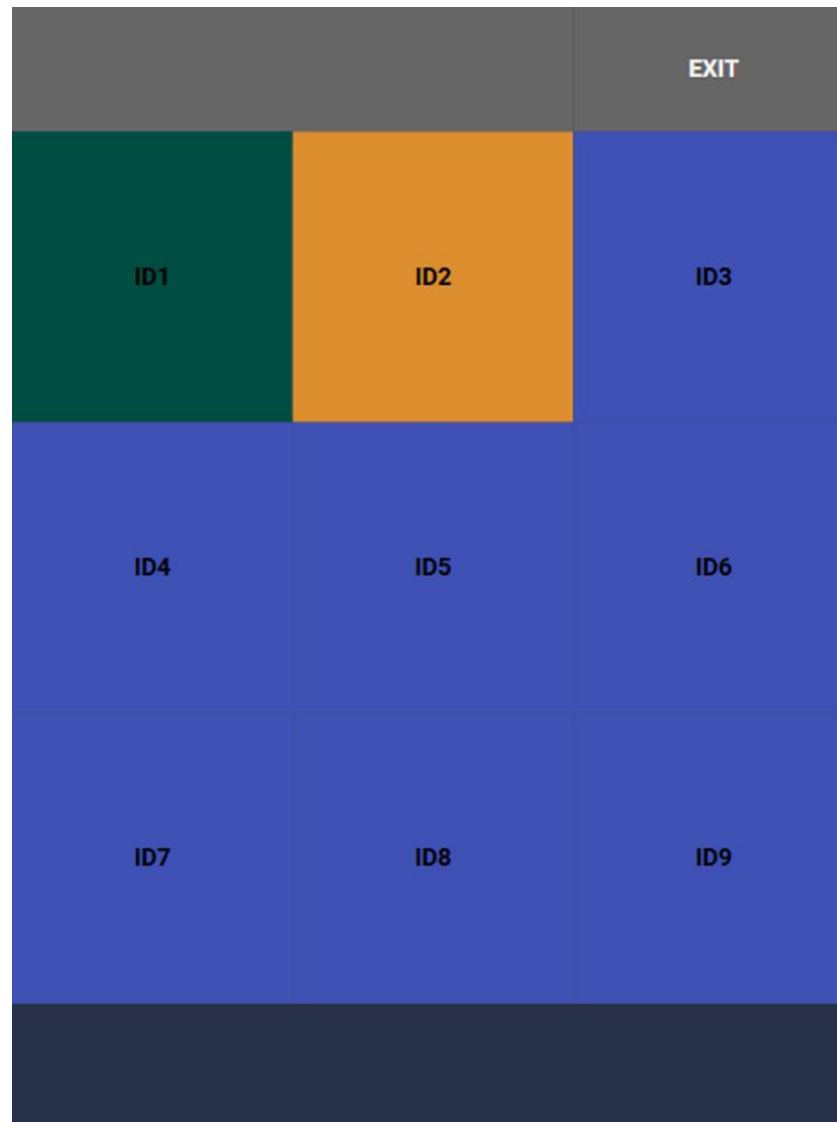


Transferring soldier's bio data to the server

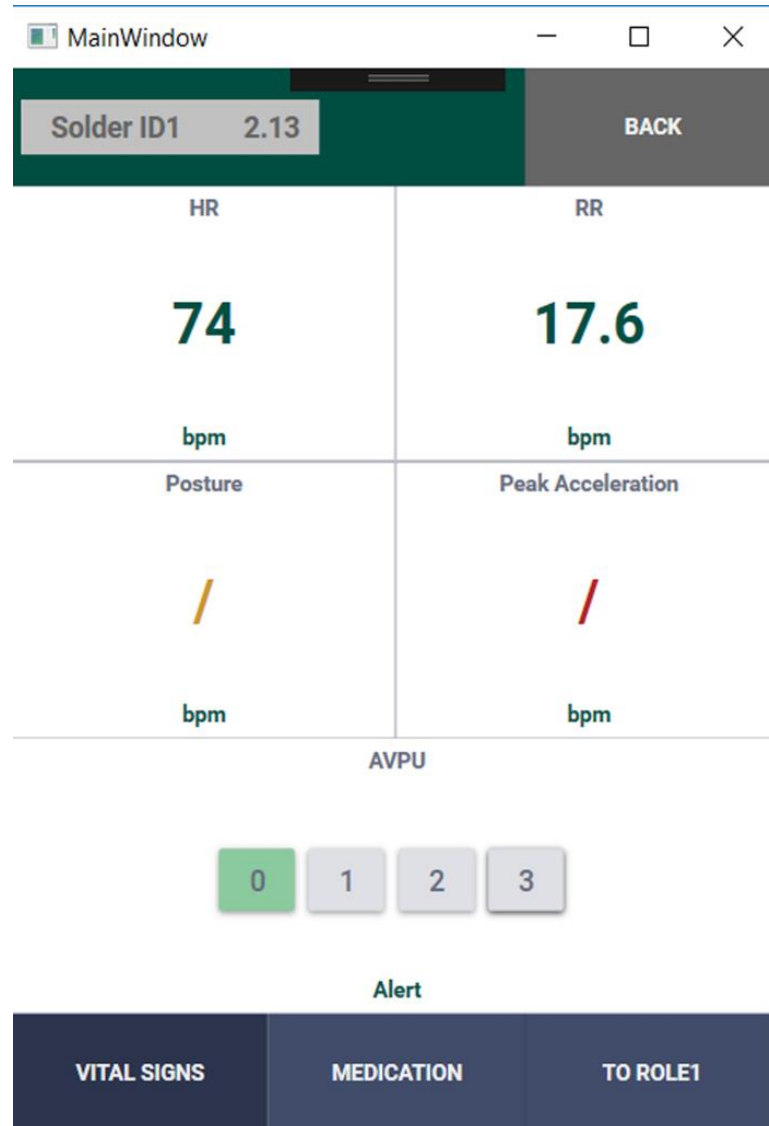
## 5. Transportation



# MOBILE APPLICATION FOR FAR (1)



# MOBILE APPLICATION FOR FAR (2)



# MOBILE APPLICATION FOR FAR (3)

MainWindow

Solder ID1 4.13

BACK

FAR protocol:

- Medication one
- Medication two
- Medication three
- Medication four
- Medication five
- Medication six

SAVE

VITAL SIGNS

MEDICATION

TO ROLE1



# MOBILE APPLICATION FOR FAR (4)

MainWindow

**Port Settings**

Port Number	COM8
Baudrate	19200
Parity	None
Stop Bits	One
Data Bits	8

**Web Service Settings**

Address	<a href="http://192.168.0.2:8094/api/vita">http://192.168.0.2:8094/api/vita</a>
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**Radio ID's For Soldiers**

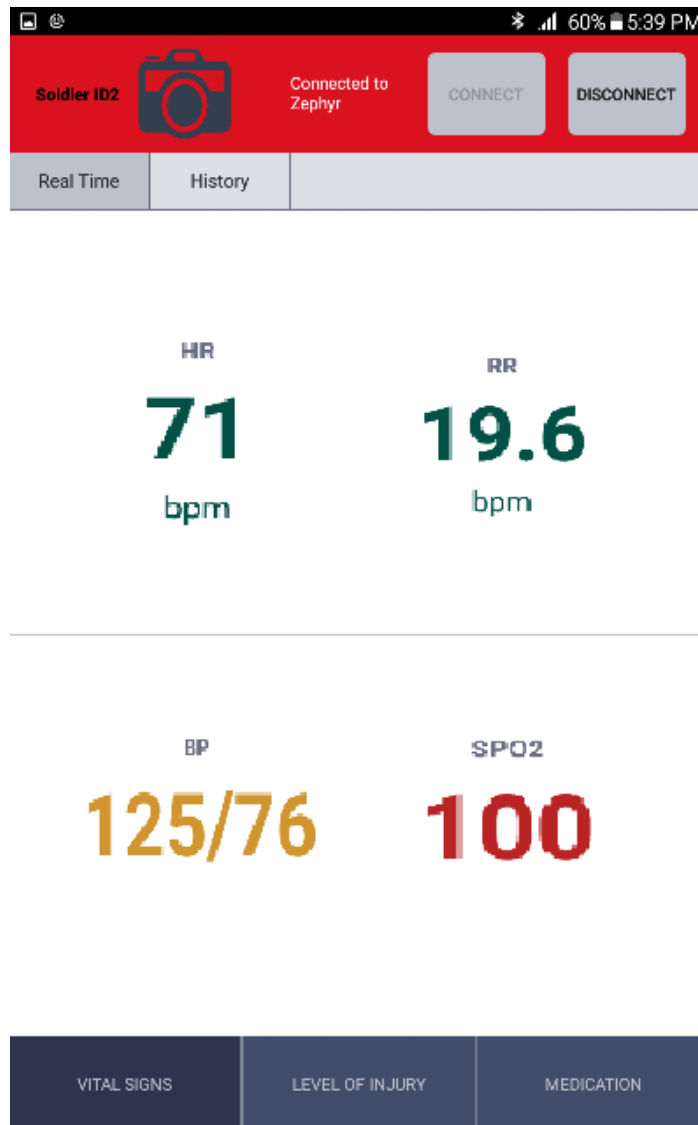
SoldierID1	85441
SoldierID2	85442
SoldierID3	
SoldierID4	
SoldierID5	
SoldierID6	
SoldierID7	
SoldierID8	
SoldierID9	

**SAVE SETTINGS**

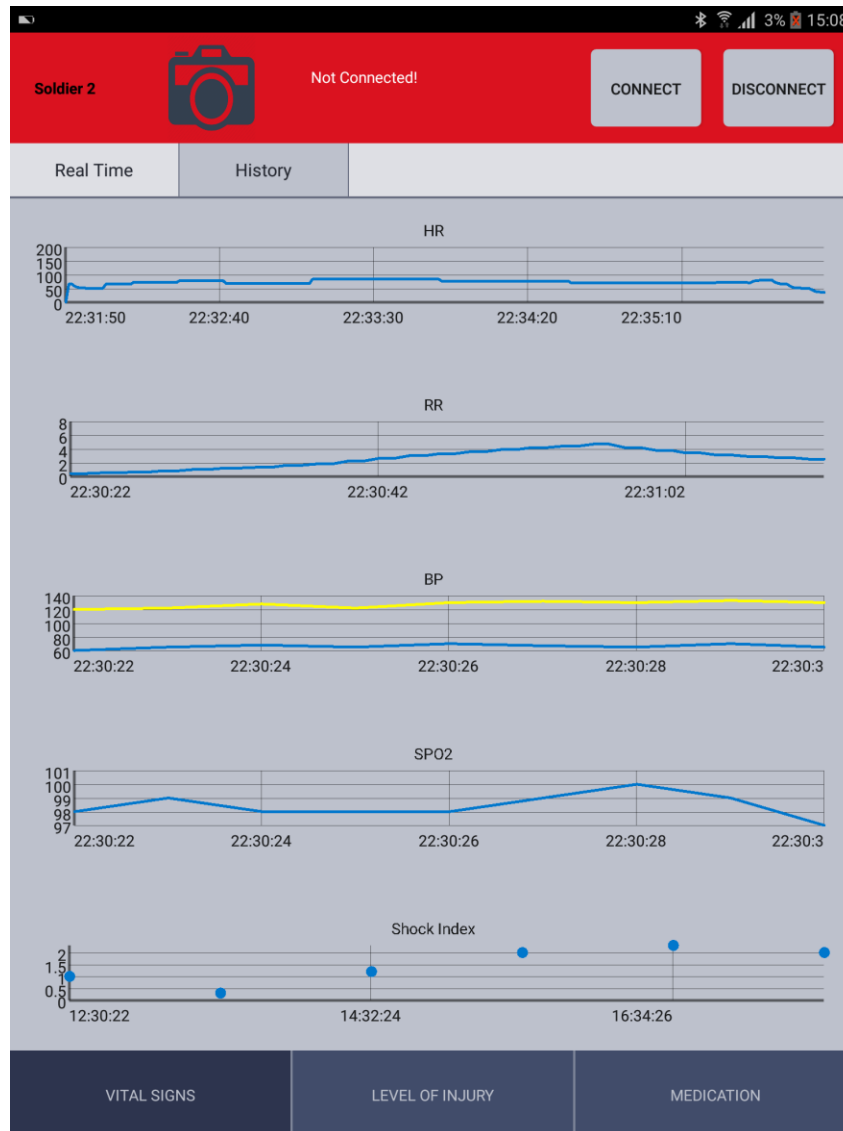
**CONNECT**



# MOBILE APPLICATION FOR ROLE 1 (TRANSPORT) (1)

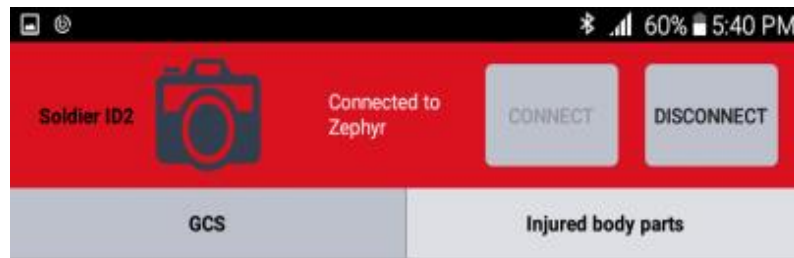


# MOBILE APPLICATION FOR ROLE 1 (TRANSPORT) (2)





# MOBILE APPLICATION FOR ROLE 1 (TRANSPORT) (3)



Eye opening:

- Spontaneous
- To voice
- To pain
- No response

Verbal response:

- Oriented
- Confused
- Inappropriate
- Incomprehensible
- No response

Motor response:

- Obeys commands
- Localises
- Pain Withdraws
- Pain flexes
- Pain extends
- No response

Level of priority (according calculations): 13

SAVE

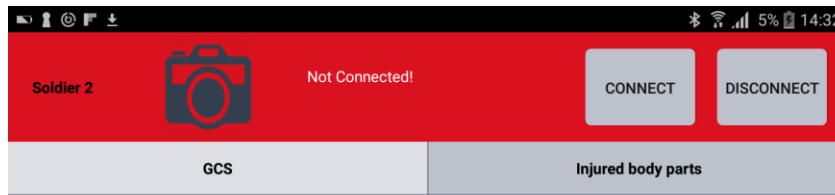
VITAL SIGNS

LEVEL OF INJURY

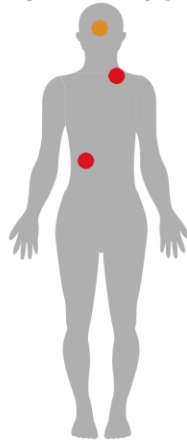
MEDICATION



# MOBILE APPLICATION FOR ROLE 1 (TRANSPORT) (4)



Mark the injured body parts:



Mark the level of injury:

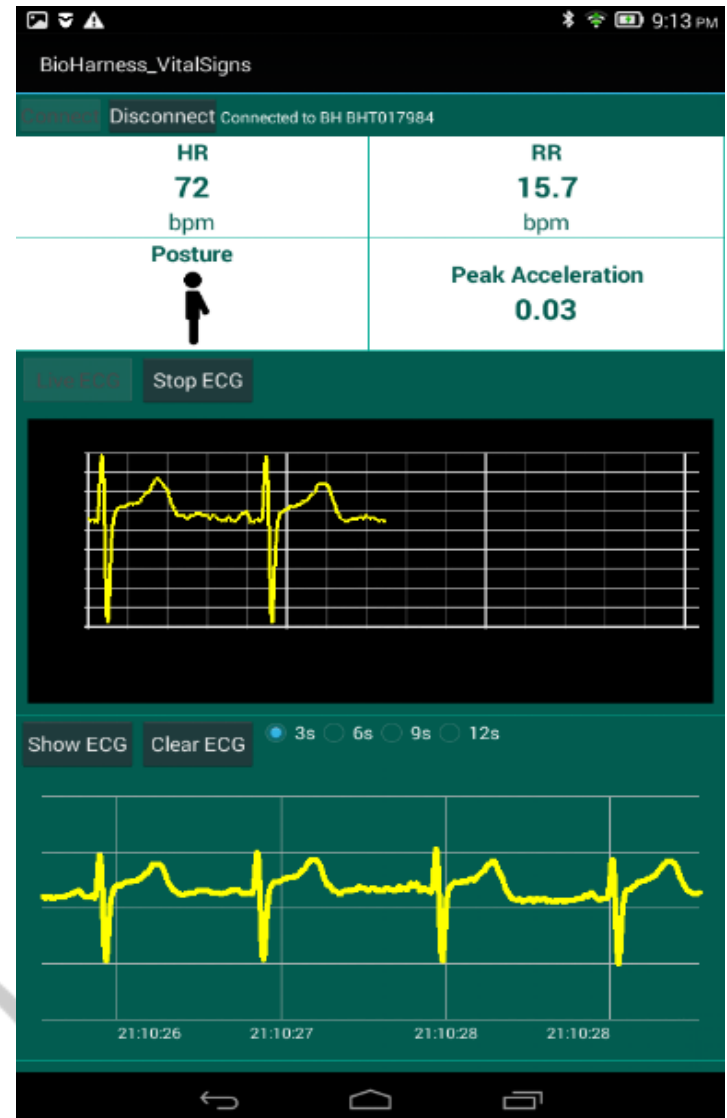
- IMMEDIATE CARE
- DELAYED CARE
- MINOR/NO CARE

CLEAR SAVE



# MOBILE APPLICATION FOR GENERAL HOSPITAL IN CELJE

- This application confirms the usefulness of the Zephyr Bioharness sensor in a hospital environment by providing remote monitoring of patient vital parameters. The application is set and tested in General Hospital in Celje, Slovenia.



# BENEFITS

- Effective transformation of management in medicine which will be implemented using the Telemedical System;
- SIARS will reduce the time of manually collection of vital parameters of injured individual;
- Automatic TRIAGE process;
- Processing of information to the higher levels of medical care.



## MORE INFORMATION

- [www.siards.finki.ukim.mk](http://www.siards.finki.ukim.mk)
- [www.ma.edu.mk/?page\\_id=1555&lang=en](http://www.ma.edu.mk/?page_id=1555&lang=en)
- Video MA: <http://goo.gl/xU7KqQ>
- Video UKIM: <http://goo.gl/Xt235x>
- [www.facebook.com/SiardsNato](http://www.facebook.com/SiardsNato)
- [www.twitter.com/SiardsNato](http://www.twitter.com/SiardsNato)

