SHORT TERM SCIENTIFIC MISSION (STSM) SCIENTIFIC REPORT

This report is submitted for approval by the STSM applicant to the STSM coordinator

Action number: CA16226

STSM title: Indoor living space improvement: Smart Habitat for the Elderly

STSM start and end date: 12/07/2021 to 26/07/2021

Grantee name: ………………. Here is my name ?…………………………………

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| **PURPOSE OF THE STSM:** |
| (max.200 words)  The proposed STSM aims to develop algorithms able to process and elaborate physiological measurements collected from subjects by the use of wrist-worn devices, within their workplace environment. It is in fact well-known that the stimuli originating from the surrounding environment may have a different impact on different subjects, with strong inter- and intra-subject variability. This study aims to look for quantitative footprints of different reactions generated on a subject by analyzing their Galvanic Skin Response measurement data when exposed to acoustic stimuli. In particular, it is of interest to investigate the spectral properties of the GSR signal, and how they change in response to the stimuli provided. The results of the STSM are expected to contribute to the activities of the subgroup WG4.3 on ICT solutions for ageing well in the workplace, as it will identify objective metrics or features to look for when sensing the subject’s status by means of wearable devices. |

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| **DESCRIPTION OF WORK CARRIED OUT DURING THE STSMS** |
| (max.500 words)  During my research visit, I helped collect Galvanic Skin Response (GSR) data, also named ElectroDermal Activity (EDA) from different people, reacting to different sound stimuli.  The following tasks was performed in the proposed STSM:  T1: State-of-the-art research in the scientific and technical literature about the known spectral properties and behavior of the GSR signal with respect to different stimuli, with a focus on acoustic stimulation.  T2: Assistance in data collection, in tests performed with some volunteers to be monitored through the sensor (EDA) during rest and sound stimulation.  T3: Implement proper software (Matlab) to process the data and extract features quantifying the effects of acoustic stimulation on the subjects’ GSR signals.  To process the data and extract features quantifying the effects of acoustic stimulation on the subjects’ GSR signals, the matlab was used to separate the data according to the type of sound stimulus received and in relation to the person's resting state, as the matlab code below describes:    I analyzed information previously obtained, through its optimization and extraction to excel documents, respectively organized, as well as graphically in matlab in order to detect a variation of Galvanic Skin Response values ​​in each of the different sound stimuli applied to each person, and if possible detect a pattern of behavior of values, in an overview. |

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| **DESCRIPTION OF THE MAIN RESULTS OBTAINED** |
| This chapter describes the results obtained during the STSM and also presents respective figures for a better demonstration.  With the separation of data into parts to differentiate what is stimulated or not, I used the code shown above and the results are in the following figure.    And with the help of Ledalab, a tool for the matlab that enabled the optimization of the data and its graphic representation, respectively (tau1 and tau2) .          *With all this processing and data extraction, it was possible to easily observe that most people suffered changes in their Galvanic Skin Response values ​​when they were under the effect of a sound stimulus, and depending on the sound stimulus there were value peaks. From another perspective, using Ledalab also enabled the easier perception of these peaks with more detailed graphs when optimized.*          *Help, I need to put this too?*  (The following results are expected from this proposed STSM.  R1: A first draft of a research paper to be further extended and finally submitted for possible joint publication by the researchers in Polytechnic Institute of Viseu, Instituto de Telecomunicações, and DII. R2: A preliminary roadmap on a possible joint research activities to carry out within the topic of the STSM.) |

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| **FUTURE COLLABORATIONS (if applicable)** |
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