Research fellow 1 year post-doctoral (or engineer/master) position
ADRESSE project: Application for the Detection and REgulation of StresS and Emotions during Space Missions

Title: "Application for the Detection and REgulation of StresS and Emotions during Space Missions"

1- Administrative information

Position: 12 month post-doctoral (or engineer/master) position in the 2LPN lab (Laboratoire Lorrain de Psychologie et Neurosciences de la Dynamique des Comportements : 2LPN, EA 7489, http://2lpn.univ-lorraine.fr/) of the university of Lorraine (http://www.univ-lorraine.fr/)
Funding: CNES (French Spatial Agency)
Salary: from 1800€ to 2300€ per month (net salary) depending on experience
Location: 2LPN, Bridoux campus, Général Delestraint St, 57000 METZ
Period: from January 03, 2023 to January 03, 2024
Application: send a detailed Curriculum vitae and a cover letter to benoit.bolmont@univ-lorraine.fr
Contact: Benoit Bolmont, 2LPN, University of Lorraine, phone: 03 72 74 90 13, email above

2. Host team, partnerships and funder

The ADDRESS project is led by a team of researchers from 2LPN lab and funded by CNES (French Spatial Agency). The members of 2LPN involved in this project have developed expertise over the past twenty years in the field of physiological, psychological and cognitive evaluation of stress and emotions in various contexts, particularly in extreme environments (parabolic flights, simulated space missions in isolated and confined analog environment, simulated climb of mount Everest in a decompression chamber, caving mission, etc.).

3. Background

During long-duration space mission, astronauts are confronted with many sources of stress that can modify their behavior. Under certain circumstances, these modifications can alter their level of functioning and endanger the mission. The aim of the ADRESS project is to help astronauts manage their affective states. This project aims to develop an application that can be used on tablets, to quantify their stress level, identify their affective states and regulate them. The stress level will be assessed, among other things, by collecting physiological data from wearable sensors.

4. Job assignment

The main technological problem of this project is to collect heterogeneous data, to process them and to merge them in order to determine the level of stress and the inherent affective states of the person.
In this context, the job assignments are multiple:

1. Selection of relevant wearable sensors; signal extraction, filtering and processing
2. Interfacing with an application on a tablet
3. Development of a supervised classification tool
4. Overall architecture programming of the application (backend)

5. Profile sought

The applicant should hold a PhD (or engineer's/master's degree) in the general field of electronics, digital processing and control engineering or similar. The applicant must have a relevant expertise in the field of physiological signal processing. Skills in Graphic User Interface programming are also expected. Programming skills in the Apple development environment would be appreciated.

6. Références

[1] Collado A., Monfort V., Hainaut JP., Rosnet E., Bolmont B. (2013) Personality traits of people attracted by parabolic flight. *Aviation, Space and Environmental Medicine.* 84: p1-5.

[2] Collado A., Langlet C., Tzanova T., Hainaut J.-P., Monfort V., Bolmont B. (2017) Affective states and adaptation to parabolic flights. *Acta Astronautica*.134: p98-105.

[3] Collado A, Hainaut JP, Monfort V, Bolmont B. (2018) Sensation Seeking and Adaptation in Parabonauts. *Frontiers in Psychology* (9) 296.

[4] Nicolas M, Bolmont B. (2020). Les défis psychologiques ; sous la direction de Custaud M.-A., Blanc S., Gauquelin-Koch G., Gharib C. L'humain & l'espace – ses adaptations physiologiques, pp 223-238.

[5] Zhang B., Sieler L., Morere Y., Bolmont B., Bourhis G., (2018). A modified algorithm for QRS complex detection for FPGA implementation. *Circuits, Systems, and Signal Processing*, 37:7 (3070-3092).

[6] Zhang B., Morere Y., Sieler L., Langlet C., Bolmont B., Bourhis G. (2016) Stress recognition from heterogeneous data. *Journal of Image and Graphics,* 4(2):116-121.

[7] Zhang B., Morere Y., Sieler L., Langlet C., Bolmont B., Bourhis G. (2017) Reaction Time and Physiological Signals for Stress Recognition. *Journal of Biomedical Signal Processing and Control*. 38: p100-107.