

Post doc position at ISAE-SUPAERO – Neuroergonomics and Human Factors Department (Toulouse, France)

HYPERSCAN Project: Real-time monitoring to improve cooperation between 2 humans

Context: The Neuroergonomics and Human Factors research team is currently involved in the Hyperscan project dedicated to improve the collaboration between two distant humans (i.e. not in the same place). This project aims at implementing hyperscanning techniques that allows the simultaneous recording of cerebral activity of multiple brains.

Objective: The challenge of this post-doctoral position will be to design two Brain Computer Interfaces (pBCI) to

- Assess the levels of engagement and cooperation between two distant humans in an on-line fashion.
- Trigger solutions to improve the situation awareness and level of cooperations between the different humans involved in a common task.

The candidate will have to: 1) design the pBCI using EEG/fNIRS; 2) identify the relevant neural markers of engagement and cooperation; 3) conduct experiments with a significant sample of participants. The candidate will work in cooperation with another post-doctoral fellow who has a strong background in physiology.

Supervisors: Prof. F. Dehais (frederic.dehais@isae.fr), Dr. C. Chanel (caroline.chanel@isae.fr) and R. Roy (raphaelle.roy@isae.fr)

Candidate's profile - for EU citizens:

- Brain Computer Interface
- Neurophysiology (EEG or fNIRS)
- Machine learning/ automated planning

Start & duration: May 2019 - March 2020

Location: Toulouse, France – ISAE-SUPAERO - Neuroergonomics and Human Factors Team (DCAS): <https://www.isae-supaeero.fr/fr/videos/isae-supaeero-neuro-ergonomics-and-human-factors-scientific-research/>

Dehais, F., Duprès, A., Blum, S., Drougard, N., Scannella, S., Roy, R. N., & Lotte, F. (2019). Monitoring Pilot's Mental Workload Using ERPs and Spectral Power with a Six-Dry-Electrode EEG System in Real Flight Conditions. *Sensors*, 19(6), 1324.

Dehais, F., Roy, R. N., & Scannella, S. (2019). Inattentive deafness to auditory alarms: Inter-individual differences, electrophysiological signature and single trial classification. *Behavioural brain research*, 360, 51-59.

Gateau, T., Ayaz, H., & Dehais, F. (2018). In silico versus over the clouds: On-the-fly mental state estimation of aircraft pilots, using a functional near infrared spectroscopy based passive-BCI. *Frontiers in human neuroscience*, 12, 187.