Post Doctoral Position
Neuroergonomics and Human Factors Team
DCAS / ISAE-SUPAERO
Toulouse, France

MAIA Project: Implementation of real-time solution to detect and mitigate inattentional deafness to auditory alarm in simulated and real flight conditions

Context: Individuals often have reduced ability to hear alarms in real world situations (e.g. flying an airplane) when their attention is focused on another task, sometimes with devastating consequences. This phenomenon, known as inattentional deafness, usually occurs under critical high workload conditions such as in aviation related tasks. Experiments conducted at ISAE-SUPAERO in simulated and real flight conditions, using electro-encephalography (EEG), have shown that inattentional deafness to auditory alarm could take place in the cockpit. Moreover, the analyses of the neurophysiological signals allowed to identify neural markers and precursors related to this phenomenon.

Objective: The challenge of this post-doctoral position will be to implement a passive brain-computer interface (pBCI) to 1) predict the occurrence inattentional deafness and, 2) to develop a stochastic-based decision system to dynamically adapt pilot-cockpit interaction to mitigate this phenomenon. Experiments will be conducted in motion flight simulators and real airplane conditions. The post doc will directly cooperate with another post doc fellow – also hired for this project - who has a background in neuroscience and electrophysiology.

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** and **American** citizens**:**

- Artificial intelligence, Automated Planning (MDP, POMDP), Machine-Learning (supervised/unsupervised classifiers)
- Brain Computer Interface
- Brain connectivity
- Software Architectures

Start & duration: The position starts in January 2019 for a duration of 36 months.

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

References:

Callan, D. E., Gateau, T., Durantin, G., Gonthier, N., & Dehais, F. (2018). Disruption in neural phase synchrony is related to identification of inattentional deafness in real- world setting. *Human brain mapping*, *39*(6), 2596-2608.

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Dehais, F., Causse, M., Vachon, F., Régis, N., Menant, E., & Tremblay, S. (2014). Failure to detect critical auditory alerts in the cockpit: evidence for inattentional deafness. Human factors, 56(4), 631-644.

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