**The influence of stress, uncertainty and systems opacity on human-machine interactions**

A PhD position is available at the French Aerospace lab (ONERA) in Salon-de-Provence, France. The successful candidate will be supervised by Dr. Stefania Ficarella and Dr. Andrea Desantis of the cognitive engineering and applied neuroscience unit. The Unit counts 13 permanent researchers, 2 post-docs, 12 PhD students and several interns. It conducts research at different levels ranging from fundamental research in neuroscience to applied research in ergonomics and it is based on a highly multidisciplinary approach.

**The topic**

Many human activities rely on interaction with automated systems. Automation certainly makes our lives easier and safer. However, it also creates new challenges for those responsible for operating automated systems. In effect, automation shifts the role of active controllers to supervisors, which systematically reduces operators’ experience of control. This loss of control is exacerbated by the fact that the systems are increasingly more complex and opaque. Indeed, current systems tend to operate through automatic sequences of actions that reduce, or even eliminate, the ability of human operators to predict and understand the actions of the artificial partner. In case of failure of the automated system, this can create difficulties for the operator to understand the current situation and to decide if an intervention is necessary. The opacity of automated systems also seems to increase the stress level of the human operator.

This thesis project aims at highlighting the impact of stress, system opacity and uncertainty on the interactions between humans and automated systems. Experimental psychology methods will be coupled with electroencephalography and eye tracking techniques, in order to extract informative metrics of the level of stress and uncertainty experienced by individuals when making a decision.

**The candidate**

We are looking for highly motivated candidates with a Master’s degree in cognitive science, neuroscience, cognitive psychology, physics or engineering. Programming experience (Matlab, Python, R or other languages) is strongly desirable and some experience with EEG or eye-tracking would be a plus. A good level of English is essential and a good level of French is strongly desirable.

**How to apply**

Please send your application (CV, letter of motivation, and the names and email addresses of two persons who can provide recommendation letters) to Dr. Stefania Ficarella [stefania.ficarella@onera.fr](mailto:stefania.ficarella@onera.fr) or Dr. Andrea Desantis [andrea.desantis@onera.fr](mailto:andrea.desantis@onera.fr) before the 31st of March 2023.