LIS

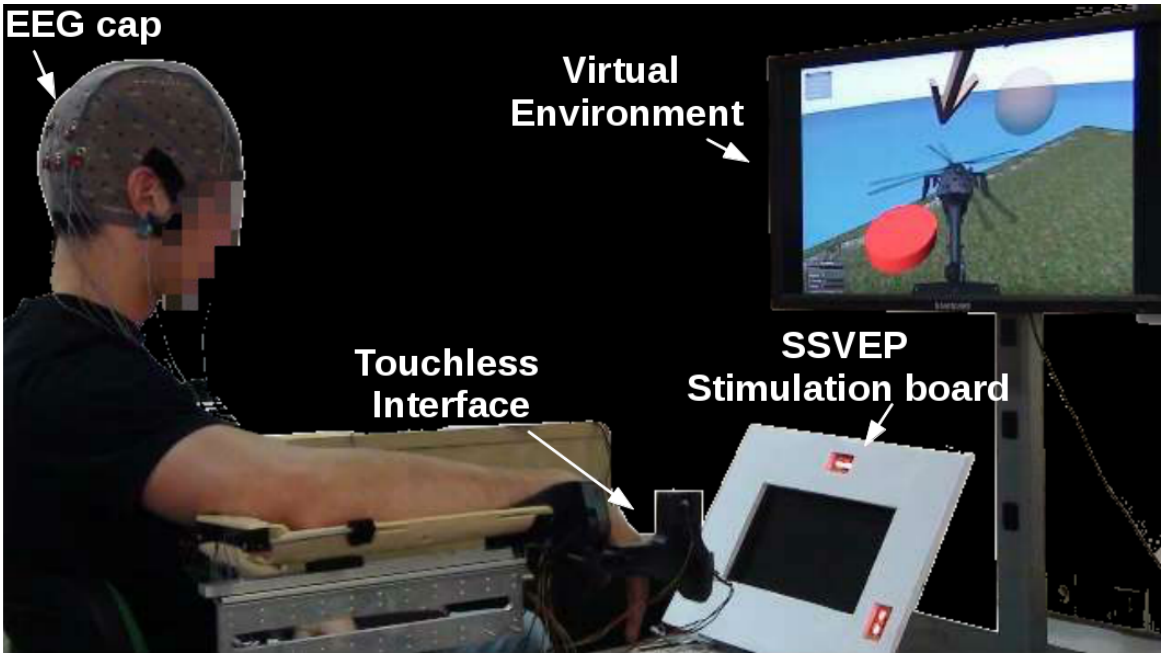
Laboratoire d'ingén
des systèmes de Vers

PROJET RI - HYBRIDE BCI

Combining brain and physical interfaces

Brain interfaces could help to interact with systems, either a computer or a machine, when the motor response is not reliable or painful. Nevertheless, brain interfaces are difficult to use and require sustain attention, that is quickly exhausting.

We develop at LISV an hybrid approach to combine both physical and brain signal, to control an arm exoskeleton (ESTA) with both hand movements and steady-state visually evoked potentials (SSVEP). The switch from one interface to the other is made with a brain interface, enabling the user to switch controls while holding an object with her hand.



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Partners/Collaboration : Afrique du Sud

Keywords: BCI, navigation, hybrid controler, rehabilitation

Support: ICODE

Link: https://sylvchev.github.io/projects/02_hybridbci/

Selected publications :

[1] SSVEP enhancement based on Canonical Correlation Analysis to improve BCI performances Kalunga, Emmanuel K., Djouani, Karim, Hamam, Yskandar, Chevallier, Sylvain, and Monacelli, Eric In AFRICON, 2013

[2] Hybrid interface: Integrating BCI in multimodal human-machine interfaces Kalunga, Emmanuel K., Chevallier, Sylvain, Rabreau, Olivier, and Monacelli, Eric In IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM), 2014

[3] E. K. Kalunga, S. Chevallier, Q. Barthélemy, K. Djouani, E. Monacelli, Y. Hamam, “Online SSVEP-based BCI using Riemannian geometry”, Neurocomputing, vol. 191, p. 55-68, 2016.