Post-doctoral fellowship - 12 month
Basketball & Virtual reality – UMR7287, Marseille, FR

General Information

Topics: Visual Information; Perception-Action Coupling; Learning; Sport; Motion Capture; Virtual Reality
Lab: UMR 7287 CNRS & Aix-Marseille Université *« Institut des Sciences du Mouvement Etienne-Jules MAREY »*
Location: Marseille (Campus « Luminy »), France
Employer: *Institut Carnot STAR*, Marseille, France
Duration: 12 month with potential prolongation dependent upon other available funding.
Compensation: 1947.13€/month
Starting Date: available until March 1st, 2017
External Collaboration: *MimeTIC* research team, Institut Carnot INRIA, Rennes
Contact: Antoine MORICE
UMR 7287 CNRS & Aix-Marseille Université *« Institut des Sciences du Mouvement Etienne-Jules MAREY »*, Marseille, France
antoine.morice@univ-amu.fr

Project

Context: The *Institut des Sciences du Mouvement Etienne-Jules MAREY* (UMR 7287, CNRS & Aix-Marseille Université) is located in Marseille (France). It is an interdisciplinary laboratory nationally recognized in movement sciences and excelling in the field of neurosciences and the use of virtual reality technics. The Technosport-AMU, a platform designed for innovation in Sports and Sciences Movement, provides optimal conditions to perform experimental research projects linked to sport. A research project initiated three years ago with an Aix-Marseille University funding already allowed to (1) design a basketball throw simulator based on virtual reality technics, (2) develop customized methods for identification of information picked up by players and (3) perceptual-motor learning methods.

Project description: We aims at continuing this work along two axis : (i) Identify the perceptual-motor strategies used by novices and experts when throwing and (ii) explore the possibilities to optimize learning via the simulator, based on theory, methods and protocols used in ecological psychology to identify perceptual variables used [1,2] and improve learning procedures [3,4].

1. François, M., Morice, A. H., Bootsma, R. J. & Montagne, G. Visual control Of walking velocity. *Neurosci. Res.* **70,** 214–219 (2011).
2. Morice, A. H., François, M., Jacobs, D. M. & Montagne, G. Environmental constraints modify the way an interceptive action is controlled. *Exp. Brain Res.* **202,** 397–411 (2010).
3. Huet, M., Jacobs, D. M., Camachon, C., Goulon, C. & Montagne, G. Self-controlled concurrent feedback facilitates the learning of the final approach phase in a fixed-base flight simulator. *Hum. Factors* **51,** 858–871 (2009).
4. Huet, M. *et al.* The education of attention as explanation of variability of practice effects: learning the final approach phase in a flight simulator. *J. Exp. Psychol. Hum. Percept. Perform.* **37,** 1841–1854 (2011).

In the project, the applicant will be in charge of the coordination of a set of procedures aiming at integrating a virtual opponent in the simulator in collaboration with the *MimeTIC* team of the Institut Carnot INRIA in Rennes. The following developments have been identified for the project continuation:

- Analysis of basketball opponent behavior in basketball and implications for designing an avatar;
- Preparation and specification of 3D motion capture data collection of opposition behavior;
- Motion capture of opposition behavior (*Qualisys*);
- Post-processing of motion capture data and collaboration with the *MimeTIC* team (deliverable: opposition sequences; additional post-processing);

- Design of experimental protocol aiming at testing information pickup and perceptual learning relative to the virtual opponent.

Candidate's profile:

Formation: PhD in Movement Sciences, Sport Sciences (neurosciences, motor control, biomechanics), Kinesiology or related fields.

Skills:
-        Real quality in project management and organization of experimental procedures;
-        Theoretical background: perception-action coupling, virtual reality, biomechanics;
-        Technical skills: real experience in experimental psychology, motion capture, scientific programming;
-        Ability to work within a team and especially in close collaboration with the project's coordinator for all phases of the project (developments, tests, experiments and data processing);
-        Languages: Good oral and written skills in English or French are required.

Please contact Antoine MORICE to collect supplementary information's relative to the position to Antoine MORICE. Interested applicants are encouraged to send a Cover letter, a curriculum vitae, copies of PhD diploma and names and email for two references (one of whom should be a former PhD supervision).