

PARTICIPANT FORM for the SUMMER SCHOOL

Constructivism and Enaction

A new paradigm for Cognitive Science

FIRSTNAME : Michel **NAME** : DUFOSSÉ



I. – SITUATION

Status : University teacher **Research scientist** Thesis student Post-doc Other :

University/ Laboratory : **UMR-S INSERM U742 - UPMC (Paris 6)**

Website labo/perso : **<http://anim.snv.jussieu.fr/>**

Special information(s) (article, scientific responsibility, participation to research projects, other...) :

Dufossé M. et al. (2003) Cerebro-cerebellar inspired neural network for manipulator movement control. In: "*Proc Int. Symp. Comput Intell. and Robotics Automation*". July 16-20, Kobe, Japan.

Bensmaïl S., Dufossé M., Ouezdou F.B. (2006) Learning control of humanoid robots through human computational principles. In: "*Proc. Int Conf. on Intell. and Robots and Systems*". Oct. 9-15. Beijing, China.

Participation in

CNRS-ROBEA, Project SimBioMan " Simulation Biomimétique de la Manipulation"

ACI-CNRS, Project "Dynamique temporelle des réseaux neuronaux dans l'apprentissage visuomoteur".

PI- TCAN, Project "Modélisation de l'apprentissage de séquences dans les ganglions de la base par les outils de l'intelligence artificielle et "satisficing learning".

III. – RESEARCH THEME

Please indicate briefly (10 lines max) your themes of research, and 4 or 5 key words

Enactive brain decision-making mainly involves the frontal basal cortex and the ganglia. Controlling an unstable "inverted pendulum" by moving the supporting hand, is a classical problem that has been studied by many methods, i.e. differential equations, fuzzy logic, neural networks, humanoid robots with mimetic learning.. Here, the autopoietic system is the inverted pendulum together with its support (human or robot). Its crucial goal is. "not to fall", despite internal or external perturbations, respectively hand movements supporting the inverted pendulum and laws of gravity.

Within the enaction paradigm, quantum mechanics reflects a situation of inseparability between the object and the instrument being used for its experimental investigation. According to this idea (M. Bitbol), quantum mechanics does not provide an image of nature, but only "the image of our relationship with nature". Doesn't the brain provide, rather than an image of the world, an image (conscience) of the relationship between our body and the world?

Keywords: brain, basal ganglia, decision-making, quantum mechanics

III. – VIDEOS AND EXPERIMENTAL MATERIAL

Moments of relaxation might be the occasion to share and show original scientific video documents (not too long) or experimental material (which could be used by all the participants). A video party and an experimental demonstration session have been planned. Could you indicate video or experimental material you would like to present.

Videos : No

Experimental demonstration : No