Post-Doc Position on Mechatronics at [LAAS-CNRS](#), Toulouse, France

Designing a prototype of a metastable passive walker

Scientific goals: The subject is part of the ERC [Actanthrope](#) project led by Jean-Paul Laumond in the [Gepetto](#) team at LAAS-CNRS. Actanthrope promotes a neuro-robotics perspective to explore original models of anthropomorphic action. The project targets contributions to humanoid robot autonomy, to advanced human body simulation, and to a new theory of embodied intelligence by promoting a motion based semiotics of the human action.

In this frame, the goal of the post-doctoral position is to give an experimental proof of concept on the importance of an actuated head and trunk to passive walkers stabilization. In a previous work [1,2], we have shown in simulation that a controlled head on a passive walker can largely improve the stability (in the sense of Poincaré). This is true even on uneven terrain. In a recent work [3], we propose a simulation framework allowing optimizing the physical parameters of a robot implementing the proposed control law. This was achieved thanks to a codesign approach.

The next phase is to build the robot. For this we need a talented roboticist able to drive the project from the start to the end of the contract. She/he will be seconded by senior roboticists (including Olivier Stasse and Nicolas Mansard) and engineers involved in mechanics and software issues to achieve the goal. The candidate will be supported by the facilities available at LAAS.

Responsabilities:
- Managing the project from the design to the final test of the prototype.
- Designing and developing the electromechanical part of the robot
- Implementing the low-level control on the robot
- Analysis of the in-field experimentation for fixing.

Qualifications:
- PhD in mechatronics, electrical or mechanical engineering applied to robotics.
- Extensive experience with digital signal processing and embedded system development
- Experience in designing electromechanical systems
- Experience with rapid prototyping (e.g. 3D printing, laser cutting, and machining)

The position is open for 12 months, which is the deadline for providing the first prototype. An extension period will be considered in case of success.
Expected starting date is February 1st, 2017. Monthly gross salary is fixed by CNRS from 2515€ to 3488€ according to the applicant experience.

How to apply:
Please email your resume and portfolio with relevant work samples to Olivier Stasse <ostasse@laas.fr>

[1] M. Benallegue, J.P. Laumond, "Metastability for High-Dimensional Walking Systems on Stochastically Rough Terrain", Robotics Science and Systems (RSS), 2013.
[2] M. Benallegue, J.P. Laumond, "The Yoyo-Man", International Symposium on Robotics

Research, 2015, https://hal.archives-ouvertes.fr/hal-01175591

[3] G. Saurel, J. Carpentier, J.P. Laumond, "A Simulation Framework for Simultaneous Design and Control of Passive Walkers", 2016, https://hal.archives-ouvertes.fr/hal-01360450