Position Postdoc or Engineer:

Project: *Hexarotor endowed with native stable vision*

This project aims at realizing a demonstrator that meets the challenges raised by the exploration of narrow and confined spaces with micro aerial vehicles: (i) high maneuverability and precision while maintaining level the camera field-of-view, and (ii) exploration and return to the base station using only on-board sensors. To obtain the sought capabilities the project will investigate several advanced techniques, in particular:
- a fully-actuated hexarotor with advanced control laws,
- bio-inspired sensors and minimalistic processing to develop onboard low-drift localization and full autonomy capabilities in the absence of external localization system and communication, as well as in dim-light conditions.

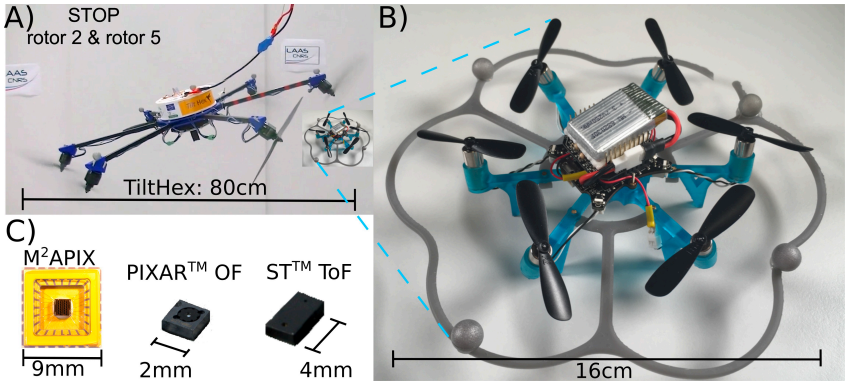

Figure 1: A) TiltHex fully actuated robot hovering with two rotor failures at LAAS (Franchi et al. 2018) (overall diameter: 80cm). B) 50-gram aerial robot with fixed tilted propellers to obtain full-actuation (overall diameter: 16cm) realized by ISM and INRIA in 2018. C) Foreseen light-weight sensors suite: M^2APIX autoadaptive retina for dim light optic flow measurement (Mafrica et al. 2016, Al Hage et al. 2018), tiny PIXAR optic flow sensor, tiny ST Time-Of-Flight distance sensor (range < 2 meters).

Duration: 18 months + extension
Funding: DGA/ANR-funded project: the French Defense procurement and technology agency -DGA- request to hire people from the EU or CH.
Net salary: from €1500/month net depending on the professional experience

Required profile:
- Knowledge in Control Theory, Electronics and Computer Science
- Taste for experimentation,
- Very good level of English (written and oral), TOEIC > 850.

Please send a CV and cover letter to :
Franck RUFFIER, Cnrs Research Director, ISM : franck.ruffier@univ-amu.fr

References:

A. Franchi, R. Carli, D. Bicego, and M. Ryll. Full-pose tracking control for aerial robotic systems with laterally-bounded input force. *IEEE Trans. on Robotics*, 34(2):534-541, 2018.
S. Mafrica, A. Servel, and F. Ruffier. Minimalistic optic flow sensors applied to indoor and outdoor visual guidance and odometry on a car-like robot. *Bioinspiration & biomimetics*, 11(6):066007, 2016.
J. Al Hage, S. Mafrica, M. E. B. El Najjar, and F. Ruffier. Informational framework for minimalistic visual odometry on outdoor robot. *IEEE Transactions on Instrumentation and Measurement*, 2018.