Internship proposal:
Conception of a Head for a Robotic Bird

Flapping-wings Unmanned Aerial Vehicles (FWUAVs) can perform complex maneuvers with less energy than conventional multirotor UAVs (Ndoye et al. 2023, video available at youtu.be/zuTESLJGNGM). Nonetheless, flapping-wing UAVs are limited in matters of flight endurance and payload-carrying capabilities as well as in terms of autonomy. Onboard sensors' reliability is affected by the oscillatory movement of the flapping wings.
The main goal of this internship is to endow the MetaFly vehicle with a light-weight self-sustained head such that this head remains parallel to the ground regardless of the FWUAV in-flight orientation. The inspiration behind this idea is that such feature may improve flight performance and landing accuracy as it will permit to embed and to stabilize vision-based sensors.
The internship will take place at the Bio-robotics Lab which is an example of real transdisciplinary research department. The team's research efforts and expertise focus on the study of the behavior and the vision system of invertebrates (especially fly and bee), their sensorimotor control feedback loops and the development of bio-inspired robotic platforms.
In this internship, you will be working with 3D printers, microelectronics, Arduino (or similar), diverse mechanical tools and mathematical software (Matlab mainly); to these ends, the laboratory facilities include a mechanical workshop, an electronic workshop and a fully-equipped flight arena.

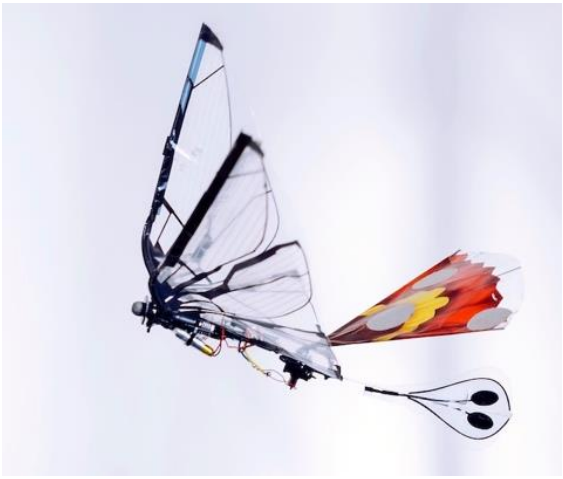

Figure 1: MetaFly (XTIM) FWUAV at the flight arena of the ISM, Marseille (Ndoye et al, IEEE ICRA 2023).

Ndoye, A., Castillo-Zamora, J. J., Samorah-Laki, S., Miot, R., Van Ruymbeke, E., & Ruffier, F. (2023, May). Vector Field Aided Trajectory Tracking by a 10-gram Flapping-Wing Micro Aerial Vehicle. In *2023 IEEE International Conference on Robotics and Automation (ICRA)* (pp. 5379-5385). IEEE.

Duration: 4 to 6 months at the first semester of 2024
Funding: 4.35 €/h (670 €/month)
Profile: Highly motivated, self-taught, independent, passionate for robotics, good English level, hands-on-action, control theory basics, programming, mechatronics.
Place: ISM, Systemes bio-inspirés, Campus de Luminy (Parc National des Calanques), Marseille

Please send a CV and cover letter to:
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