



## Thesis Project Form

**Title (tentative):** Deciphering the novel principles of the octopus motor control

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### Description

#### Motivation and application domain

The octopus is an outstanding example of complex multi-functional behavior in a soft bodied animal. With its long, flexible arms and highly developed brain, the octopus has been an excellent source of inspiration for soft robots at least for the last 10 years . In this project, we aim at deciphering the organization of the arm motor control system employing techniques of in vivo brain recordings, spike sorting and motion kinematics.

#### General objectives and main activities

The goal of this thesis project is the characterization of octopus motor responses.  
In order to accomplish this goal, the thesis has different aims:

- set up video recording system to record animal motion
- set up an in vivo recording system to monitor the activity of motor areas during motion in a freely behaving animal
- perform spike sorting analysis on in-vivo recordings

#### Training Objectives (technical/analytical tools, experimental methodologies)

1. Design and test electrodes for in-vivo recordings (single or multiple endings)
2. Data acquisition
3. Data analysis, application of spike sorting algorithm and/or kinematic analysis
4. Design experimental paradigms of motion display

**Place(s) where the thesis work will be carried out:**

### Additional information

**Maximum number of students:** 1