



## Thesis Project Form

**Title (tentative):** Investigating the embodiment of a supranumerary limb

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### Description

#### Motivation and application domain

The sense of body ownership can be plastic. Several studies investigated ownership towards substitute artificial limbs, which are controlled by the movements of a real limb and/or limbs from which non-visual sensory feedback is provided on an existing limb.

#### General objectives and main activities

The thesis specifically aims at studying the embodiment of a sixth finger. Experiments will be designed to assess changes in self-location (proprioceptive drift) by investigating the role of action (free self-touching vs. free environment touching) in driving a recalibration of the felt position of the hand plus the sixth finger. Experiments will consist of three phases:

- 1/ Self location baseline. Self-perception of the augmented hand (sixth finger) is assessed through proprioceptive judgement tasks after reaching movements.
- 2/ Training. Participants are divided in two groups: a test group (T) is trained through free self-touching, whereas a control group (C) is trained through free environment exploration.
- 3/ Self location after adaptation. The proprioception of position test is repeated to calculate the proprioceptive drift.

Questionnaires will be used to find relations between objective and subjective measures.

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

Design and fast prototyping of a simple active device to enable a sixth finger.  
Conduction of psychophysical experiments.  
Data analysis in MATLAB/R and interpretation of results.

**Place(s) where the thesis work will be carried out:** Bioengineering Lab (PSPC), via Opera Pia 13

### Additional information

**Maximum number of students:** 2