



## Thesis Project Form

**Title (tentative):** Non-invasive electro-cutaneous stimulation coupled to virtual reality system for restoration of primitive sensory touch

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### Description

#### Motivation and application domain

Modern prostheses aim at restoring the functional features of the lost limb. To foster prosthesis embodiment and functionality, it is necessary to re-establish both volitional control and sensory feedback. To this motivation, a noninvasive electrotactile stimulation system coupled to virtual reality simulation program will be developed for restoration of primitive tactile sensations.

#### General objectives and main activities

A noninvasive electrotactile stimulation system coupled to virtual reality simulation program will be developed for restoration of primitive tactile sensations. The developed system (i.e. the virtual reality simulation "electrotactile stimulation system") will be controlled through a graphical interface developed in Matlab and tested. Afterward, some observational pilot tests will be done on healthy subjects in order to illustrate the effectiveness of the proposed system.

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

The student will learn to employ an array of methodologies and instrumentation, including: Matlab, virtual reality (V.R.) simulator, electrocutaneous stimulation system. The student will gain insight on upper limb prosthetic devices and the way to give back to the amputee a tactile feedback.

**Place(s) where the thesis work will be carried out:** COSMIC Lab - DITEN [www.cosmiclab.diten.unige.it](http://www.cosmiclab.diten.unige.it)

### Additional information

**Pre-requisite abilities/skills:** MatLab

**Maximum number of students:** 1