UNIVERSITA' DEGLI STUDI DI GENOVA
DIPARTIMENTO DI INFORMATICA, BIOINGEGNERIA, ROBOTICA E
INGEGNERIA DEI SISTEMI
CORSO DI LAUREA MAGISTRALE IN BIOINGEGNERIA

Dibris

Scheda di Offerta Tesi

Titolo (provvisorio): Quantitative perceptual characterization of interaction with objects: from experiments to computational principles

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Descrizione

Motivazione e campo di applicazione

Usually objects' percepts (such as color, shape, texture) are considered static qualities. More generally, they should be considered dynamic processes, especially when considering interaction.
The claim is that interaction (i.e. the dynamic and active collection of sensory data) intrinsically determines the consciously and unconsciously perceived qualities of objects.

Obiettivi generali e principali attività

To assess whether agents engage actively with their sensorium so as to maximize the spatiotemporal changes in the sensorial flow, (e.g., contrast, color, binocular disparity, motion field).
Main activities :
- To design and prototype sensorized objects with known 3D models that will be used in interaction tasks. The experimental apparatus will also include an eye tracker, IMUs and a tracking system to characterize object's position and subjects' actions.
- To collect data (behavioral and physiological) from subjects while performing a variety of manipulation tasks.
- To reproduce the same setting in VR to derive the true active binocular visual flow experienced by the subjects.
- To analyze the visual data and to correlate them with behavioral data to characterize the expected spatiotemporal contingencies of sensorimotor events.
The experiments will be designed jointly with the development of models to investigate how contingent sensorial information can influence human experience or alter perceptual judgement.

Obiettivi di apprendimento (strumenti tecnici e analitici, metodologie sperimentali)

System solutions and applications

The student will learn to employ different methodologies and instrumentations, including:
- 3D printing
- IMU and pose-tracking sensing
- Eye tracking
- Virtual reality
- Psychophysics
- Computational modeling

Luogo/i in cui si svolgerà il lavoro: DIBRIS Bioengineering Lab (Via Opera Pia 13)

Informazioni aggiuntive

Numero massimo di studenti: 2