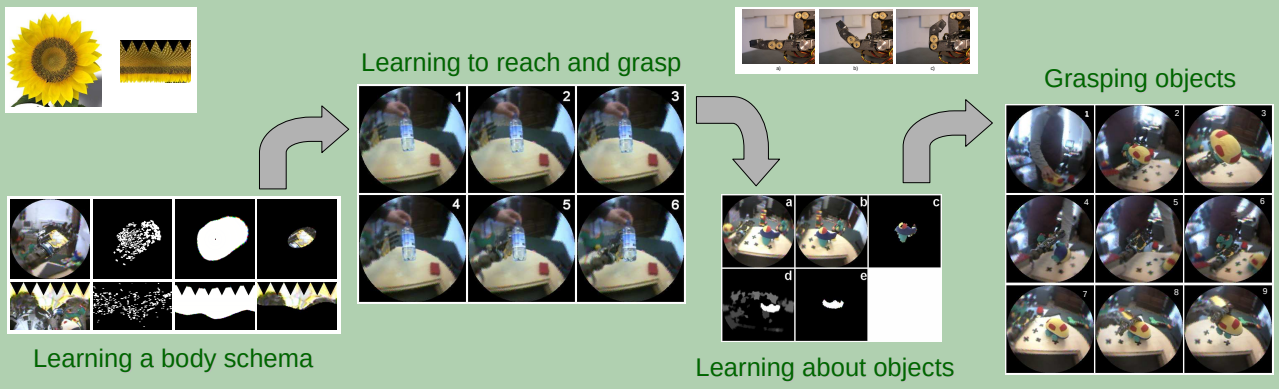
Artificial Development Approach to Presence Technologies

Development on Robotic Systems

We are investigating the development of representation in robotic systems through the interaction with the environment. We are conducting experiments following two approaches to machine learning: self-supervised and unsupervised learning

Learning what:

1. Learning sensorimotor coordination through the interaction between the robot and the environment. The robot learns about its body, about reaching, and eventually about the objects it encounters in the environment
2. Unsupervised learning is used to learn efficient representations of the multisensory data impinging on the robot's sensors. Learning is hierarchical and task directed including motoric signals into sensory representations



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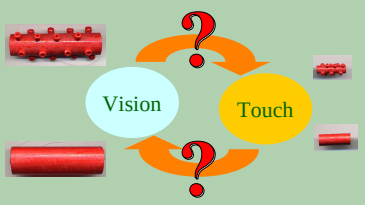
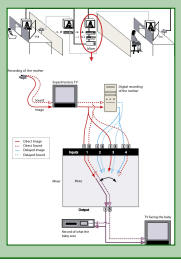
Development in Human Infants

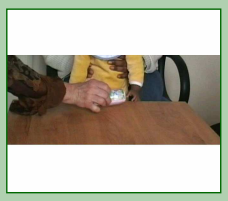
1. Investigating the unity of haptic and visual representation at birth by testing if a visual property of an object is transferred into an haptic property and vice-versa

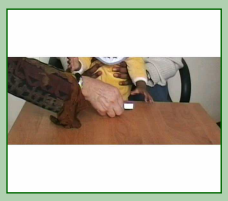


2. Studying how contingency influences multimodal perception: i) at two months it was found that the number of imitations decrease if the mother is not contingent, which might account for a lesser perception of the sense of agency and eventually to the detection of one's own agency in the mirroring of other's behaviors; ii) at six months, separate or joint contribution of vision and sound is investigated



3. Studying the acquisition of object affordances in human infants by i) looking at the spontaneous reaching and grasping and ii) reaching and grasping after the experimenter has shown a non-affordant action





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