ADAPT

Artificial Development Approach to Presence Technologies

ADAPT in brief

The sense of presence arises from the perception of the relationship between our body and the environment and originates from our senses as well as from our past experience. The main objective of ADAPT is to study how the perception of the self in the environment emerges during the early stages of human development and to implement an artificial instance of such developmental processes in an embodied artifact. In particular we propose to investigate the process of building a coherent representation of visual, auditory, haptic sensations by employing a twofold strategy: on one side we aim at realizing an artificial system capable of building internal representations through the interaction with the environment, and on the other we investigate when and how the developing brain starts to produce the unique experience-based repertoire of intentional percepts and actions.

The main objective of ADAPT is to study the process of building a coherent representation of visual, auditory, haptic sensations and how this representation can be used to describe/elicit the sense of presence. The goal is the 'understanding' of what representations are in humans and machines. We pursue this in the framework of development: i.e. by studying the problem from the point of view of a developing system. Within this framework we use two methodologies: on one side we investigate the mechanisms used by the brain to learn and build this unified representation by studying and performing experiments with human infants; on the other side we use artificial systems (e.g. robots) as models and demonstrators of perception-action representation theories (see Figure 1).

Content of our exhibit

We will present our latest progress on the implementation of the developmental model in a humanoid robot including sophisticate manipulation abilities. This will be presented in the form of videos of various experiments. Also, in parallel, we will show videos of the experiments we carried out on newborns and young infants on the development of multi-modal representation and affordances of objects (on manipulation as well). The conceptual work of modeling development will be presented by means of posters.

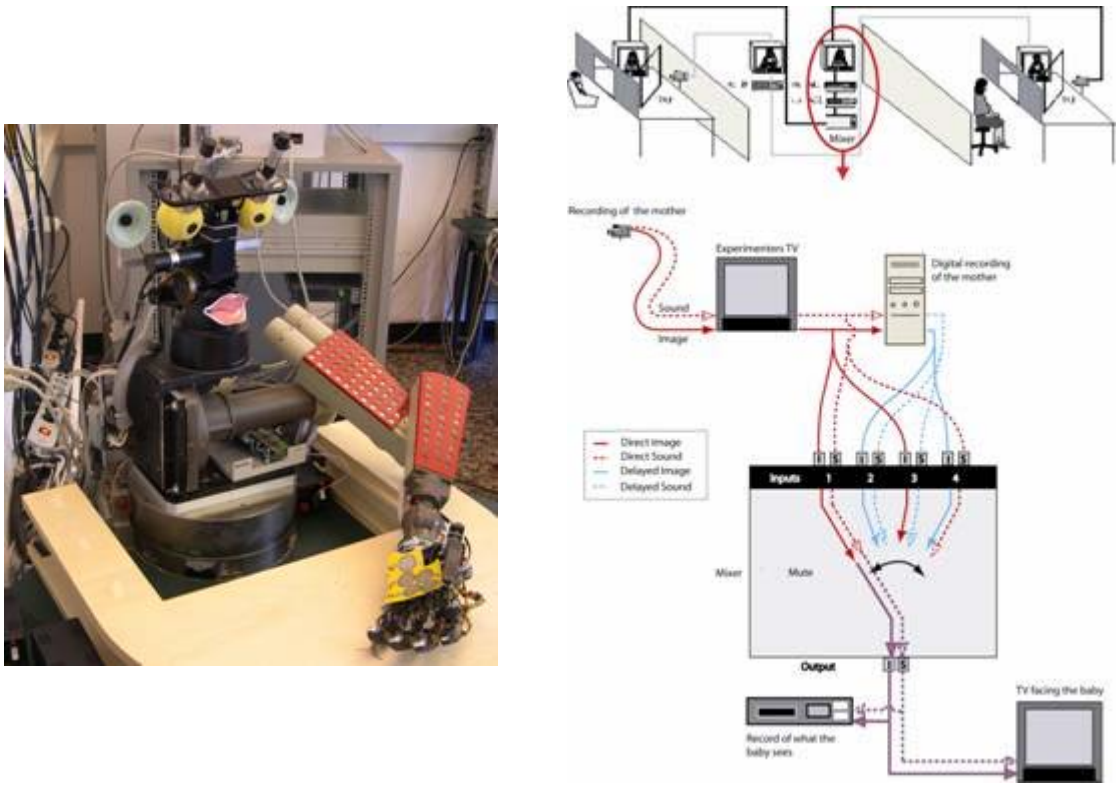

Figure 1: ADAPT's experimental setups. The panel on the left shows the humanoid robot upper torso used for experiments on multi-modal object representation. The figure on the right is the schematics of the experimental apparatus used to study multimodal contingency on infants.

Consortium

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For more information: http://www.liralab.it/adapt