Evidence for Intersubjectivity

One set of interaction skills evident in human and chimpanzee infants can be seen in the ‘Social referencing paradigm’ consisting of a novel object, infant & caregiver:

Gaze alternation between caregiver and object establishes they are jointly engaged

The emotional message sent by the caregiver serves a behavioral regulation function (see also WP4 and WP6).

Learning Motor skills for Robots by demonstration

Hard-coding a robot to carry out a specific task is time consuming and typically requires expert knowledge. Learning by demonstration provides an approach which can facilitate the transfer of a skill immensely while being more robust to perturbations - thus making the robot more versatile. The procedure is illustrated for the task of teaching the humanoid robot HOAP3 to execute the 2-step task of feeding itself and a doll.

Learning Complex Paths through interaction

Using a leash, a human care-giver is correcting a mobile robot and teach a path between several different places (grey curve).

Learning the timing of the orientations and the dynamics of the moves provides a fast learning of complex sequences, but with no accurate-reproduction (light blue curve).

Learning the place-action associations involves a slower teaching procedure, but robustly anchor the sequence in the visual places (dark blue curve).

Tracking Facial Features

Tracking of Facial Features → Head Pose and Eye Gaze Estimation → User Attention

- Only a web-camera in front of the user
- No special lighting conditions, real-time
- Ideal for a broad spectrum of applications: user attention, pleasure and engagement as non-verbal feedback