

## **Participatory robotic activity design for Autism Spectrum Disorder (ASD) therapy**

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Social Robots could offer the opportunity to deliver semi-automated and independent interventions, enable therapy to be delivered over a distance, enable inclusive and collaborative therapy/education environments and personalise treatment procedures which make them promising tools in ASD therapy (Fig. 1) with positive preliminary results. However, their usability is often limited. This limits their dissemination and assesment of their efficacy. We hypothesize that robots would be more used after following a co-design design approach with end-users and their caregivers. What would be the best appearance of a robot? Which sensors, motor to use and for which activities with children with ASD (their parents and/or typical mates). A focus on sensori-motor synchronization difficulties beyond high level social abilities seems promising for understanding of ASD and development of therapy.

We propose focus groups of 8 parents of children with ASD, individuals with ASD, therapists, and engineers with discussion and simulation of several social robots to identify the most relevant: Our protocol includes one-on-one interviews and focus group meetings with 8 parents of children with ASD, individuals with ASD, therapists, and engineers. Recorded sessions will include a participatory design workshop where a simulation of several robots will be showcased followed by a round table discussion. Recordings will be transcribed and a thematic analysis will be conducted to highlight: - the challenges of the care ecosystem to target. - Information and training related to the child's cognitive functions during the interaction with the robot (i.e., sensorimotor difficulties and motor coordination, speech, turn-taking, communication and language, imitation, emotion detection, and communication training), - robot role (i.e., peer, tutor, medium, learner), - robot form (e.g., tangible, humanoid, toy-like), - effectors (e.g., movements, haptic feedback, lights, songs, speech), - robot sensors (e.g., to detect noise, movements, synchrony, stress, gaze) will be extracted from audio and video recordings. Then, guidelines and design protocols to develop and personalize robots for children with ASD will be defined.