

# Short research statement: Impact of Robot's embodiment during robot interventions for autistic children

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My work at the Human-Media Interaction lab at the University of Twente is done within the DE-ENIGMA project (European Union's Horizon 2020 research and innovation program under grant agreement No 688835). We aim to develop a novel intervention for teaching emotion recognition to autistic children through the use of robots. My interest is on finding how the humanoid robot's embodiment can have an impact during interventions for autistic children and how we can use this knowledge to increase intervention success.

Looking at visual processing impairment in autism spectrum disorder [1, 2 for a review on visual impairments in autism] can be a starting point for such investigation as these visual behaviors leads to difficulties in learning social behavior in autistic children and can explain parts of the attraction or avoidance of an object or a social partner. A humanoid robot can trigger abnormal gaze in children with autism by both of its appearance and movements. In the Childhood Autism Rating Scale (CARS) diagnostic tool description [3], the authors underlined the gaze avoidance in autistic children, and the visual avoidance of toys and educational materials. It has been since observed that autistic children tend to gaze more towards certain objects, as trains or computer, and less towards others as clothes or plants [4]. Regarding human interaction, it has been observed that children with ASD had impaired detection of biological motion compared to non-biological motion [5]. Visual dependency of children, adolescent and adult with autism has been shown to be an indicator of the intervention success: during my PhD, we observed in different studies that autistic participants relying on visual cues were more successful in joint attention, imitation and emotion recognition during intervention with a robot [6,7,8].

In the line of a future laboratory visit at the IIT, at the Social cognition in human-robot interaction laboratory, we seek for a collaboration with the DE-ENIGMA project. The goal of this collaboration will be to perform experiments in which we will observe the human behavior reacting to different robot body motions. Thanks to the collaboration with IIT, we will be able to use state-of-the-art equipment such as the humanoid robot Icube and sensors such as eye-trackers and EEG sensors. On the other hand, IIT will be participating in a well-established European project.

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