Social Robots and Autism: the Michelangelo Project

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Autism Spectrum Disorders are a range of developmental syndromes that imply impaired social interaction, communication and language as well as stereotyped and/or restricted behaviors. Typical approaches for the assessment of ASD and for its therapeutic intervention are usually performed in clinical settings[1]. Several experiences demonstrated the effectiveness of these approaches[2] but, at the same time its limits. In artificial contexts, as clinics or laboratories, the behaviors produced do not reflect the real life, introducing systematic and non-systematic bias to the findings. Moreover, the therapeutic intervention conduced in an irregular way, just few hours during the week, limits its beneficial effects. Furthermore, the intervention approach is not fully personalized. The Michelangelo project aims to overcome such limits through the use of technological tools. These can enable researchers to develop flexible personalized protocols, scalable for the clinical setting to the home scenarios[3]. In the Michelangelo project several technological tools are used. Environmental cameras, head mounted cameras and RGB-D cameras are used to collect behavioral data (i.e.: gazing, imitation …), while, at the same time, wearable technologies, such as EEG and ECG, are integrated to the system to gather biometrical information. The standard Early Start Denver Model[4,5,6] approach is integrated in the Michelangelo project with technological tools. In particular, social robots[7,8,9] are used as behavior elicitation instruments in the clinic setting.

The presentation will focus on the use of social robots as assessment tools for ASD as part of the Michelangelo project, introducing the methods and the models developed and showing the results obtained. Particular emphasis will be given to the perception and the exhibition of social behaviors as metric of social intelligence[10].

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Biography

Salvatore M. Anzalone received his B.S. in Computer Engineering (2004) and M.S.Degree in Intelligent Systems (2006) from the *University of Palermo*. From the same University he received his Ph.D. degree in Computer Engineering (2010), supervised by Prof. A. Chella and Prof. R. Sorbello. He collaborated with Prof. H. Ishiguro at the *Osaka University* during one year of his Ph.D. (2009) and during his post-doc year at *University of Padova* (2010), supervised by Prof. E. Pagello and Prof. E. Menegatti. He received a grant from the Japan Society for the Promotion of Science and from April 2011 to April 2012 he was a research fellow at the Intelligent Robotics Laboratory directed by Prof. H. Ishiguro at Osaka University (2011-2012). Since May 2012 he is a Post-Doc researcher at *University Pierre et Marie Curie* in Paris, France, working with Prof. M. Chetouani at the Institute for Intelligent Systems and Robotics (ISIR-UPMC). In November 2013 he visited again the laboratory of Prof. H. Ishiguro at the Osaka University thanks to a grant received by the Japan's National Institute of Information and Communications Technology. His research focuses on Personal Robots, in particular on the modeling of human identities and their behaviours, to give the robots the ability of interacting with people in a more strict, customized and reliable way. Last experiences at ISIR-UPMC in Paris involve the use of personal robots for autistic children in the FP7 European Project Michelangelo.