Technology-based aids for people affected by Autism Spectrum Disorder (ASD)

Cristina Gava, Peron Davide

Department of Information Engineering, University of Padova – Via Gradenigo, 6/b, 35131 Padova, Italy

Email: {gavacris, perondav}@dei.unipd.it

Abstract

Individuals affected by Autism Spectrum Disorder(ASD) are often unable to communicate in an appropriate way, they show strong difficulties in social interactions and in manifesting their affective states. The conventional techniques, used to improve the performances of these people in the everyday tasks, are observation-based and can require a lot of effort in terms of time and money, with limited results. Technology-assisted teraphies can result more powerful and fast.

Our aim is to analyze the current technology-based solutions that can help therapists in the treatment of people affected by ASD. These solutions exploit the joint use of human intelligence and artificial intelligence to improve the powerfulness of therapies and to allow a better integration of these individuals in the society. Examples of these type of aids are Virtual Assistants and Agents as therapeutic tools, wearable technologies or VR headset to help them in everyday communication and to improve their fundamental and social skills. An interesting field that can be analyzed is the use of robotic avatar instead of a therapist, in order to increase the usefulness of a therapy, improving the response and the interaction time of the disabled user.

I. Introduction

Autism Spectrum Disorder (ASD) is a term used to cover a very big set of disorders. In this field there are a lot of studies and experiments, but still is one of the most unknown **(DP says: forse unknown non il massimo come termine qui)** disease. The symptoms are well known, while the causes are mostly unknown. Nowadays, *screening tests* are used to classify a person as affected by ASD, but these tests have an high percentage of error (false positive or negative) and they can be administered on a patient at least 3 years old. For this reason, several techniques have been studied to wonder if a children has this disorder in the first 2 years of life.

II. Technical Approach

A. *Simulated Annealing*

B. *Jumping Ball*

C. *Genetic Algorithm*

III. Conclusions And Future Work