SOCIAL ROBOTS AND THEIR RELATIONSHIP WITH AUTISTIC CHILDREN

AUTISM

The primary issue with understanding autism, especially for individuals who are not aware of it, is that it does not have a set of codes or checkboxes. That is the reason autism is defined as a spectrum, specifically ASD (Autism Spectral Disorder)– covering a broad range of difficulties and issues that people affected by it can experience. This spectrum is limitless. For instance, one individual may have learning difficulties only while another has issues with verbal interaction. What makes diagnosing autism difficult is the fact that some children during early childhood, do not use verbal communication.

WHAT ARE SOCIAL ROBOTS?

With the lightning speed with which Artificial Intelligence is progressing, it is not surprising to encounter robots in places like classrooms and family rooms. No longer are robots being used just for fancy whims, but also for day to day task management. It is also being estimated that social robots, in just a few years, will also be included in rehabilitation programs in jails, prisons and juvenile homes to re-socialize individuals.

In such situations, it is not surprising that social robots are being integrated more and more in child development projects both inside as well as outside the classroom. Not only are these bots helping children develop a deeper empathy, but in terms of skills, they are helping children learn mathematics, language and reading.

BUT WHY INTRODUCE THEM TO CHILDREN WITH AUTISM?

For starters, there isn't enough man power or even resources available in all schools around the world to efficiently handle all of the individual needs of the children inside a classroom. Perhaps that is the reason that over 200 kindergarten schools in China have decided to introduce social robots to help their children as well as the teachers. Apart from this, as parents all of the world will agree, there aren't sufficient methods of treatment when it comes to children with autism. Considering that 1 in every 68 children is born with autism, a simple and straightforward classroom and teaching approach is just not enough for these children. This is where social robots come in. With more research, funding and studies, doctors, behavioral experts and researchers are in agreement that the social robots being used for treatment for ADS would improve. But most importantly, they would allow for the development of a more uniform code or prognosis and treatment.

HOW ARE THEY EFFICIENT?

Over the years, as social robots and their empathic abilities have been improved, a number of scientific studies have been undertaken in order to see how autistic children responded to such AI, so that more work could be done on this. Suffice to say, research has come up with ample evidence to support the theory that social robots make learning easier for children with autism.

- For starters, it has been seen that children, when administered knowledge through social robots, are more responsive to the physical world around them. Although there is tremendous variability in the interaction that children with autism have with robots, it has been noted that autistic children with anxiety or hyperactivity, tend not to react too vigorously or have increased heart rates when interacting with social robots.

- One such study found that autistic children showed increased social behaviors directed towards the individuals present in the room at the time of the study, when social robot that they were interacting with looked more robot than human, that is to say, when the robots looked like robots, they had an easier time interacting with them than with the humans. Most researchers suspect that this may be the key to gradually integrating autistic children into every day society and situations, and developing an empathetic mindset in them.
- Another study showed that certain autistic children showed a tendency to mime the actions of the social robot, rather than a human individual even though both were undertaking the same task. For instance, if both a human and a robot threw a ball, the child did the same only after watching a robot. This suggests that teaching and improving skills in autistic children could be achieved considerably faster with the use of a social robot.
- Another theory suggests that improving behavioral aspects in individuals with ASD is possible due to their inherent interest in technology and mechanics. Thus, in the context of a therapeutic setting, ASD individuals can be promoted to behave in a certain way in a certain social setting. It can even encourage the autistic children to socialize more and thus, thrive in a shared environment with other people.

It does not mean that social robots alone will be used in helping autistic children. The Development of Robot-Enhanced therapy for children with Autism spectrum disorders (DREAM) and the Robot-assisted therapies (RAT) involve therapists, teachers and parents working in tandem with social robots to help make the experience better and the prognosis even better and more efficient.

CAN SOCIAL ROBOTS BE USED TO DIAGNOSE ADS?

Theoretically, it is being suggested that since a majority of the children diagnosed with ADS have shown a tendency to mime the actions of a robot, it can be used to identify or diagnose certain other symptoms of ADS or even the presence of ADS in some children. You see, the idea is that a social robot is shown to perform a certain act in front of the concerned children, which will act as a stimulus or even a social press. Then, the child would respond to this stimulus, and depending on their response, a diagnosis would be made. This is almost similar to the principles followed in Autism Diagnostic Observation Schedule (ADOS). But the major advantage in including the social robots into ADOS tests would be that they would record the behavior of all the children and also provide measurement codes or techniques, but most importantly, they would allow for a certain degree of uniformity in all ADOS tests done across the world, which in turn would help for a more even and better diagnosis.

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