Individual Assignment 1 (Robots for Special Education)

Name : Kok Yao Zhang

Matrix Number: A176818

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Subject: PENGATURCARAAN DAN SIMULASI ROBOT

How can robots be used in special education especially in helping the autistic children?

The rapid developments in Artificial Intelligence and robotic technology makes them one of the most promising technologies in this decade and the future. Researchers and Scientists has also shown their interest in the potential of social robots in education for autistic children. Researches on robotic systems for autistic children are an expanding subfield of robotics and human-robot interaction research. According to Wikipedia, autism is a developmental disease marked by social interaction and communication difficulties, as well as restricted and repetitive behaviour. Children with autism frequently felt lonely compared to other non-autistic peers, despite the common belief that autistic children wants to be left alone. As a result, robot-based programs are frequently recognized as having the potential to benefit autistic children. researchers have been researching robot-assisted therapy for autism. In the late 1990s, for example, scientists first conceived about KASPAR, a social robot. Scientists from the University of Hertfordshire in the United Kingdom are now working on it. Robokind's Milo and QTrobot are also some of the similar commercial robots for autism.

In 2013, there is a robot named Milo released by Robokind, It includes voice-activated lessons aimed at improving communicative, social, emotional, and behavioral abilities of autistic kids. Milo is able to show verbal prompts and facial cues. In these interaction, milo moves through a set of expressions, angry, sad, happy, frustrated and more. It allows autistics child to study and identify emotions. Due to milo’s effectiveness, some school chooses it as a test-driving robot for their students.

QTrobot is developed by a LuxAI. According to the company’s claim, its QTrobot can boost these children's willingness to communicate with human therapists while also reducing discomfort during therapy sessions. The cofounder of LuxAI, Aida Nazarikhorram says that when

interacting with another person, there are many social clues such as facial expressions, voice tonality, and body movement that can be overwhelming and distracting for children with autism. But QTrobot are able to makes everything simplified. For example, every time the robot says or does something, it is identical to the prior time, which provides comfort to autistic kids. In a study presented in RO-MAN(IEEE Robotics and Automation Society), 15 boys ranging in age from 4 to 14 years old took part in two interactions: one with QTrobot and the other with a single person. When compared to their focus at the human, the children directed their look onto the robot for almost twice as long on average. According to the study, repetitive behaviours like hand flapping—one of the indication of discomfort and anxiety, occurred nearly three times as often during sessions with the human as they did with the robot. It shows that a triangle interaction between the human therapist, the robot, and the child is possible with the robot, making the autistic child able to communicate with others.

Other than those two robots, there is also a therapy robot named NAO. NAO was recently used by the MIT Media Lab to test a machine learning network that can detect children's behaviour. During a therapy session, the algorithm can measure the level of interest and excitement of children with autism. The findings were published in the journal Science Robotics in June 2018.

There are still many more robots that are capable of helping autistic child in development. The future for therapy robot is bright. Therapy robots are thought to be a great companion for autistic children, potentially related to the fact that the social robots are interactive, but ultimately it was programmed always follows the rules. Although there is a common fear in society that children paired with robots might pushed them away from people and closer to technology. Studies actually shows that the robots greatly improves the interaction. We can conclude that the advancement of therapy robots really benefits the autistic child and parents. It is an effective way to facilitate social skills for children with ASD