ABSTRACT

In the area of psychosis, autism spectrum disorder (ASD) is a mental disorder included with the major deficits associated with social interaction, communication, and repetitive or stereotypical behavior. A large number of computer-assisted approaches have been developed over the last few decades to improve the lifestyle of the subject with ASD. The aim of this study is to provide a detailed review of computational advancements for ASD interventions. This chapter summarizes the basic theories in autism and also discusses the technological developments of autism in the present era. With the enrichment in technological developments, researchers and experts focused on the monitoring and improvement of the skills (social, communication, and behavioral) in individuals with autism-related disorders. In conclusion, the work presented in this chapter summarizes that the evolutionary computational interventions have a remarkable possibility for the monitoring and basic skills enhancement in ASD.
INTRODUCTION

In the area of psychosis, Autism Spectrum Disorder (ASD) is a complex and fascinating mental disorder. It included the major deficits associated with social interaction, communication, and repetitive or stereotypical behavior (Diagnostic and Statistical Manual of Mental Disorders - Fifth Edition, 2013). Throughout their life, considerable challenges are there to both the individual with autism and their family. In 1943, Dr. Leo Kanner was the first author that phrased the Autistic disorder as a distinct entity (Kanner, 1943). Since then, the dramatic increase (from 4-5 in 10000 to 1 in 59) has been recorded in Autistic cases in various geographical locations across the world (Baio et al., 2018; Bonnet-Brilhault, 2017; Loucas et al., 2008; Ratajczak, 2011). Initially, the prevalence associated with autism was in the range of 3.3 to 16 per 10,000 (Wing, 1993). The recent report presented by Autism and Developmental Disabilities Monitoring Network in America, the percentage of ASD affected children is 1 in 59 (“Data & Statistics on Autism Spectrum Disorder,” 2019). The statistics provided by the Rehabilitation Council of India (Barua & Daley, 2001) stated the prevalence rate in India can be 1 in 500 people or more than 2,160,000 people. The low awareness about autism diagnosis in India is a major cause of the low prevalence rate in India.

In the present era, computer-assisted technological research for autism has been divided into several interlinked and inter-trade chapters. Some studies were related to enhancing the knowledge of autistics, where others were dealing with autistic behavioral improvement along with its techniques. This age had highly favored for the use of advanced technological tools for supporting ASD’s such as augmented systems, sensor technologies, artificial intelligence, virtual reality, etc. The utilization of interventions for ASD has been highly recommended by the authors. The year 2011 onwards, advance and evolutionary computation dependent areas (such as software development, robotics, video modeling, internetworking, artificial intelligence, virtual reality, etc.) are now highly being used as a part of ASD intervention. As per present trends, automated environments are the first preference of researchers.

The main objective of this chapter is to present the technology-wise computer-assisted developments from the early stages of computer technology in evolutionary computational development. During this era, internet-connected systems; intelligent systems and robotic systems have been playing a vital role in the communication and behavior improvement of ASD’s. This chapter is organized into different sections based on the types of computer-assistive technologies. In the initial sections, a detailed explanation about autism and its behavioral issues has discussed. Then the role of computer-assisted technologies has presented in proceeding section. Further sections are detailing for computer-assisted interventions starting from the initial understanding till the presently using evolutionary computer-assisted interventions.
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