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The Application of AI in Developing Assistive Technologies for Non-Verbal Individuals with Autism

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Abstract : Autism Spectrum Disorder (ASD) often presents significant communication challenges, particularly for non-verbal individuals who struggle to express their needs and emotions effectively. Assistive technologies (AT) have emerged as vital tools in enhancing communication abilities for this population. Recent advancements in artificial intelligence (AI) hold the potential to revolutionize the design and functionality of these technologies. This study explores the application of AI in developing intelligent, adaptive, and user-centered assistive technologies for non-verbal individuals with autism. Through a review of current AI-driven tools, including speech-generating devices, predictive text systems, and emotion-recognition software, this research investigates how AI can bridge communication gaps, improve engagement, and support independence. Machine learning algorithms, natural language processing (NLP), and facial recognition technologies are examined as core components in creating more personalized and responsive communication aids. The study also discusses the challenges and ethical considerations involved in deploying AI-based AT, such as data privacy and the risk of over-reliance on technology. Findings suggest that integrating AI into assistive technologies can significantly enhance the quality of life for non-verbal individuals with autism, providing them with greater opportunities for social interaction and participation in daily activities. However, continued research and development are needed to ensure these technologies are accessible, affordable, and culturally sensitive.

Keywords : artificial intelligence, autism spectrum disorder, non-verbal communication, machine learning
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