

Enhancing Human-Computer Interaction: A Survey on Intelligent Virtual Assistants for Accessibility and Contextual Awareness

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Abstract: *The evolution of Intelligent Virtual Assistants (IVAs) is transforming human-computer interaction, with applications extending across accessibility, hands-free operations, and user-adaptive functionalities. This paper surveys the development of IVAs focusing on their role in enhancing accessibility for diverse user groups, especially the visually and hearing impaired. Key technological advancements are examined, including Natural Language Processing (NLP), multimodal sensory integration, and adaptive learning mechanisms. This survey identifies critical challenges such as the need for improved real-time processing, context awareness, and enhanced personalization, presenting the latest methodologies and frameworks that address these gaps. Future directions for IVA development are proposed to improve accuracy, context integration, and accessibility.*

Keywords: Intelligent Virtual Assistants (IVAs), Accessibility in IVAs, Real-Time Responses, Context-Aware Systems, Natural Language Processing (NLP), IVA Functionality Enhancement, Assistive Technology, Contextual Awareness, Advanced User Interaction