

A Review Paper on Voice recognition and response (VRR)

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Abstract:

Voice recognition and response technology have undergone significant advancements, revolutionizing various domains such as personal assistants, smart homes, and customer service applications. This review study provides an extensive analysis of voice recognition and response, covering its historical development, evolution, current state, research trends, AI models, used case studies, applications, challenges, and future directions. By scrutinizing the progress in this field, the study aims to gain insights into the potential, limitations, and opportunities of voice-based interaction systems.

The introduction of voice recognition and response has transformed human-computer interaction by enabling machines to comprehend and respond to human speech. This study explores the historical development of voice recognition, tracing its evolution from early rule-based approaches to statistical modeling techniques like Hidden Markov Models (HMMs). The journey of voice recognition systems is elucidated, emphasizing breakthroughs in deep learning and the integration of artificial intelligence (AI) models.

Despite remarkable advancements, voice recognition and response systems face challenges such as ambient noise, speaker variability, and language nuances. Recent techniques, including attention mechanisms, transfer learning, and reinforcement learning, have been employed to address these challenges and enhance the robustness of systems. This study aims to shed light on

the obstacles encountered by voice recognition technology and propose objectives for overcoming them.

Current advancements in voice recognition and response technology have led to the widespread adoption of voice assistants like Amazon's Alexa, Apple's Siri, Google Assistant, and Microsoft's Cortana. These intelligent voice assistants leverage natural language processing (NLP) and machine learning algorithms to provide personalized and context-aware responses. The practical applications of voice recognition and response in healthcare, automotive, education, and customer service industries are examined, showcasing how these systems enhance user experiences and enable hands-free operation.

In recent years, research has focused on developing end-to-end models using recurrent neural networks (RNNs), convolutional neural networks (CNNs), and transformer models. These AI models have demonstrated promising results in improving speech recognition accuracy and language understanding. By addressing the challenges faced by current systems, this study aims to contribute to the refinement of voice recognition and response systems and foster further advancements in the field.

Keywords: Voice recognition, AI models, Deep learning, Natural language processing, Reinforcement learning, Machine learning, Recurrent neural networks, Convolutional neural networks


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