SpeakYourMind: Empowering Social Connection for Nonverbal Autism Through Personalized AI-AAC and Community Sharing

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Nonverbal autistic individuals depend on Augmentative and Alternative Communication (AAC) systems, yet existing tools limit expressive flexibility and require time-consuming card navigation. This study proposes an AI-based AAC system that analyzes conversational context to recommend appropriate AAC cards in real time and automatically generate new cards. The system integrates a large language model with semantic similarity filtering, image generation, and text-to-speech technologies. Beyond individual use, the system fosters a collaborative ecosystem where users can share their created AAC cards within an autism community. This collective sharing mechanism not only enhances social connectivity among users but also accelerates the personalization of the AAC tool. Experimental results show a recommendation accuracy of 82% and demonstrate a significant improvement in communication: average conversation time was reduced by approximately 44%, while the variety of expressive cards used increased by a factor of 2.13 compared to systems without AI features. These findings indicate that by bridging personalized AI with community-driven social interaction, this system can effectively support free and inclusive communication for nonverbal autistic individuals.

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