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Lip Reading Using Machine Learning

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Abstract: *This Lip reading, also known as visual speech recognition, is a technology that interprets spoken words by analyzing the visible movements of the lips, tongue, and facial muscles. This project develops an intelligent lip reading system using advanced machine learning techniques to convert visual speech patterns into text. The system processes video input frame-by-frame, employing computer vision algorithms to detect and track lip movements with high precision. Deep learning models then analyze these visual features to predict spoken words or phrases. This technology has significant applications in assistive communication devices, security systems, and human-computer interfaces, particularly in environments where audio is unavailable or unreliable. The system includes adaptive algorithms that personalize recognition based on individual speaking patterns, improving accuracy for regular users. Privacy-preserving techniques ensure secure processing of video data, with options for edge computing deployment. Future enhancements will focus on multilingual support, low-light performance optimization, and integration with augmented reality platforms. This work contributes to the growing field of visual speech technology, offering solutions that enhance accessibility for the hearing-impaired while creating new possibilities for silent communication in various professional and personal contexts. The project demonstrates how machine learning can bridge sensory gaps, creating more inclusive communication technologies for diverse user needs.*

Keywords: Artificial Intelligence, Machine Learning, Computer Vision, Speech Recognition, Motion Analysis, CNN

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