


Chapter 15

An Interactive Sign Language Translator

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ABSTRACT

The chapter proposes a system that offers a groundbreaking solution to translate sign language into text and speech. This is achieved by implementing a Convolutional Neural Network (CNN) that effectively recognizes hand gestures from images. The process begins with detecting and processing hand movements from the webcam image using the Mediapipe library. Subsequently, the interpreted data is passed through a classifier to predict hand movements accurately. The resulting model has the potential to significantly bridge the communication gap between Deaf/Dumb individuals and the general hearing population. By enabling more effective expression and understanding of sign language, this innovative system prioritizes the perspective and preferences of the patient, bolstering inclusive communication practices.

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INTRODUCTION

Understanding and recognizing the importance of sign language in bridging communication gaps for individuals with speech or hearing impairments is crucial. Sign language serves as the primary means of communication for these individuals, granting them access to employment, education, and social interaction. Emerging technologies like Artificial Intelligence(AI) and Blockchain is playing a crucial role in Healthcare 4.0 (Rai et al., 2022). Researchers are using these technologies to develop solutions for the issues faced by practitioners and patients in different ways (Rai et al., 2023; Rai et al., 2024).

Sign language plays a crucial role in population management by ensuring effective communication with individuals who are deaf or hard of hearing. Access to sign language can help provide vital information, education, and services to a significant portion of the population that uses sign language as their primary mode of communication. Additionally, incorporating sign language in educational and public service settings contributes to inclusivity and equality, ultimately benefiting the population. Recognizing and supporting sign language usage can lead to improved access to resources and opportunities for deaf individuals, thereby positively impacting population management.

Sign language is also closely related to patient-centered care as it ensures effective communication and understanding between healthcare providers and patients who are deaf or hard of hearing. By utilizing sign language, healthcare professionals can directly engage with patients and effectively convey important medical information, treatment plans, and emotional support, thus fostering a more inclusive and patient-centered approach to care. Access to sign language interpretation services also helps address the specific needs and preferences of deaf patients, allowing them to participate fully in healthcare decision-making and access quality medical care. In this way, sign language is vital in promoting patient-centered care by ensuring that individuals with hearing disabilities receive comprehensive and equitable healthcare services.

Finally, sign language can be related to pharmacogenomics in the context of ensuring equitable access to information about medication and its effects for individuals who are deaf or hard of hearing. By providing sign language interpretation services for discussions and materials related to pharmacogenomics, healthcare professionals can ensure that deaf patients can access crucial information about how genetic factors can influence their response to medications. This approach promotes inclusivity and ensures that all patients, regardless of their hearing abilities, can fully understand and participate in discussions about personalized medicine and the potential impact of genetic variations on their medication management. By incorporating sign lan-

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