American Sign Language Education in the Virtual Reality Environment for Deaf Communities
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Abstract
The COVID-19 pandemic has changed the way we learn and receive an education. One of the unique challenges that people with hearing impairments have faced during the pandemic is communication in remote education environments. The current learning virtual reality platforms do not provide user-friendly support systems such as American Sign Language (ASL) and唇读 (Lip Reading). The Lip Reading (LR) system is one of the few systems that can help in improving the learning methodology among people with hearing or speech disabilities. We developed a prototype known as a 'visual ASL reader' which can be used to identify and segment gestures into American Sign Language (ASL) letters. This tool can be used to improve the communication process for deaf people on a learning VR platform.

Metholodology
The COVID-19 pandemic has challenged the way people with hearing impairment learn in the remote learning environment.

Background
- Deafness is one of the main parts of human communication and becomes more and more important in recent years.
- E-learning platforms enable us to learn while using the Web as a learning environment. These enable learners to learn at their own pace and time, and by itself does not solve the issue of enhancing inclusion for students regardless of their sensory abilities.
- Virtual Reality is fast becoming another tool that can be added to the learning environments. In the area of visualization, it offers the ability to be placed in environments, both virtual and physical, which can increase the sense of presence.

Approach
- The proposed system consists of a Convolutional Neural Network (CNN) architecture to design the sign language interpreter.
- The system proped uses a technique in decoding the alphabet and translating it into words or sentences.

Development
- Developed a model that can help society in a broader way by bridging the communication gap between Deaf-Deaf people and everyone else.
- We propose a system using an interface between the Deaf-Mute community and non-deaf people based on American Sign Language (ASL).

Conclusion
We have designed and created a virtual world where individuals can learn ASL in a virtual environment that uses signification methods.

References

Acknowledgments
- City University of New York (CUNY)
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- Computer Information Systems Department (CIS)
- Mentor: Dr. Mohammad Azhar