GESTURE RECOGNITION-BASED DEVICE CONTROL

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University of Dublin, Trinity College, 2024

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Hand gestures is one of the primary modes of communication after speech and is the key medium of communication employed by the people who are speech or hearing impaired. It acts as a gateway for their interaction with the world. Smart devices offer convenience and efficiency, yet traditional control methods for these smart devices like voice control still present barriers for individuals with disabilities. In this ever-evolving landscape, making the technology more inclusive and accessible to these diverse user groups remains paramount.

This project aims to contribute to this initiative by exploring the development and implementation of a vision-based control system that recognises hand gestures for the purpose of controlling various smart home devices that people use in their day-to-day life. The architecture of the system uses OpenCV to capture the camera feed and Google's Mediapipe for hand key points extraction. It then uses this key-point data compiled and processed to a Numpy array to train an LSTM neural network model which recognises the gestures. Upon recognising the gesture, the model finds the corresponding command according to the user's input and sends the command to the smart device via the local network connection.

This endeavour will contribute to the broader goal of enhancing accessibility of today's technology and bridge the gap between the people who rely on gesture as their primary mode of communication and the technology they daily rely upon. The focus of this study is to enhance the accessibility of the smart devices that are very prominent in modern day homes where most of the traditional appliances like TVs, refrigerators, air conditioning units, speakers, kitchen appliances like coffee makers and toasters are now being replaced by their smart counterparts which can be easily controlled via smartphones or other device control mechanism.