



Sign Language Learning Application for Deaf and Dumb People

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Abstract - *The creation and testing of a Sign Language Learning Application to improve accessibility and inclusion for anyone interested in learning sign language. The app's goal is to provide a simple, engaging, and comprehensive platform for effective communication and understanding between the deaf and hearing communities. The paper highlights the app's primary features, development process, and user-centric evaluation, highlighting its potential influence on boosting sign language skill and establishing a more inclusive society. The findings imply that the Sign Language Learning App has the potential to alleviate communication barriers experienced by people with hearing impairments and promote inclusiveness. Users particularly liked the app's user-centric design, interactive learning modules, and real-time feedback mechanisms. The deaf community's criticism highlighted the significance of proper sign language representation, cultural sensitivity, and continued collaboration with sign language experts. The Sign Language Learning App is a promising tool for anybody interested in learning sign language, and it strives to make society more inclusive by breaking down communication barriers between the deaf and hearing communities.*

KeyWords: Accessibility, Communication, Deaf Community, User Interface.

1. INTRODUCTION

Sign language is a vital means of communication utilized by deaf populations all over the world. It is a visual language that uses hand gestures, facial expressions, and body motions to transmit meaning. However, a lack of extensive sign language knowledge and resources frequently poses impediments to efficient communication between deaf people and the hearing population. The Sign Language Learning Application research study goes into the creation and impact of a mobile application aimed to aid in the learning of sign language. The study paper goes into the application's design and execution, accentuating essential features and functionalities that lead to an engaging and accessible learning experience. The Sign Language Learning Application study paper looks into the creation and impact of a mobile application designed to aid with sign language learning. This study aims to increase our understanding of how technology can be used to bridge communication gaps and empower individuals to learn sign language by investigating its features, usability, and

efficacy. The technique for the study includes both quantitative and qualitative approaches. User feedback is used to evaluate the app's usability and user happiness.

2. Body of Paper

2.1 Literature Survey

1 In Sign Language Recognition For Deaf And Dumb People Using Android Environment research paper highlights the primary means of communication for deaf and mute persons. Sign language, as opposed to gestures, is a language that expresses meaning through body movements and facial emotions. The general public is unfamiliar with sign language. Sign language is a fairly widespread way of communication for deaf people (including aphasia, deaf and mute, and others), bringing work prospects, learning chances, and other characteristics of the deaf.

Human-computer interaction research approaches primarily include sign language recognition and sign language learning. Multiple sensors are employed for data transmission based on data gloves to achieve sign language recognition.

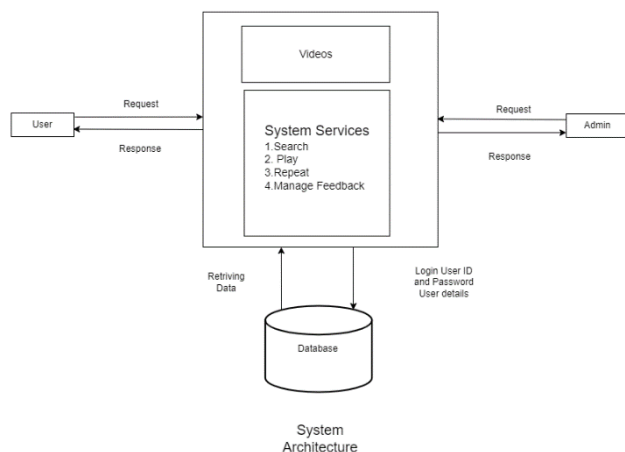
2 In Indian Sign Language (ISL) is a sign language used by people who are deaf or hard of hearing to communicate with others. As a result, there is a communication gap between individuals who understand ISL and those who do not. It is made up of an Android smartphone camera that captures hand positions and gestures, as well as a server that processes the frames received from the smartphone camera. The system's goal is to implement a rapid and accurate recognition approach. The technique proposed in this study correctly classifies all 33 ISL hand positions. It can be concluded that the system proposed in this study accurately tracks the sign demonstrator's hand motions by employing techniques such as object stabilization, face elimination, skin color, extraction, and hand extraction. The system outperforms previous systems reported in the literature in terms of accuracy and speed of recognition of sign language. This method is generic and can be applied to different single- and two-handed gestures. If a dataset meeting the system's current requirements is available, the system outlined in this research can be extended to other Sign Languages.

3. In the Glove Based Deaf-Dumb Sign Language Interpreter paper, Sign Language However, because most others do not understand or find it difficult to comprehend their sign language, it creates a barrier between them. To reduce barriers, this technology converts gestures to text and sounds. There are two major approaches to gesture recognition: vision-based approaches and sensor-based approaches. The vision-based approach gathers images of gestures from the camera, obtains the necessary data, and recognizes it. The sensor-based technique collects data from numerous sensors and analyses, recognizes, and interprets it. The main advantage of this strategy is its portability. In comparison to the existing system, the proposed system is more compact, more likely to be moved to any area, and better passes diverse signals.

4 In Research on Communication APP for Deaf and Mute People Based on Face Emotion Recognition

Technology Hearing loss in deaf people of varying degrees causes discomfort in their daily communication and communication. At the same time, hearing loss may impair their capacity to recognize facial emotions, limiting their interpersonal communication even more. A wearable portable face emotion recognition + sign language translation system is created in this paper. This system collects action data using sensors, recognizes sign language actions in real time using a pre-trained network, and calculates using a built-in microprocessor. Finally, the outcomes are shared using the communication module. Transfer to the display of a mobile phone

2.2 Architectural Design



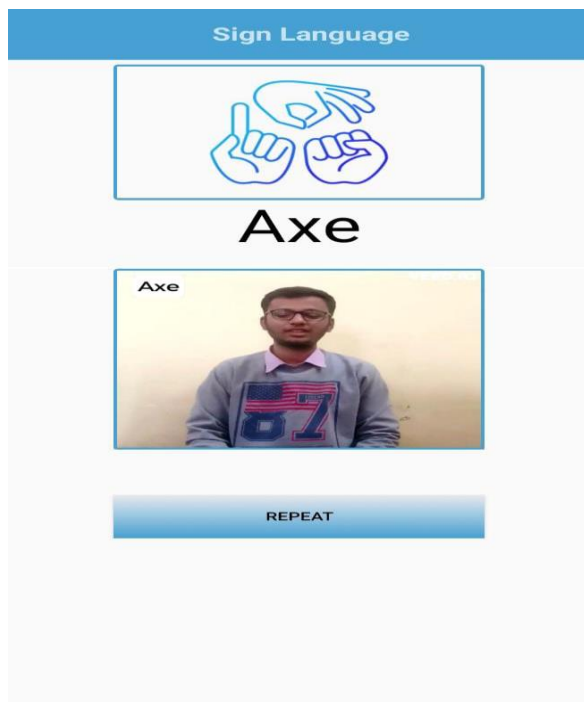
This application will be available to the users in the form of an Android application. Modules involved in this Reading System are as follows:

1. Lesson Exploration: Users can navigate through the sign language learning app to learn about the many classes and subjects accessible. Each lesson includes educational content such as videos, photos, and textual descriptions to teach the user various sign language

gestures. Users can progress through the lessons at their own pace, watching and analyzing the instructional materials. Observation of Gestures.

2. Users can watch pre-recorded sign language films or animations that demonstrate various movements. The program includes a library of sign language motions organized by topic, allowing users to view and study how each gesture should be performed. Users can study and understand the movements and expressions connected with each gesture by pausing, rewinding, and replaying the films.
3. Feedback and Guidance: After watching the motions, users can obtain feedback and guidance on their understanding and execution of sign language. The app may provide descriptive feedback on the precision of handshapes, movements, facial expressions, and general fluency. Users can analyze the feedback and make changes to their own method, concentrating on improving their execution based on the supplied recommendations.
4. User Registration and Authentication: Users can create an account by entering required information such as a username, email address, and password. The application validates the user's credentials and authenticates their access to the learning resources.
5. Lesson Selection and Viewing: From a categorized list, users can explore and pick specific sign language lessons. Each lesson includes educational content such as videos, graphics, and text summaries. Users can study and interpret the sign language movements offered in the lesson materials at their own pace.
6. Gesture Library: The application includes a vast library of sign language gestures arranged by topics or alphabets. Users can search for specific gestures and get detailed information about each gesture, such as its meaning, proper execution, and related variations.
7. Gesture Videos and Descriptions: Users can view pre-recorded videos of sign language gestures being performed. Close-up views of hand gestures, facial expressions, and body language are included in the videos, providing visual advice.
8. User Community: Users can participate in a community forum where they can connect, ask questions, and discuss their experiences with learning sign language.

2.4 Outcomes



4. To examine the impact of incorporating video tutorials within the sign language learning application on user engagement and learning outcomes.
5. Highlight the key features and functionalities of the app, emphasizing its user-centric design and interactive learning video material.
6. Discuss the evaluation methodology employed to assess the effectiveness of the app, including user feedback.
7. To compare the learning outcomes of users who have utilized the sign language learning application with those who have used traditional methods of sign language education, assessing the application's efficiency as a learning application.
8. Present the findings from the evaluation, such as user satisfaction, improvements in sign language comprehension, and increased confidence in communicating with the deaf community.

2.6 Working

The Sign Language Learning Application is designed to provide an interactive and user-friendly platform for individuals to learn and communicate using sign language. Here is an overview of how the application typically works:

1. **User Registration:** Users begin by registering an account on the application, providing their basic information. This step enables personalized learning experiences and feedback.
2. **User Login:** User can login in the system using their login credentials like email and password. After login into the system they can use the application.
3. **User Interface:** The application offers a visually appealing and intuitive user interface. Users can navigate through different sections, such as learn, Feedback, Profile.
4. **Lessons and Tutorials:** The application provides a variety of video tutorials and lessons that teach sign language. These lessons cover different topics, including Alphabets, Numbers, Colors, Days, Nature, Body parts.
5. **Profile:** The user can view his information in the profile module.
6. **Feedback:** The user can give feedback about the system or application and admin can give feedback answer to the user via admin application. The application undergoes regular updates to improve content, functionality and user experience. User feedback and suggestions play crucial roles in updates.

2.4 Future Scope

Education and Learning: Deaf people can use ISL applications to help them access educational resources and information. For deaf students, this means more interactive courses, tutorials, and exams that are inclusive of them.

Accessible Education: ISL learning programmes can offer both hearing people and people who are hard of hearing access to a quality education. These programmes allow users to study the language at their own pace by providing interactive lessons, tutorials, tests, and evaluations in ISL.

With the growing popularity of smartphones and tablets, mobile learning possibilities can be provided by ISL learning programmes, enabling users to learn ISL whenever and wherever they want. These apps provide sign language movies in categories including colors, numbers, alphabets, and more.

2.5 Methodology

Goals and Objectives:

Enable individuals, including those with hearing impairments, to learn sign language and effectively communicate with deaf or hard-of-hearing individuals. Inspire further research and innovation in the field of sign language learning apps, with the ultimate goal of creating a more inclusive society where communication barriers are effectively overcome.

1. **Provide Accessible Learning Resources:** Develop a user-friendly application that offers easily accessible sign language learning materials including videos of categories like colors, food, numbers, alphabets etc.
2. To assess the effectiveness of the sign language learning application in facilitating the acquisition of sign language skills among users.
3. To evaluate the usability and user satisfaction of the sign language learning application, considering factors such as user interface, interactivity, and accessibility.

CONCLUSION

In conclusion, the Sign Language Learning Application project is a significant and valuable initiative that aims to bridge the communication gap between the hearing and deaf communities. Through the development of a user-friendly mobile application, individuals can easily learn and communicate using sign language, empowering both deaf individuals and those who interact with them. It also will benefit the deaf and dumb people to learn the Indian sign language from the basics. The project's primary objective was to create an accessible and interactive platform that fosters inclusivity and equal opportunities for communication. By leveraging technology, the Sign Language Learning

Application offers a convenient and flexible way for users to learn sign language at their own pace and convenience. Throughout the project, various features were implemented to enhance the learning experience. User feedback and engagement were key considerations throughout the development process. Regular updates and improvements were made based on user suggestions and emerging trends in sign language education. In summary, the Sign Language Learning Application project successfully addresses the need for accessible and comprehensive sign language education. By utilizing technology and incorporating user feedback, the application provides an empowering tool for individuals to learn and communicate using sign language.

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