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Digital Sign Language App for Deaf Children

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***Abstract*: India has the highest numbers of hearing-impaired people in the entire world, numbering 18 million. In which Only 0.25 % of these peoples currently have privilege to bilingual education where knowledge of sign language is primary and that of a local language. Building an Application that will not only help the entire deaf community, but also their interpreters, families, and educators to learn and recognize sign language, will go a long way to facilitate easier conversations and exchange of ideas, thereby enabling a more inclusive society.**

***Keywords*: application, Java, sign language, XML.**

1. Introduction

A sign language is a language which, uses manual communication and body language to convey meaning This involves simultaneously combining hand shapes, movement of the hands, arms or body, and facial expressions to express a speaker's thoughts Unlike gestures, sign language is like speech and is used instead of speaking, whereas gestures are mostly used while speaking.

Importance of sign language:

- Have the right to exercise their civil as well as linguistic-cultural rights.
- Have the right to pursue studies/education in sign-language.
- Have the right to contribute in decision making.
- Have the right to equal and, full access to information as well as accessible communication and orientation.
- Have the right to assert/represent themselves in sign-language and utilize the right to vote.
- Have the right to use sign-language in all areas of life

2. Problem Statement

A. Experiential Shortages

Research shows that deaf students often lag behind their hearing peers when it comes to number concepts, language and problem solving skills. Hearing students constantly absorb new information and knowledge through the daily noises, conversations and language that is spoken around them. Deaf and hard-of-hearing students do not have that luxury. Teachers can bridge this gap by being flexible in the way that they respond to the educational concerns of their deaf students

B. Lip-Reading/Residual Hearing

Teachers often hypothesize that their deaf students are capable of lip-reading – which can be true – but it is essential to keep in mind that only 30-40% of spoken English is distinguishable on the lips. Students who rely on lip-reading often perform better when it is a subject that is familiar. When lecturing students, teachers should consistently face their deaf students, never talk when handing out papers, pause before heading into a new subject and give the deaf student applicable time to process the preceding subject's information in case he/she has any question.

C. Social Concerns

Children who are deaf often tend to feel uncomfortable in the classroom when drawing attention to their hearing problem. They want to be like their friends with 'normal' hearing, so this drives them to mainly keep to themselves and prefer to not take part in classroom activities

3. Aim and Objective

The aims and objectives of the Association shall be:

1. To have a common acceptable sign language in Country.
2. To promote the profession of sign language interpretation
3. in Country.
4. To facilitate the integrating of Deaf into the society
5. Working in partnership with NNAD on interpreting issues.
6. To solicit with the Deaf in the area of Advocacy.
7. To build a trust relationship between Deaf.

4. Proposed System

The system, will help user especially students of SLD learn and master sign language at their paces through improvisation. It will help them learn sign language and ease communication with deaf-dumb persons. It will help them to learn at their pace anytime and anywhere. The apps provides platform to learn alphabets, letters in sign language, common words from sign language to English. This will reduce drastically the difficulties in learning sign language thereby building user confidence.

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Advantages of Proposed System:

1. Normal Person can communicate directly with Deaf Blind, Deaf, and Hearing-Mute friends, clients, and strangers.
2. Normal Person can communicate effortlessly in extremely noisy situations (concerts, loud restaurants) and situations that require silence (libraries, hearing person in the room sleeping).
3. Normal Person can describe environmental information much more efficiently and with far more detail, especially using Pro-Tactile. Normal Person can also receive much richer descriptions, especially of images or videos. They can have gained awareness of aspects of the visual world that Person otherwise never would have.
4. Normal Person can retain information better when Normal Person repeat it to himself in SL because the kinesthetic aspect helps it stick in my memory. It has the same effect as silently taking notes when Normal Person don't have a braille display on hand.
5. Normal Person can experience the full effect of body language and how it contours language. I get a very vivid sense of the person's personality and mood based on the nuances of how they sign. The impact is more profound than hearing all that information in someone's voice. I access more subconscious information. I also learn how I can emulate my own body language with more detail.
6. SL significantly improved Normal Person mental mapping skills. My orientation and mobility skills sky-rocketed when Normal Person learned SL, and later, PTSL

5. Architecture

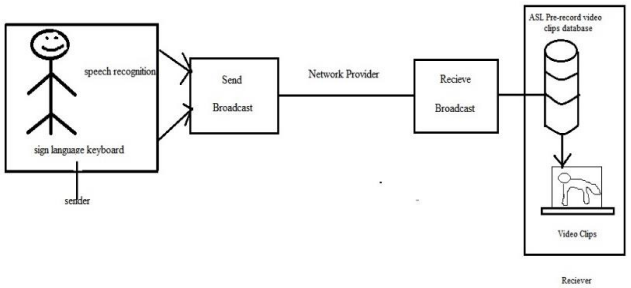

Fig. 1. Architecture

This is an overview of the architecture:

1. Deaf person signs through the sign language keyboard displayed in an application as shown in figure.
2. Software translates signs into text and ASL video through interpretation process.
3. The hearing person read it or view the sign language video extracted through hand speak.
4. Software translates text and ASL video interpreted through JSON (Java Script Object Notation).
5. The deaf person reads it and sees ASL video.

6. System Requirement

1. Operating system: Android 4.2, Android 4.4.2, or Android 4.4.4
2. Processor: Intel Atom® Processor Z2520 1.2 GHz, or faster processor.
3. Storage: Between 850 MB and 1.2 GB, depending on the language version. RAM should be Minimum of 512 MB; 2 GB is recommended.
4. Hard Disk: 2 GB of available hard-disk space for installation; extra free space is required during installation. You cannot install using a removable flash storage device.
5. Video: 1280 x 800 pixels or higher on a 10-inch device
6. Browser/Internet: This application is designed to work offline. To download and launch Google Play* Store apps within the application, a high-speed Internet connection is recommended.
7. API level: Minimum android version supported, its mostly known by the developer. There have been many major changes between API's in android. support v4 and v7-compat libraries do help a lot, but they don't cover all aspects.
8. Device capabilities: Note down all the features your app uses. (like has touch screen, has camera, accelerometer, network connectivity etc.). Luckily, you can declare that in App manifest (uses-feature) and play store will filter out unsupported devices.
9. Disk: Estimate the size of the app after installation, note that the minimum disk requirement for App is the space required to store the app itself, so that it can at least start, and does not include caches, databases or the user content it creates on usage.
10. Display Size: While a responsive and flexible UI is always recommended, your app may be only usable with certain screen sizes. So, compatible screen sizes can be taken into account.

7. Conclusion

As described in this paper, the use of SL. furthers the reading competence of deaf people and enhances their acceptance and understanding of learning content presented to them. But most of the deaf adults did not get school education in sign language and therefore lack basic reading and mathematical skills needed for further vocational training. The low reading skills also restrict their possibilities of information gathering and self-directed learning. Based on these findings, a dictionary and e-learning system is adapted to the needs of deaf People. The use of sign language animation for each text block is the most important feature. Providing sign language animation will help the users improve their reading skills and enable them to learn more independently. Also E-learning system for deaf adults has been proposed.

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