Collage of computers and information technology

Qudra

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Abstract

Physical disability has a big impact on daily life, for example, people with hearing impairment. This disability could cause difficulty to communicate with normal people. Also, it considers a big barrier to easily communicating with hearing impairment. In general, a lack of daily communication should not be a big barrier to socializing, job, education, or productivity. It is worth noting that, for the hearing-impaired, it's hard for them to communicate with others. Also, for normal people is very difficult to learn sign language for communication. Therefore, Artificial intelligence (AI) technologies have the ability to significantly contribute to social integration by breaking down communication barriers between hearing-impaired people and the community. Recently, advancements in sensing technology and AI algorithms have committed to creating a variety of apps to help the hearing-impaired.

Objectives

In this project, we aim to achieve the following objectives:

- Helping deaf-mute people to communicate with society.
- Helping the community to communicate with the deaf-mute.
- Helping the deaf-mute in practical and educational life.
- People with impairment do not need anyone to help them.
- Applying deep learning algorithm (CNN) to get the best accuracy result.

Development tools

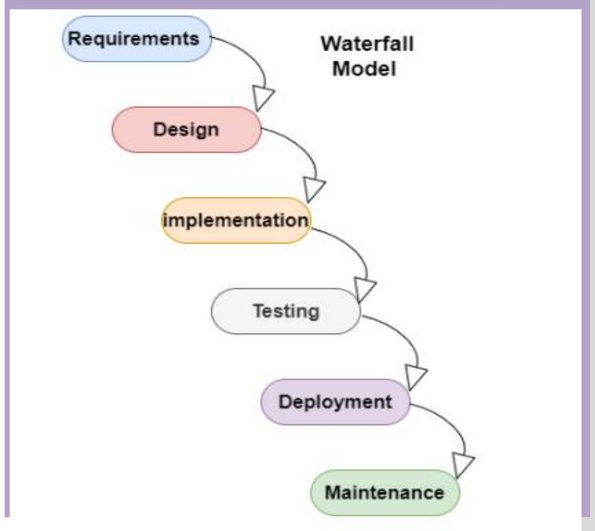
python

Firebase

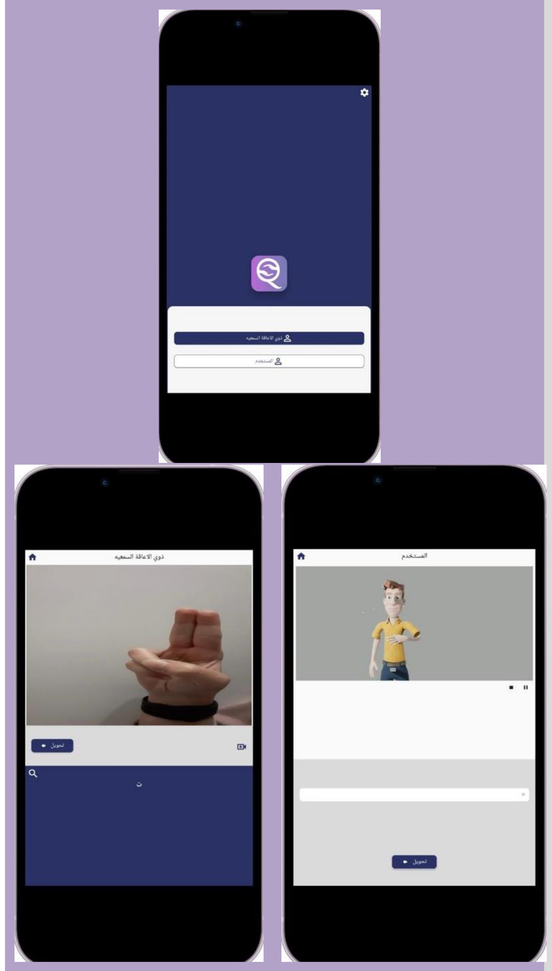
Related work

In order to make the suggested system more distinctive and efficient, it is crucial to compare it to other systems. To know if the application help hearing-impaired people, or no.

Methodology



interfaces



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Conclusion

Qudra application is android app. It supports the hearing impaired to make their daily lives easier. We spent a lot of time and work achieving our goal. We presented the Qudra app with all properties and features that support our goal and show the appropriate form as we see now. The main components that made the Qudra app appear in a suitable way are as follows:

1. Using a programming language for example we used python for a backend and flutter for a frontend and also used a firebase for the database.
2. Using a real dataset.
3. Utilizing deep learning algorithm e.g. we used CNN algorithm.
4. Evaluating our algorithm using the confusion matrix.
5. Getting the best result for the algorithm accuracy.
6. Achieving our main goal of the Qudra app is helping the hearing impaired.

Deep learning and artificial intelligence play a major role in building the Qudra app. We used Arabic Alphabets Sign Language Dataset (ArASL)2018. It consists of 54,049 images of ArSL alphabets performed by more than 40 people for 32 standard Arabic signs and alphabets. We utilized the CNN model where this model is especially useful for finding patterns in images to recognize objects, classes, and categories. Applying CNN model with parameters on 5 and 8 layers. We have already three fully connected layers on 8 layers. However, we got the same result of accuracy for 5 and 8 layers which are 0.98.

future work

The application will be expanded and developed. Although the application has achieved the goal of helping the hearing impaired to communicate with the community, it needs to add some improvements in the future:

- Upgrading the operating system to include the IOS version.
- Increasing the number of words in sign language.
- Supporting the voice feature.
- Making this app to support the visually impaired.

Finally, the Qudra application has achieved the goal of helping the hearing impaired communicate with the community.

The Qudra application is a new future in Arabic applications for the hearing impaired.