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**Ain Shams University**  
**Faculty of Computer & Information Sciences**

**Computer Science Department**



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**July 2024**

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**Arabic Sign Language Recognition**

**((وَصْل**

# Acknowledgement

All praise and thanks to ALLAH, who provided us with the ability to complete this work. We hope to accept this work from us.

To our supervisors: Dr. Mohamed Mabrouk and TA. Dr. Mohamed Ali, we are so grateful to you. All your help and support are really appreciated, thank you so much for your constant support and guidance.

Finally, we would like to thank our families, friends and all people who gave us support and encouragement.

# Abstract

The abstract is a one page summary of the whole project including: why the project is needed, what are the main features of the project and what are the final results obtained by the developed system.

It’s the most important page in the whole documentation, it should be the last thing you write.

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When adding a figure, right click on the image -> insert caption.

After you finish the document, write click on the table and choose update field, then update entire table.



**Figure 1- Neural Network general architecture**

Add list of Tables if you have tables in your text

# List of Abbreviations

|  |  |  |
| --- | --- | --- |
| Abbreviation | What the abbreviation stands for |  |
|  |  |  |
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Note: Any abbreviations used throughout the document should be included here. The list should be sorted **alphabetically**.

# Chapter One :Introduction

## **1.1 Motivation**

Language and the ability to communicate are basic rights. Being able to interact with each other means engagement, empowerment and the ability to access more opportunities. For this reason, accessibility is no longer a secondary issue.

So, sign language translation apps were created. Sign language translation apps are developed to bridge the communication gap between deaf and dump people and those who do not understand sign language.

By using sign language translation applications, these individuals can communicate more effectively with people who do not understand sign language, thereby promoting accessibility. This makes communication with deaf and dumb people easy.

These applications can convert spoken or written language into sign language, allowing individuals to understand and respond to conversations or other forms of communication. Overall, sign language translation applications play a crucial role in facilitating communication and inclusivity for individuals who use sign language.

## **1.2 Problem Definition**

In a world that is becoming increasingly interconnected through communication, ensuring accessibility and inclusivity is paramount. However, individuals who rely on sign language as their primary mode of communication face significant challenges in accessing information and participating fully in various aspects of life.

Sign language, with its intricate combination of gestures, expressions, and movements, is a crucial means of communication for the deaf and hard of hearing community. Yet, a critical barrier exists in translating sign language into spoken language, particularly into Arabic, limiting the effective exchange of ideas and information.

The primary issue we aim to address is the lack of resources and tools available for converting sign language sentences into Arabic, hindering meaningful communication between sign language users and the wider Arabic-speaking community. This gap in accessibility adversely affects education, employment, social integration, and overall quality of life for individuals who rely on sign language.

## **1.3 Objective**

1. **Arabic Sign Language Recognition:** Aims to reduce the communication gap between deaf and hard of hearing individuals by combining community knowledge with academic and industry expertise to develop a service focused on interpretation between sign and oral language.
2. **Developing a Sign Language Translation System:** The project aims to create a system that converts sign language into spoken words and phrases, facilitating communication for those with verbal communication difficulties.
3. **Improving Communication and Interaction:** By translating sign language into words and phrases, the project enhances communication between sign language users and those who rely on verbal communication.
4. **Mission for Inclusiveness:** The Arabic Sign Language Recognition project aims to increase inclusiveness with accessible, easy-to-use translation services powered by advanced AI.
5. **Providing Learning and Training Tools:** The project seeks to develop resources for learning and practicing sign language, including lessons, courses, and apps.
6. **Increasing Awareness and Understanding:** The project promotes awareness and understanding of sign language, fostering respect, solidarity, and community engagement.
7. **Support and Assistance:** The project aims to provide support to non-sign language users through its application.

By achieving these objectives, we aim to create a reliable and user-friendly tool that can facilitate communication between deaf or hard-of-hearing individuals who use ARSL and non-signing individuals in a variety of settings. We believe that this project has the potential to make a significant impact on the lives of the deaf and hard-of-hearing communities in The Arab World, and we are committed to seeing it through to completion.

## **1.4 Time Plan**

A diagram of a project

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## **1.5 Document Organization**

Include a paragraph for each chapter describing what was discussed in this chapter starting with chapter 2.

# Chapter Two :Background

This chapter should introduce the following:

* A detailed description of the field of the project.
* All the scientific background related to the project.
* A survey of the work done in the field.
* Description of existing similar systems.
* Description of any technology used: Bluetooth, GPS… etc.

# Analysis and Design

## 3.1 System Overview

### 3.1.1 System Architecture

Include a figure of the system architecture and a description of all modules.

You may add Functional and non-functional requirements section –If needed–

### 3.1.2 System Users

1. *Intended Users:*

To whom the system is built, and how each group of users will use the system.

1. *User Characteristics*

What kind of experience or skills are required from the users to be able to operate the project effectively.

## 3.2 System Analysis & Design

### 3.2.1 Use Case Diagram

The use case diagram + fully dressed use cases describing each function of the project.

### 3.2.2 Class Diagram

The diagram + description of all the main classes.

### 3.2.3 Sequence Diagram

### 3.2.4 Database Diagram

If you are implementing a database include the database schema plus a description of the tables.

# Implementation and Testing

This chapter should include:

* A detailed description of all the functions in the system.
* A detailed description of all the techniques and algorithms implemented.
* Description of any new technologies used in implementation.
* UI Design and Wireframes
* Testing procedures and levels used

# User Manual

This chapter should describe in details how to operate the project along with screen shots of the project representing all steps.

This chapter should also include an "Installation Guide" that would describe how to install the program, and all required third party tools that needs to be available for the project to run. The installation guide will also be included as a readme file in the CDs delivered at the end of the year.

# Conclusion and Future Work

## 6.1 Conclusion

A complete summary of the whole project along with the results obtained.

## 6.2 Future Work

What can be done in the future to improve the performance of the project and what additional functions could be added?

Add Appendices if you think it’s needed like:

1. Main code segments
2. Any surveys made

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