A logo of a person

Description automatically generatedA logo with text and a person's head

Description automatically generated

Minya University

Faculty of Computers and Information Minya, Egypt

Final Year Project Thesis in Preparation for graduation

**Submitted by:**

**Ahmed Abd El-Aziz Ahmed Saber Ragab**

**Kerolos Nabil Fahim Ahmed Amer Nasr El-Dien**

**Malak Mohammed Abd El-Ghani**

**Academic Year 2023-2024**

logo

**[Signify: Translate Sign Language to Arabic]**

**Supervised by:**

**Dr. Rehab Emad El-Dein T.A. Al-Zahraa Ahmed**

* **Abstract:**

Deafness is a disability that affects a person’s ability to hear, while muteness affects their ability to speak. Both conditions impact communication, but they do not limit a person’s capacity in other areas of life. The main barrier between deaf or mute individuals and the hearing-speaking community is effective communication. With tools to bridge this gap, such as sign language, people with these disabilities can navigate life just as easily as others.

Sign language is a critical tool for deaf and mute individuals to communicate with both each other and hearing people, yet it often receives minimal attention from the wider community. Many only recognize its importance when they have loved ones affected by hearing or speech disabilities. With the growing focus on accessibility, however, sign language recognition has emerged as a vital area of research within computer vision, promising advancements that could enhance communication and inclusion for all.

Our app is designed to bridge the communication gap, making it easier for deaf and mute individuals to communicate effectively. We offer an affordable, portable solution that uses computer vision to recognize and translate sign language into Arabic. Additionally, our system converts spoken audio directly into text. Through Natural Language Processing, each word or phrase is then matched with corresponding signs or images from our dataset, creating a seamless two-way communication tool for everyone.

* **Acknowledgement**

Table of Contents

**Abstract 1**

Acknowledgement 2

Contents3

List of Tables4

List of Figures5

List of Abbreviations 6

Introduction7

1.1 Problem Definition (or Motivation) 9

* **List of Tables**
* **List of Figures**
* **List of Abbreviations**

**ArSL:** Arabic Sign Language.

**Introduction**

Individuals with special needs often face discrimination and obstacles that restrict their participation in various societal activities. The lack of effective communication can result in the denial of their rights to live independently, pursue employment opportunities, or even move freely within their communities.

According to UNICEF there are 72 million deaf people worldwide, according to statistics from the World Federation of the Deaf. 80% of these people live in developing countries and use more than 300 sign languages.  In Egypt, there are many challenges facing the deaf, mute and hearing-impaired.

In today's world, communication technologies and tools such as Imo and WhatsApp have become integral to our daily lives. These platforms can significantly facilitate communication between the deaf community and the hearing majority. While deaf individuals can effectively communicate with each other using these technologies, they often face challenges when interacting with those who do not know sign language. Therefore, the development of automatic sign language translation systems is essential to provide equal communication opportunities and enhance public welfare.

In recent years, there has been a transformative shift worldwide aimed at bridging the gap and ensuring that individuals with disabilities enjoy the same standards of equality and rights as everyone else. Information technology has played a pivotal role in this new approach, with various assistive systems being developed to support deaf communities globally.

* 1. Problem Definition (or Motivation)

Deaf individuals in Arabic countries often rely on human interpreters for communication with the hearing majority, which can be both challenging to find and compromise privacy. To bridge this gap, there's a pressing need for the development of an automated system that can translate between Arabic Sign Language (ArSL) and Arabic speech or text. The focus here is on creating technology to seamlessly convert ArSL to Arabic and vice versa.

Given the rapid advancements in mobile technology, we can anticipate highly capable handheld and wearable devices in the near future. These devices should enable intuitive and natural interactions, possibly through 3D hand and body gestures, replacing traditional touchscreens and trackpads. This shift towards more intuitive interfaces is rooted in humans' natural experiences and physical interactions with their environment.

Technical challenges remain, including developing media technologies that can accurately detect, recognize, and track complex hand gestures. Achieving this will require innovative approaches and significant research to overcome the limitations of current technologies.

According to the World Health Organization (WHO), over 1.5 billion people globally live with hearing loss, and 430 million of them have disabling hearing loss. This population faces significant educational and employment disparities, with only 48% of individuals with hearing loss securing employment. These challenges often lead to social withdrawal, limited access to services, and emotional issues stemming from reduced self-esteem and confidence.

To address these issues, it's crucial to raise awareness about the capabilities and rights of individuals with hearing loss. Promoting understanding and empathy can help reduce discrimination and stigma, creating a more inclusive society.

Furthermore, governments and organizations should prioritize the development and implementation of policies that support the rights and well-being of people with hearing loss. This includes improving access to education, healthcare, and employment opportunities, as well as fostering an environment that encourages social inclusion and participation.

By addressing these key areas, we can help create a more supportive and equitable world for individuals with hearing loss, ensuring they have the same opportunities and rights as everyone else.

* 1. **Project Objectives**