|  |
| --- |
| **Project Name:** Smart Glasses for the Deaf and Mute  **Project Sponsor:** Dr. Ayman El-Sayed  **Project Manager:** Eng. Marwa Hassan  **Date:** October 11, 2025 |
| **Project Purpose and Justification:** The goal of this project is develop smart glasses that assist deaf and mute individuals in daily communication. The glasses will translate spoken language into sign language , and sign language into speech, while also providing vibration alerts when someone tries to call the user’s attention. This project aims to enhance the quality of life for people with hearing or speech disabilities by reducing communication barriers and promoting social inclusion. |
| **Project Description:** This project involves developing smart glasses designed to help deaf and mute individuals communicate effectively. The main features include:  - Translating spoken language ecaptured by the built-in microphone into sign language displayed through a built-in projector in glasses.  - Capturing sign language gestures using embedded cameras and converting them into natural speech using a voice system.  - Alerting the user through vibrations when someone nearby calls them, along with a visual indicator showing the direction of sound.  The glasses will function as a wearable device capable of performing AI processing for both vision and sound. |
| **Project Objectives:**   * Develop a functional prototype by April 15, 2026. * Achieve an 80% adoption rate among a test group of 10 deaf and mute participants. * Reduce ineffective communication time by 70% during early testing * Ensure translation accuracy above 90% under normal conditions |
| **Deliverables:**   * Fully functional smart glasses prototype with integrated software. * User manual and training sessions for participants. * Analytics module for evaluating translation accuracy and alert performance. |
| **Milestones & Timeline:**   * Requirements gathering: Oct 2025 * Design prototype: Nov 2025 * Development: Dec 2025 – Mar 2026 * Testing: Mar 2026 * Deployment & training: Apr 2026 |
|  |
| **Technical Requirements:**   * Platform: embedded smart glasses system connected to an Android or iOS application. c++/c/python for embedded system ,computer vision * Hardware: Arduino Nano or Arduino Micro, cameras, microphones, Raspberry Pi, vibration motors, built-in projector, Bluetooth, 8 hour battery (minimum). * Database: SQLite with Firebase * Performance: Real-time processing for up to 10 users, Response time less than 2 second. * Security: Role-based access, TLS encryption, GDPR compliance. * Integration: Google Speech-to-Text, Translate APIs, TensorFlow or MediaPipe for gestures. * User Interface: Mobile app user for monitoring and adjusting smart glasses settings. * Automation: Real-time translation, vibration alerts, sound direction indicators. * Backup and Recovery: Automatic backups and quick restore. |
| **Limits and Exclusions:**   * The project focuses on the prototype only; it does’t include commercial production.. * Mobile app functionality is limited to device pairing and basic settings control. * Only a basic set of sign language gestures is supported for communication and alerts. * Accuracy may be affected in noisy or low-light conditions. |
| **Approval:**   * Project Sponsor: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_ * Project Manager: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_ |
|  |