Project Proposal: Algerian Sign Language Recognition and Translation Using Computer Vision

I. Title

"Algerian Sign Language Recognition and Translation Using Computer Vision"

II. Objectives

The primary objectives of this project are as follows:

1. To develop a robust computer vision model for the recognition of Algerian Sign Language (ASL) signs from video input.
2. To implement a translation system that converts recognized ASL signs into Arabic text, enabling communication between deaf individuals using ASL and Arabic-speaking individuals.

III. Additional Objectives

In addition to the primary objectives, the project will also address the following objectives:

3. **Real-Time Recognition:** Create a real-time sign language recognition system that can interpret ASL signs as they are made, providing immediate feedback to users.
4. **Lexicon Expansion:** Incorporate an expanding lexicon of ASL signs, allowing the system to recognize a growing number of signs to enhance communication.
5. **User-Friendly Interface:** Design a user-friendly and accessible interface that promotes ease of use, making the system accessible to both ASL users and non-users.
6. **Adaptation to Local Variations:** Ensure that the system can adapt to variations in ASL signs specific to the Algerian region, considering the diversity within the sign language.

IV. Work Outline

The project will be divided into the following key phases:

1. **Research and Data Collection:**
   - Conduct a comprehensive review of existing sign language recognition and translation technologies.
   - Collect a diverse dataset of ASL signs used in Algeria, considering regional variations.
2. **Computer Vision Model Development:**
   - Develop a computer vision model for the real-time recognition of ASL signs.
   - Train and fine-tune the model using the collected dataset, with a focus on recognizing Algerian-specific signs.
3. **Translation System Implementation:**
   - Implement a translation system that converts recognized ASL signs into Arabic text.
   - Explore natural language processing techniques for accurate translation.
4. **User Interface Design:**

- Design an intuitive and user-friendly interface for the recognition and translation system.

    - Incorporate feedback mechanisms to assist users in improving their signing accuracy.

5. **Testing and Validation:**

    - Test the system's accuracy in recognizing ASL signs.

    - Evaluate the translation quality and speed.

    - Gather feedback from deaf individuals and Arabic-speaking users.

6. **Documentation and Reporting:**

    - Prepare detailed project documentation, including the system architecture, algorithms used, and dataset description.

    - Create user manuals and guidelines for the recognition and translation tool.

    - Generate a report summarizing the project's objectives, methodology, results, and recommendations.

V. Work Schedule (6 Months)

The project is expected to be completed within a six-month timeframe, with the following tentative schedule:

- **Month 1:** Research and Data Collection

- **Month 2:** Computer Vision Model Development

- **Month 3:** Translation System Implementation

- **Month 4:** User Interface Design

- **Month 5:** Testing and Validation

- **Month 6:** Documentation and Reporting

This schedule allows for continuous development, testing, and improvement throughout the project timeline, ensuring a well-rounded and effective ASL recognition and translation system.

In conclusion, this project aims to bridge the communication gap between individuals who use Algerian Sign Language and those who primarily communicate in Arabic. The recognition and translation system will empower the deaf community by providing them with a valuable tool for effective communication.