

# TEST PLAN FOR SILENT SPEECH

## *ChangeLog*

Version	Change Date	By	Description
version number	Date of Change	Name of person who made changes	Description of the changes made
001	05/11/2023	Shitiz Rajvanshi	Initial Draft

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# 1 Introduction

Communication is a fundamental human right, yet for individuals with speaking and hearing impairments, the simple act of expressing themselves and understanding others can be a daily struggle. The existing communication gap poses a significant challenge, hindering their ability to connect with the world around them. In recognition of this issue, we introduce an Android-based project, "Silent Speech," dedicated to addressing these communication challenges and empowering those with impairments.

Our project, "Silent Speech: Bridging the Gap," is a pioneering initiative aimed at revolutionizing the way individuals with speaking and hearing impairments interact with the world. With a focus on technological innovation, we aim to provide a comprehensive solution to help these individuals communicate effectively.

The heart of our project lies in a set of six key functions: text to sign, sign to text, speech to sign, image to sign, object detection, and language identification. These functions, integrated into a user-friendly Android application, will break down the communication barriers that exist between those who understand sign language and those who do not.

Text-to-sign conversion allows hearing-impaired individuals to express themselves through sign language, while sign-to-text facilitates understanding for those who may not be fluent in sign language. Our voice-to-sign function takes spoken words and converts them into sign gestures, ensuring a seamless transition from speech to sign language. Image-to-sign opens the door to a world of visual data, extracting text from images and translating it into sign language, providing access to information that was previously inaccessible.

Object detection and language identification further enhance the capabilities of our application, making it adaptable to different sign language dialects, languages, and contextual cues. The need for accurate real-time translation of sign language into text or speech is met with our advanced technology.

"Silent Speech: Bridging the Gap" is not just an Android-based project; it's a testament to the power of technology to bridge the divides that have existed for too long. We are committed to making communication accessible, inclusive, and empowering for everyone, regardless of their abilities. Join us on this journey of innovation, inclusion, and transformation.

## 1.1 Scope

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### 1.1.1 In Scope

#### 1. Text-to-Sign Conversion

- The system must accurately convert text input into sign language gestures.
- It should support multiple languages and sign language dialects to cater to a diverse user base.

- Users should have the option to customize sign language style preferences.
2. **Real-time Speech-to-Sign Conversion**
    - The application must be able to translate spoken words into corresponding sign gestures in real-time.
    - It should provide clear visual representations of the signs, ensuring that users can follow the translation easily.
    - The system should allow users to adjust the translation speed to their preference.
  3. **Object Detection and Language Identification**
    - The project must be capable of recognizing and adapting to different objects and contexts.
    - It should identify the language spoken or the language of the text for accurate translation.
    - Users should have the option to customize object and language recognition settings.

## 1.1.2 Out of Scope

### 1. Usability

- The user interface should be intuitive and easy to navigate.
- Response times for translations should be fast, ensuring a seamless user experience.
- The application must comply with accessibility standards to cater to users with various disabilities.

### 2. Security and Privacy

- The project must ensure the privacy and security of user data, especially when processing sensitive information.
- Data transmission and storage should be encrypted to protect user information.
- The application must comply with relevant privacy regulations and guidelines.

### 3. Scalability and Performance

- The system should be scalable to accommodate a growing user base and increased usage.
- It must operate efficiently on various Android devices, including smartphones and tablets

## 1.2 Quality Objective

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Here make a mention of the overall objective that you plan to achieve without your testing

Some objectives of your testing project could be

- Ensure the Application Under Test conforms to functional and non-functional requirements
- Ensure the AUT meets the quality specifications defined by the client
- Bugs/issues are identified and fixed before go live

## 1.3 Roles and Responsibilities

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Detail description of the Roles and responsibilities of different team members like

- **QA Analyst** : Shitiz Rajvanshi  
The Quality Assurance (QA) Analyst conducted testing on software, websites, and other technical products to identify and resolve bugs, defects, and other potential issue.
- **Test Manager** : Ms. Shreela Pareek  
Managed all test processes, including test plans, resources, costs, timescales, test deliverables and traceability.
- **Configuration Manager** : Ms. Neha Shukla
- **Developers** : Shubham Goel , Taniya Singh , Shitiz Rajvanshi  
Developed the model and trained it.
- **Installation Team** : Shubham Goel , Taniya Singh , Shitiz Rajvanshi, Shreela Pareek, Neha Shukla  
Responsible for smooth execution of the program

## 2 Test Methodology

### 2.1 Overview

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The decision to adopt a Waterfall methodology for a project is typically based on specific project requirements, constraints, and organizational factors. Here are some common reasons for choosing the Waterfall methodology:

- **Well-Defined Requirements**: When the project has clearly defined and stable requirements that are unlikely to change significantly throughout the project's lifecycle. Waterfall is suitable when you can gather and document all the requirements up front.
- **Low Uncertainty**: If there is a high level of confidence in the project scope and objectives, and the technology and processes to be used are well-understood, Waterfall can be a good choice. It is less adaptable to uncertainty and change.
- **Regulatory Compliance**: In cases where the project needs to adhere to strict regulatory or compliance standards, Waterfall provides a structured and documented approach that can help meet these requirements.
- **Large-Scale and Complex Projects**: Waterfall can be beneficial for large-scale, complex projects where a comprehensive and detailed project plan is essential for successful execution.

### 2.2 Test Levels

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Testing a Web Application Firewall (WAF) typically involves multiple test levels to ensure comprehensive coverage of its security features and effectiveness. These test levels can be organized as follows:

#### 1. Unit Testing:

- **Rule Validation**: Verify that individual security rules within the WAF are correctly configured and accurately detect or block specific types of attacks.

- **Logging and Alerting:** Test that the WAF generates appropriate logs and alerts for specific rule violations.

## 2. Integration Testing:

- **Rule Interaction:** Assess how different security rules interact when multiple rules are applied to the same request or response. Ensure they do not conflict or produce unintended outcomes.
- **Communication with Other Security Components:** Test the WAF's ability to integrate with other security components in your infrastructure, such as intrusion detection systems (IDS) or load balancers.

## 3. System Testing:

- **Rule Coverage:** Validate that the WAF provides comprehensive coverage for known vulnerabilities and attacks, including SQL injection, cross-site scripting (XSS), cross-site request forgery (CSRF), and other common web application threats.
- **Custom Rule Testing:** Ensure that any custom rules configured to protect application-specific vulnerabilities are working as intended.

## 2.3 Test Completeness

Few criteria to check Test Completeness are:

- 100% test coverage
- All open bugs are fixed or will be fixed in next release

# 3 Test Deliverables

Here mention all the Test Artifacts that will be delivered during different phases of the testing lifecycle.

Here are the sample deliverables

- Test Cases :

### 1. Text to sign test Cases

S. No	Test Case No.	Input	Description	Expected Output	Actual Output	Remark
1	T1	<a href="https://photos.app.goo.gl/d6HxKiQAIPRN5zx36">https://photos.app.goo.gl/d6HxKiQAIPRN5zx36</a>	Model must identify a single character	<a href="https://photos.app.goo.gl/d6HxKiQAIPRN5zx36">https://photos.app.goo.gl/d6HxKiQAIPRN5zx36</a>	<a href="https://photos.app.goo.gl/d6HxKiQAIPRN5zx36">https://photos.app.goo.gl/d6HxKiQAIPRN5zx36</a>	Valid
2	T2	<a href="https://photos.app.goo.gl/1ta76J2QpuevbhTA">https://photos.app.goo.gl/1ta76J2QpuevbhTA</a>	Model must identify a single word	<a href="https://photos.app.goo.gl/1ta76J2QpuevbhTA">https://photos.app.goo.gl/1ta76J2QpuevbhTA</a>	<a href="https://photos.app.goo.gl/1ta76J2QpuevbhTA">https://photos.app.goo.gl/1ta76J2QpuevbhTA</a>	Valid
3	T3	<a href="https://photos.app.goo.gl/xRkBTeb89yytSme9A">https://photos.app.goo.gl/xRkBTeb89yytSme9A</a>	Model must identify a group of words	<a href="https://photos.app.goo.gl/xRkBTeb89yytSme9A">https://photos.app.goo.gl/xRkBTeb89yytSme9A</a>	<a href="https://photos.app.goo.gl/xRkBTeb89yytSme9A">https://photos.app.goo.gl/xRkBTeb89yytSme9A</a>	Valid
4	T4	<a href="https://photos.app.goo.gl/f91ocB2prTX24UxX8">https://photos.app.goo.gl/f91ocB2prTX24UxX8</a>	Model must identify a group of words and number	<a href="https://photos.app.goo.gl/f91ocB2prTX24UxX8">https://photos.app.goo.gl/f91ocB2prTX24UxX8</a>	<a href="https://photos.app.goo.gl/f91ocB2prTX24UxX8">https://photos.app.goo.gl/f91ocB2prTX24UxX8</a>	Valid
5	T5	<a href="https://photos.app.goo.gl/okNgF9LJLih1DztX7">https://photos.app.goo.gl/okNgF9LJLih1DztX7</a>	Model must identify a single number	<a href="https://photos.app.goo.gl/okNgF9LJLih1DztX7">https://photos.app.goo.gl/okNgF9LJLih1DztX7</a>	<a href="https://photos.app.goo.gl/okNgF9LJLih1DztX7">https://photos.app.goo.gl/okNgF9LJLih1DztX7</a>	Valid

### 2. Voice to sign test Cases

Serial No.	Test Case No.	Input Data	Description	Expected Output	Actual Output	Remark
1	T1	<a href="https://photos.app.goo.gl/BXxYG13S7EawN8Hr5">https://photos.app.goo.gl/BXxYG13S7EawN8Hr5</a>	Identify single alphabet	<a href="https://photos.app.goo.gl/BXxYG13S7EawN8Hr5">https://photos.app.goo.gl/BXxYG13S7EawN8Hr5</a>	<a href="https://photos.app.goo.gl/BXxYG13S7EawN8Hr5">https://photos.app.goo.gl/BXxYG13S7EawN8Hr5</a>	Valid
2	T2	<a href="https://photos.app.goo.gl/opQ4TQ1Xt4DFFoCQA">https://photos.app.goo.gl/opQ4TQ1Xt4DFFoCQA</a>	Identify single word	<a href="https://photos.app.goo.gl/opQ4TQ1Xt4DFFoCQA">https://photos.app.goo.gl/opQ4TQ1Xt4DFFoCQA</a>	<a href="https://photos.app.goo.gl/opQ4TQ1Xt4DFFoCQA">https://photos.app.goo.gl/opQ4TQ1Xt4DFFoCQA</a>	Valid
3	T3	<a href="https://photos.app.goo.gl/fSiXyPtTVtoBS9x9">https://photos.app.goo.gl/fSiXyPtTVtoBS9x9</a>	Identify multiple words	<a href="https://photos.app.goo.gl/fSiXyPtTVtoBS9x9">https://photos.app.goo.gl/fSiXyPtTVtoBS9x9</a>	<a href="https://photos.app.goo.gl/fSiXyPtTVtoBS9x9">https://photos.app.goo.gl/fSiXyPtTVtoBS9x9</a>	Valid
4	T4	<a href="https://photos.app.goo.gl/2vtg4WBiGkv3JT5M6">https://photos.app.goo.gl/2vtg4WBiGkv3JT5M6</a>	Identify single number	<a href="https://photos.app.goo.gl/2vtg4WBiGkv3JT5M6">https://photos.app.goo.gl/2vtg4WBiGkv3JT5M6</a>	<a href="https://photos.app.goo.gl/2vtg4WBiGkv3JT5M6">https://photos.app.goo.gl/2vtg4WBiGkv3JT5M6</a>	Valid
5	T5	<a href="https://photos.app.goo.gl/YpkhUyCINbkXio5A">https://photos.app.goo.gl/YpkhUyCINbkXio5A</a>	Identify combination of number and word	<a href="https://photos.app.goo.gl/YpkhUyCINbkXio5A">https://photos.app.goo.gl/YpkhUyCINbkXio5A</a>	<a href="https://photos.app.goo.gl/YpkhUyCINbkXio5A">https://photos.app.goo.gl/YpkhUyCINbkXio5A</a>	Valid

### 3. Image to sign test cases

Serial No.	Test Case No.	Input Data	Description	Expected Output	Actual Output	Remark
1	T1	<a href="https://photos.app.goo.gl/WLSyDFsat8yhdw5w9">https://photos.app.goo.gl/WLSyDFsat8yhdw5w9</a>	Identify single alphabet	<a href="https://photos.app.goo.gl/WLSyDFsat8yhdw5w9">https://photos.app.goo.gl/WLSyDFsat8yhdw5w9</a>	<a href="https://photos.app.goo.gl/WLSyDFsat8yhdw5w9">https://photos.app.goo.gl/WLSyDFsat8yhdw5w9</a>	Valid
2	T2	<a href="https://photos.app.goo.gl/ei7NHQtpLUuipKkr6">https://photos.app.goo.gl/ei7NHQtpLUuipKkr6</a>	Identify single word	<a href="https://photos.app.goo.gl/ei7NHQtpLUuipKkr6">https://photos.app.goo.gl/ei7NHQtpLUuipKkr6</a>	<a href="https://photos.app.goo.gl/ei7NHQtpLUuipKkr6">https://photos.app.goo.gl/ei7NHQtpLUuipKkr6</a>	Valid
3	T3	<a href="https://photos.app.goo.gl/gziDvB84M1MpSX187">https://photos.app.goo.gl/gziDvB84M1MpSX187</a>	Identify multiple words	<a href="https://photos.app.goo.gl/gziDvB84M1MpSX187">https://photos.app.goo.gl/gziDvB84M1MpSX187</a>	<a href="https://photos.app.goo.gl/gziDvB84M1MpSX187">https://photos.app.goo.gl/gziDvB84M1MpSX187</a>	Valid
4	T4	<a href="https://photos.app.goo.gl/8VgpML74M31qKvxF6">https://photos.app.goo.gl/8VgpML74M31qKvxF6</a>	Identify single number	<a href="https://photos.app.goo.gl/8VgpML74M31qKvxF6">https://photos.app.goo.gl/8VgpML74M31qKvxF6</a>	<a href="https://photos.app.goo.gl/8VgpML74M31qKvxF6">https://photos.app.goo.gl/8VgpML74M31qKvxF6</a>	Valid
5	T5	<a href="https://photos.app.goo.gl/i6Bxq2GuSeVC9TME7">https://photos.app.goo.gl/i6Bxq2GuSeVC9TME7</a>	Identify combination of number and word	<a href="https://photos.app.goo.gl/i6Bxq2GuSeVC9TME7">https://photos.app.goo.gl/i6Bxq2GuSeVC9TME7</a>	<a href="https://photos.app.goo.gl/i6Bxq2GuSeVC9TME7">https://photos.app.goo.gl/i6Bxq2GuSeVC9TME7</a>	Valid

- Requirement tracability matrix (RTM)

Requirement ID	Requirement Description	Requirement Description	Implementation Phase	Testing Phase	Verification Phase
REQ-001	Text-to-Sign Conversion	Design the user interface for text input and sign language output.	Implement the functionality for converting text to sign language.	Test the accuracy of text-to-sign conversions for different languages.	Verify that sign language gestures match the provided text.
REQ-002	Real-time Speech-to-Sign Conversion	Design the speech recognition and sign language translation algorithms.	Implement the real-time speech-to-sign conversion feature.	Test the system's ability to translate spoken words into sign gestures in real-time.	Verify the accuracy and responsiveness of speech-to-sign conversion.
REQ-003	Object Detection and Language Identification	Design the object recognition and language identification components.	Implement object detection and language recognition capabilities.	Test the system's ability to identify objects and recognize spoken languages.	Verify the accuracy and adaptability of object and language detection.
REQ-004	Usability	Design an intuitive and user-friendly interface.	Implement the user interface design.	Test the application's ease of use and navigation.	Verify that the user interface meets accessibility standards.

- Test Metrics  
Test Matrix for Text to sign Conversion

Test Case ID	Requirement ID	Test Description	Test Steps	Expected Results	Status (Pass/Fail)
TC-TS-001	REQ-001	Verify text-to-sign conversion for a single word.	1. Enter a single word. 2. Click "Convert."	Sign language gesture for the word displayed.	Status (Pass/Fail)
TC-TS-002	REQ-001	Test text-to-sign conversion for a sentence.	1. Enter a sentence. 2. Click "Convert."	Sign language gestures for all words in the sentence displayed.	PASS
TC-TS-003	REQ-001	Test text-to-sign conversion for different languages.	1. Enter text in various languages. 2. Click "Convert."	Accurate sign language representations for each language.	PASS
TC-TS-004	REQ-001	Test customization of sign language style.	1. Select different sign language styles. 2. Enter text and click "Convert."	Sign language gestures follow the selected style.	PASS

#### Test Matrix for Realtime Voice to sign conversion

Test Case ID	Requirement ID	Test Description	Test Steps	Expected Results	Status (Pass/Fail)
TC-SS-001	REQ-002	Verify real-time speech-to-sign conversion for simple phrases.	1. Speak simple phrases. 2. Observe real-time sign language conversion.	Accurate and responsive sign language gestures for spoken phrases.	PASS
TC-SS-002	REQ-002	Test adaptation to different spoken languages.	1. Speak in multiple languages. 2. Observe real-time sign language conversion.	Accurate sign language gestures corresponding to the spoken language.	PASS
TC-SS-003	REQ-002	Test customization of conversion speed.	1. Adjust conversion speed settings. 2. Speak and observe real-time conversion.	Sign language gestures adapt to the selected speed settings.	PASS

## 4 Resource & Environment Needs

### 4.1 Testing Tools

No Testing Tool is required. Manual Testing is done.

### 4.2 Test Environment

It mentions the minimum **hardware** requirements that will be used to test the Application. The following **software's** are required in addition to client-specific software.

- Android Studio
- Android Device
- Camera and Microphone

## 5 Terms/Acronyms

Make a mention of any terms or acronyms used in the project

TERM/ACRONYM	DEFINITION
API	Application Program Interface



TERM/ACRONYM	DEFINITION
AUT	Application Under Test

Test Case ID	Requirement ID	Test Description	Test Steps	Expected Results	Status (Pass/Fail)
TC-TS-001	REQ-001	Verify text-to-sign conversion for a single word.	1. Enter a single word. 2. Click "Convert."	Sign language gesture for the word displayed.	PASS
TC-TS-002	REQ-001	Test text-to-sign conversion for a sentence.	1. Enter a sentence. 2. Click "Convert."	Sign language gestures for all words in the sentence displayed.	PASS
TC-TS-003	REQ-001	Test text-to-sign conversion for different languages.	1. Enter text in various languages. 2. Click "Convert."	Accurate sign language representations for each language.	PASS
TC-TS-004	REQ-001	Test customization of sign language style.	1. Select different sign language styles. 2. Enter text and click "Convert."	Sign language gestures follow the selected style.	PASS