

DEVELOPER

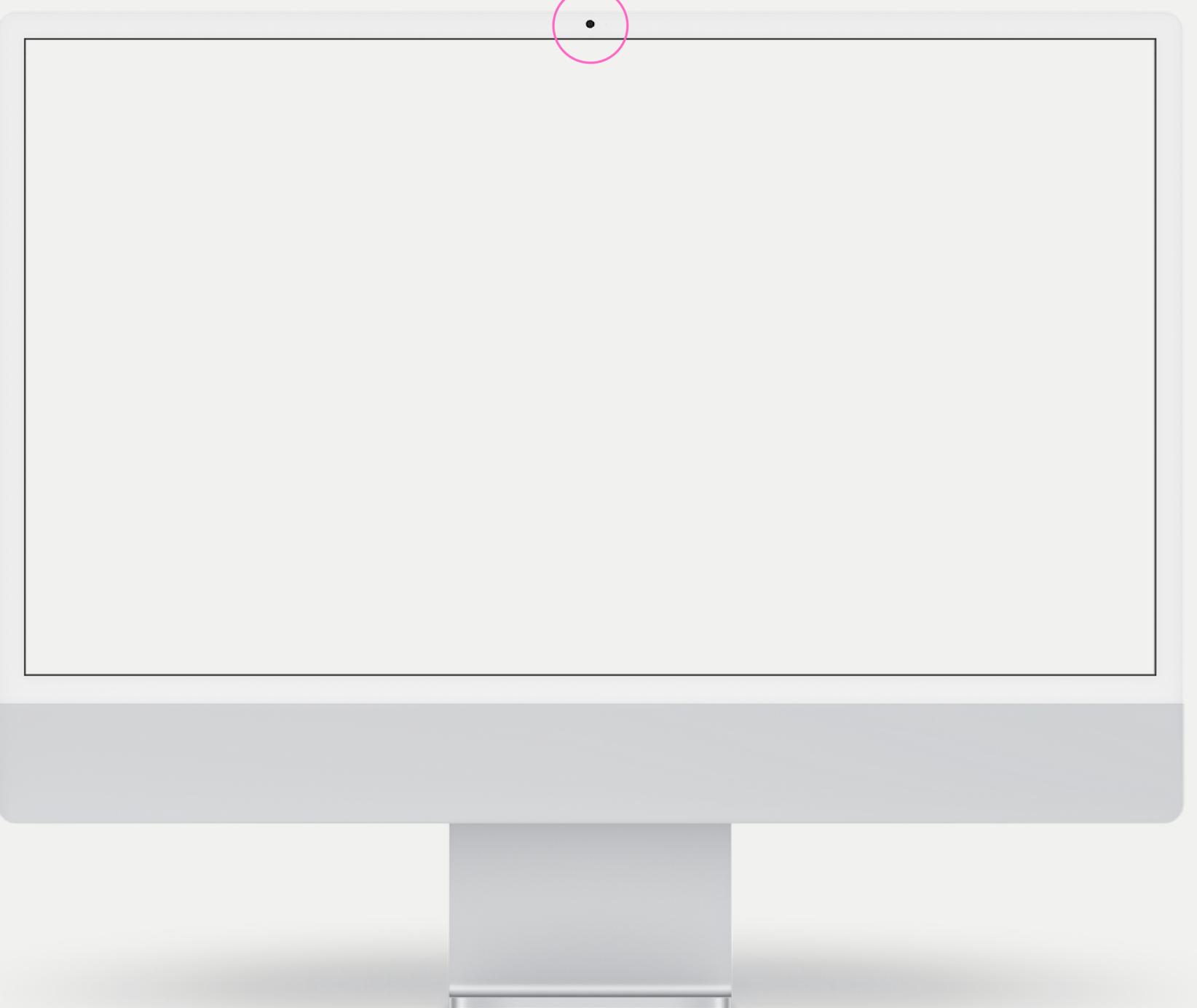
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COLLEGE

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Hand Sign Recognition

Voice isn't the only means of communication



INTRODUCTION

Problem Statement

Science and Technology have made Human life addictive to comfort but still there exists an underprivileged group of people who are fighting for finding an innovative way that can make the process of communication easier for them. According to the World Health Organization, about **300 million** people in the world are deaf and **1 million** are dumb.

Communication being a fundamental aspect of human life is very much difficult for these people

Design and Develop a website/application to tackle the situation.

NEXT

APPROACH

Project Summary

HAND SIGN RECOGNISER



HAND SIGN RECOGNISER is a Web Application that is a revolution in the space of communication for people who have problems in hearing and speaking.

We use the latest technology like Computer Vision, ReactJS to empower the specially abled to do our part for society

NEXT

WHY THIS?

Social Impact & Sustainability

- It is an effort to bridge the gap in the process of communication for deaf & dumb people.
- This Website can detect the hand gestures or the Sign Language of any person and can convey his/her message to everyone via TEXT.
- This will Open up a pool of opportunities for the needy in various sectors like Education, Sales, Marketing, HR.
- One such example is a News Reader.

NEXT

RESEARCH

Tech Stack

FRONT END :



HTML

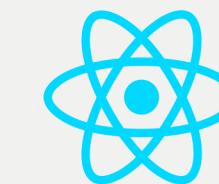


CSS



JAVASCRIPT

FRAMEWORK :



React

REACT JS

APPLICATION PROGRAMMING INTERFACE :



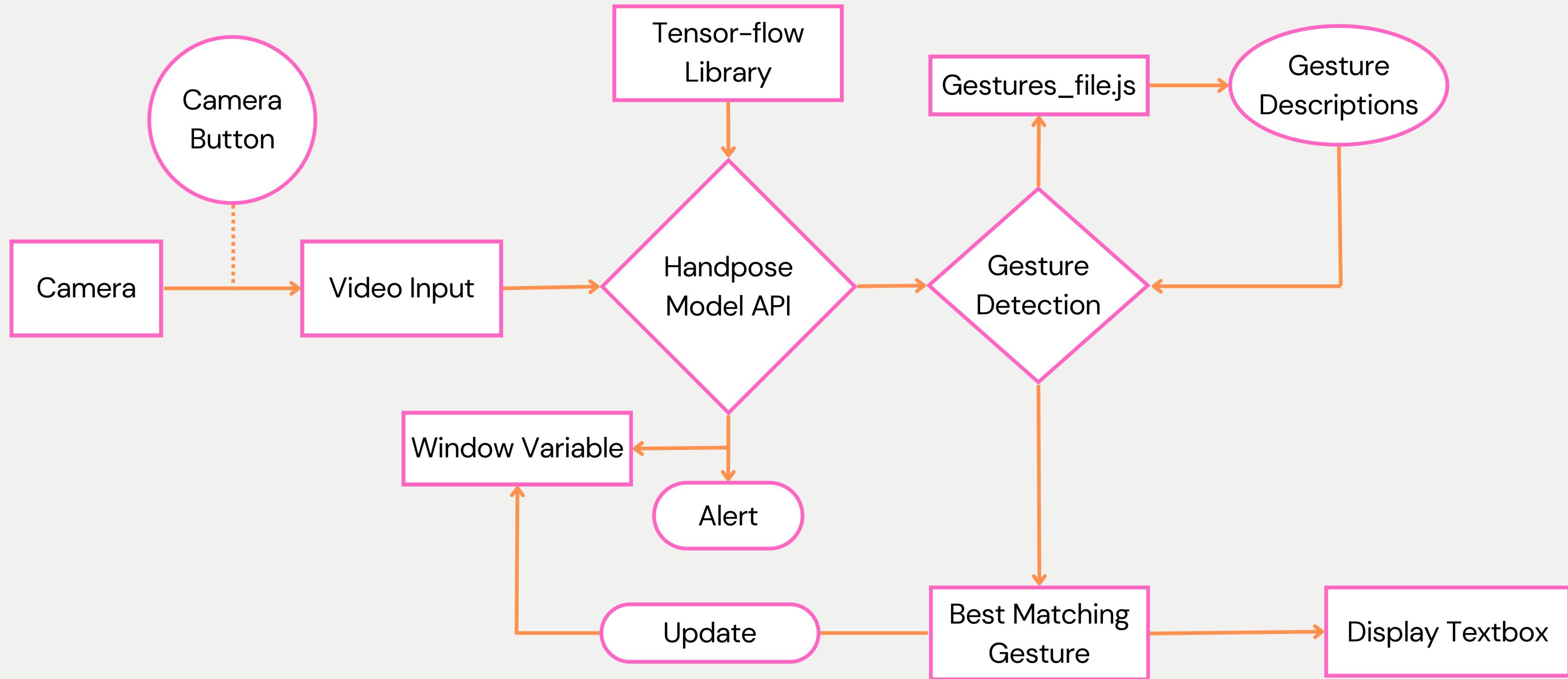
TENSORFLOW



MEDIPIPE

NEXT

Work-Flow



RESEARCH

Explanation

Hand gesture recognition is one of the system that can detect the hand gestures in a real time video.

The output format is as follows:

- **Hands** represent an array of detected hand predictions in the image frame.
- For each hand, the structure contains a prediction of the handedness (left or right) as well as a **confidence score** of this prediction.
- An array of **21** key points is also returned, where each key point contains: (x, y, name)
- This data is fetched by React JS through API.

React, now, does the job on the Front End. It translates the gesture into **Text format** with the help of the predefined meanings just like vocabulary of a language is defined.

NEXT

RESEARCH

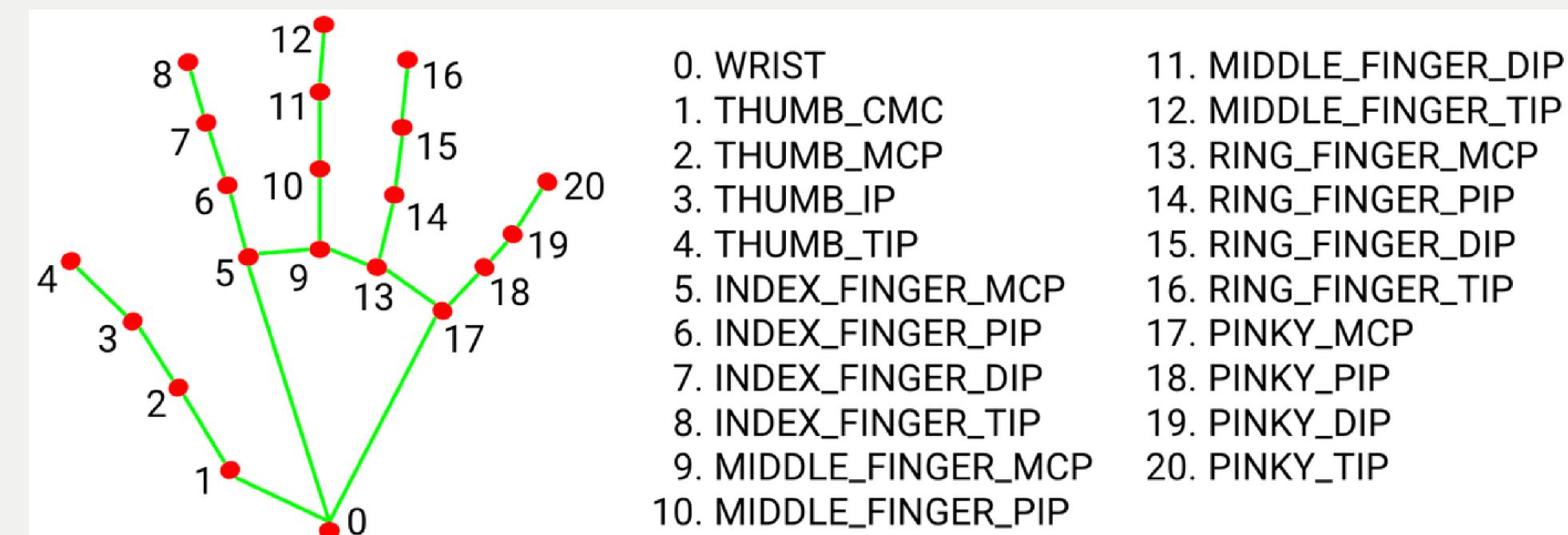
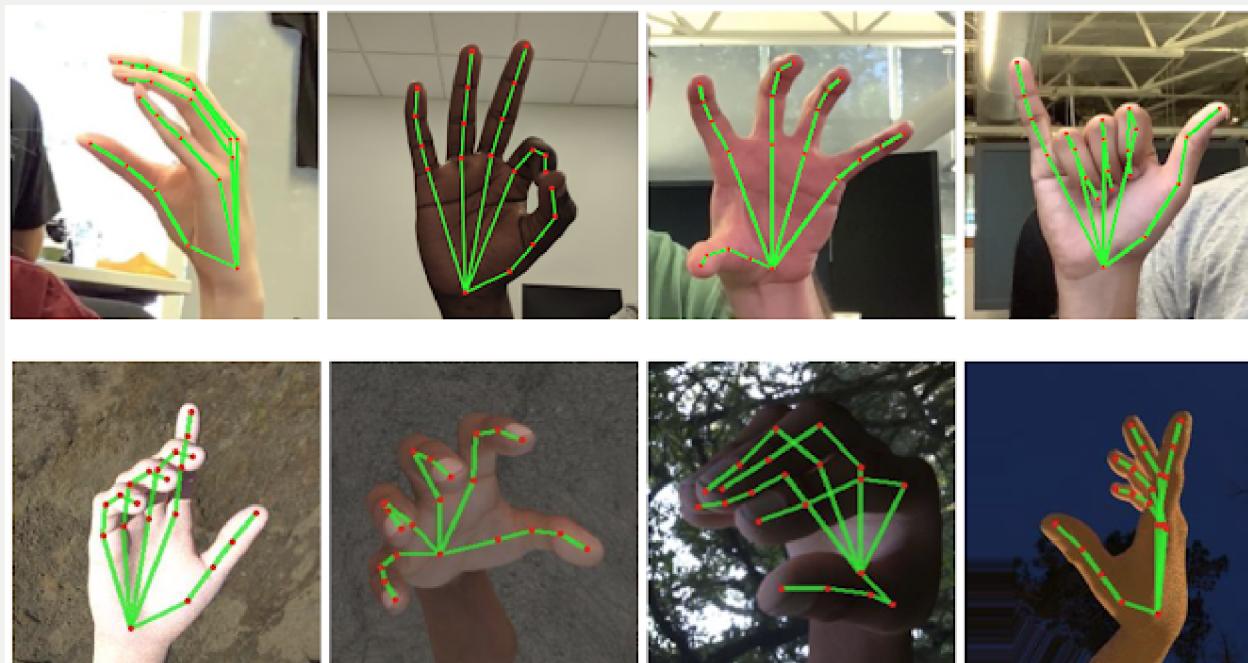
Explanation

MEDIPIPE HANDS

MediaPipe Hands is a high-fidelity **hand and finger tracking** solution. It employs machine learning (ML) to infer **21** 3D landmarks of a hand from just a single frame.

MediaPipe Hands utilizes an ML pipeline consisting of multiple models working together:

- A palm detection model that operates on the full image and returns an **oriented hand-bounding box**.
- A hand landmark model that operates on the cropped image region defined by the palm detector and returns **high-fidelity 3D hand keypoints**.



NEXT

RESEARCH

Explanation

Why is Computer Vision Functionality used on front End?

Reasons are as follows :-

- It is Easier to integrate the CV functionality on the website.
- The API of Handpose Model of Mediapipe by Google is very extensive & gives us freedom to work as per our requirements.
- To make the website faster & more efficient.
- It is easier to identify bugs & rectify them.

NEXT

ACTIVATION

Project Plan

DAY 1 & 2

Ideation

Identifying a Problem Statement and Designing the Initial Approach

DAY 4 & 5

Implementation

Implementation of the Approach using the selected Tech Stack

DAY 6 & 7

Designing the Web Page

Designing the Interface and sourcing of the visuals.

DAY 3

Choosing the Tech Stack

Choosing the appropriate Tech Stack and API technologies

DAY 5

Identifying the Bugs

Identifying the Bugs and the Errors in the system and Rectifying Accordingly

DAY 8&9

Revisions

Collecting feedback on the usability by peers and further iterating it and Documenting the process in a Deck.

NEXT

REFERENCE

Video of Working Model

LIST OF GESTURES :

1. Thumbs Up
2. Thumbs Down
3. Victory
4. One finger Pointing up
5. Open Palm

and much more to add...

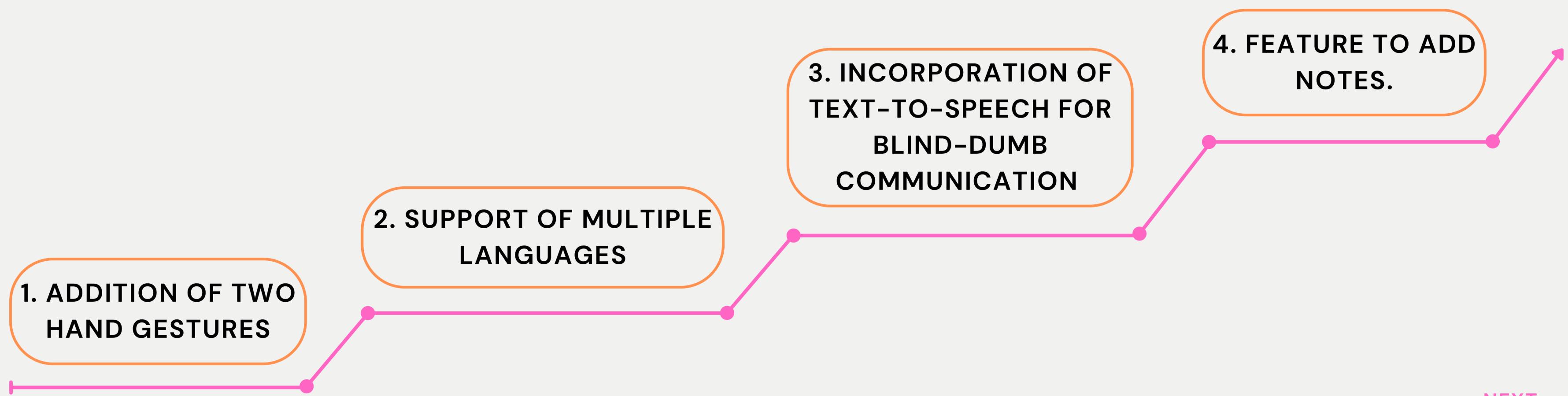
VIDEO FOR REFERENCE :

Uploaded in the Repository itself

NEXT

WHAT NEXT?

Future Prospects



Thank You



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