

PROJECT REVIEW 01

A Computer Vision Project Using GOOGLE MEDIAPIPE

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PROJECT: What You Need to Know

UNDERSTAND HOW CV HELPS IN CHANGING THE WORLD

CV Defined

The Difference between AI and CV

Where CV can be used

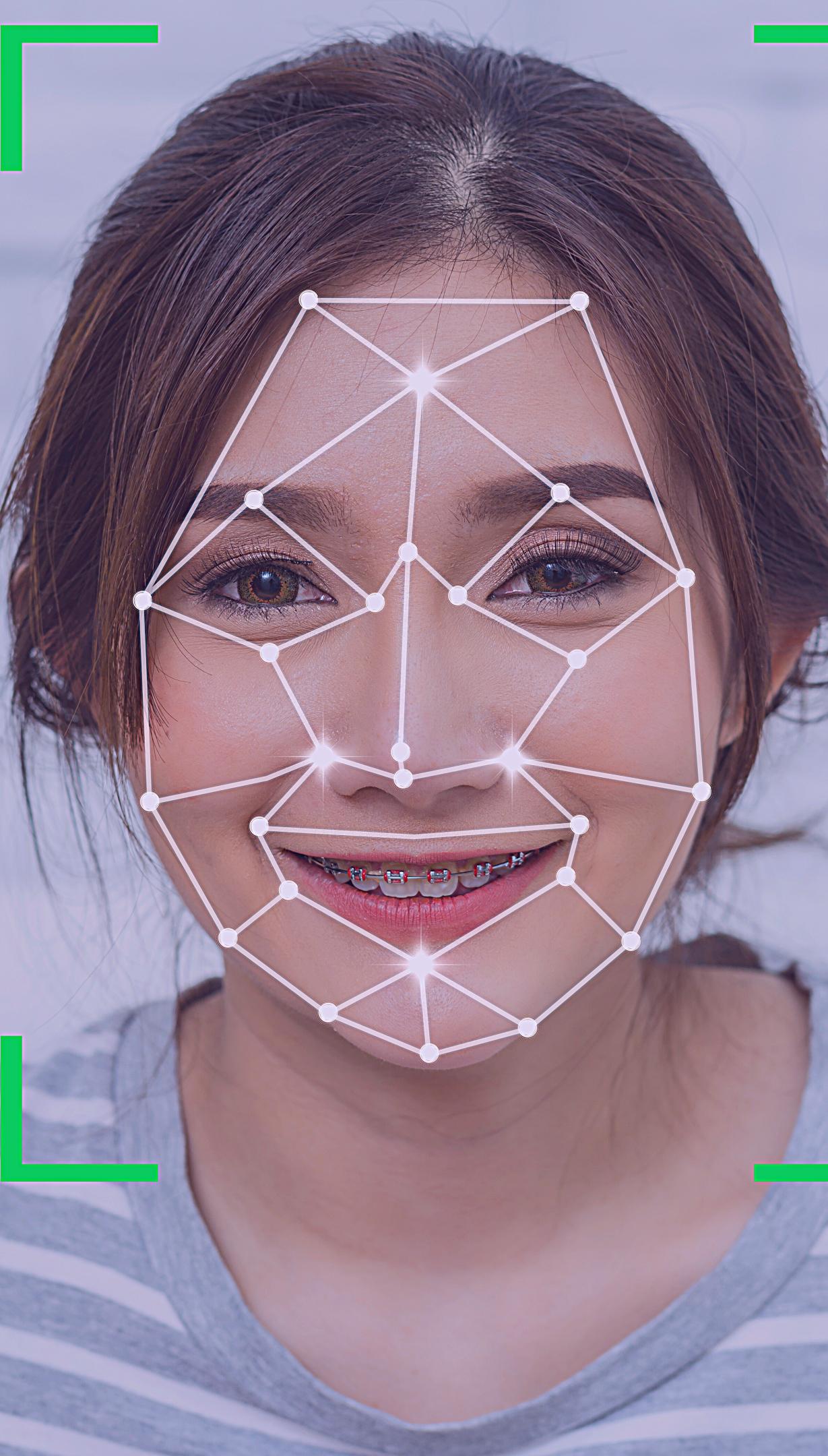
Why CV in this project

Project Implementation

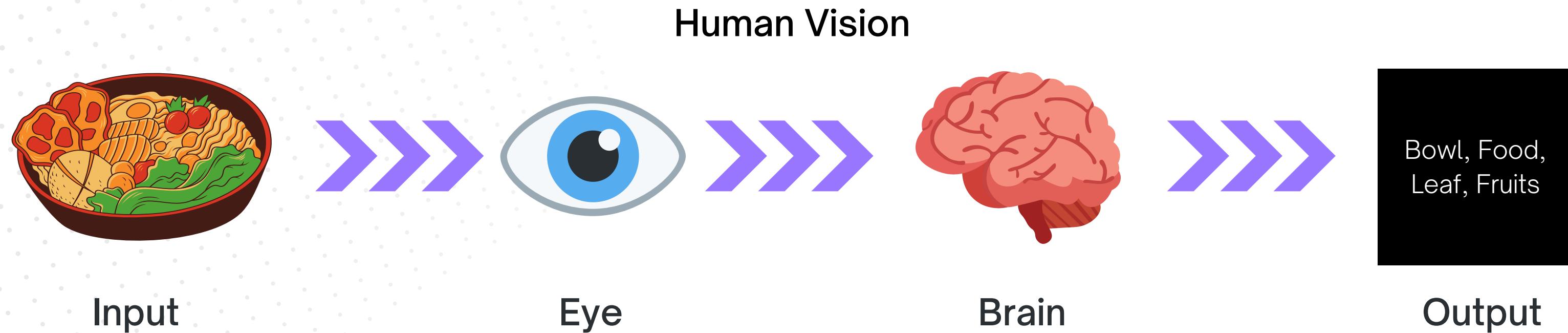
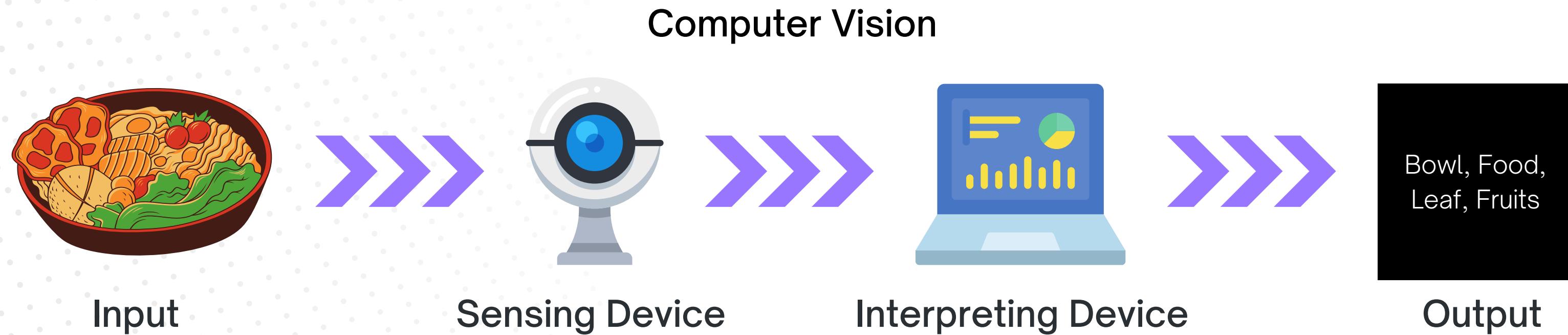
So far...

CV Defined

Computer vision enables computers and systems to derive meaningful information from digital images, videos and other visual inputs. It is used to detect and classify objects (e.g., road signs or traffic lights), create 3D maps or motion estimation, and played a key role in making autonomous vehicles a reality.



How Does Computer Vision Work?



Artificial Intelligence VS Computer Vision

THE NEXT GENERATION OF MACHINE INTELLIGENCE

Computer vision is a field of artificial intelligence (AI) that enables computers and systems to derive meaningful information from digital images, videos and other visual inputs and take actions or make recommendations based on that information.

Artificial Intelligence

Artificial intelligence (AI) is the ability of a machine to imitate intelligent human behavior.

It enables machines to process information and make decisions based on logic and reasoning.

Computer Vision

Computer vision is a field of artificial intelligence (AI).

It enables computers and systems to derive meaningful information from digital images, videos and other visual inputs and take actions or make recommendations based on that information.

Artificial Intelligence

Technology Landscape

Computer
Vision

Machine
Learning

Autonomous
Systems

Natural Language
Processing

Pattern
Recognition

Neuromorphic
Computing

Cognitive
Cyber-Security

Robotic
Personal Assistants

Autonomous
Surgical Robotics

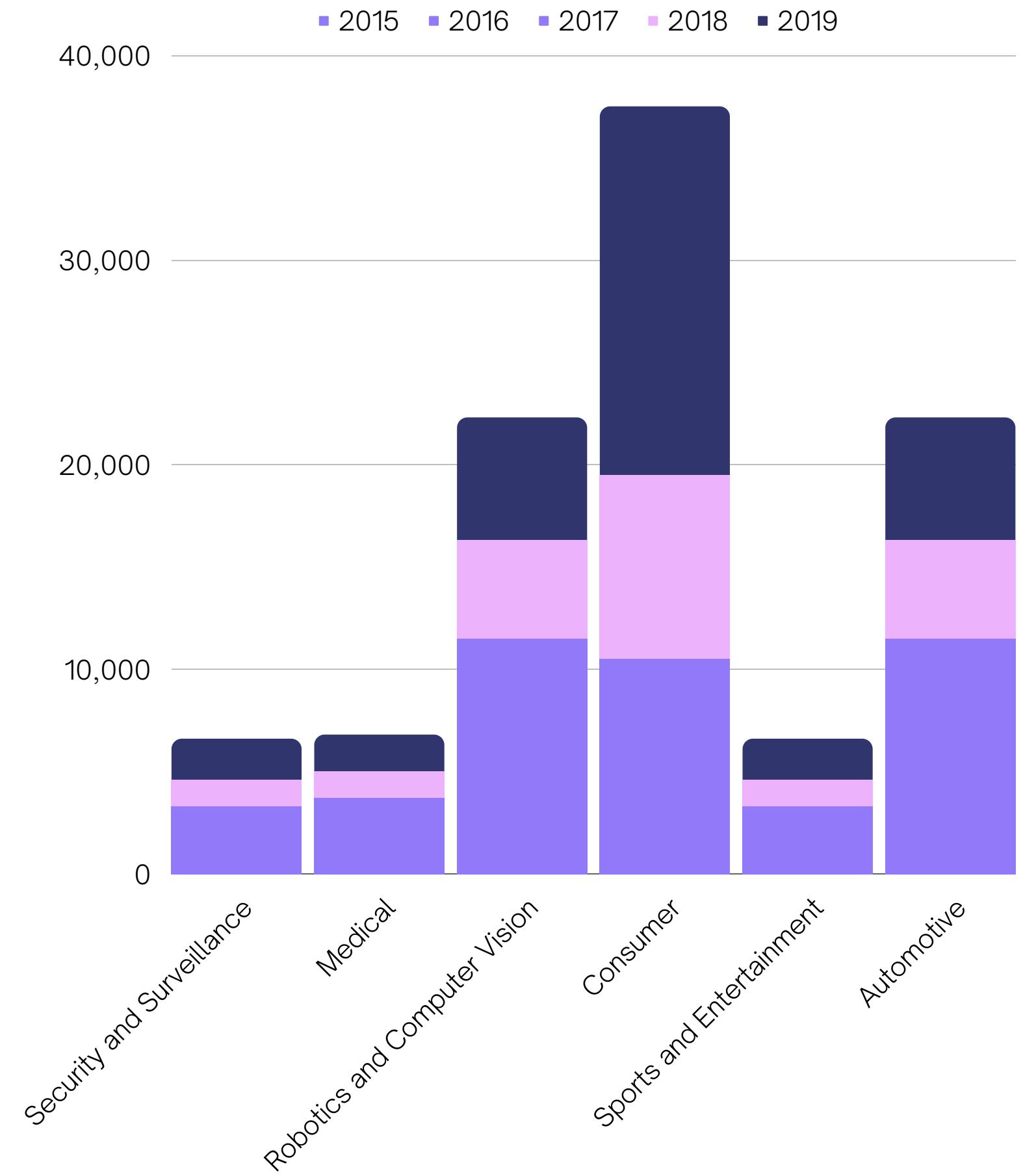
Next-Gen
Cloud Robotics

CV - AI Market Revenues in the World

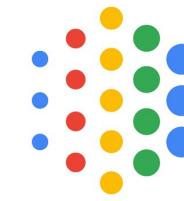
FROM 2015 TO 2019

Source :

<https://indatalabs.com/blog/applications-computer-vision-across-industries>



Computer Vision using Google AI. MediaPipe



Google AI -- MediaPipe

MediaPipe is a cross-platform framework for building multimodal applied machine learning pipelines created by Google AI.

End-to-End acceleration

Built-in fast ML inference and processing accelerated even on common hardware

Ready-to-use solutions

Cutting-edge ML solutions demonstrating full power of the framework

Free and open source

Framework and solutions both under Apache 2.0, fully extensible and customizable

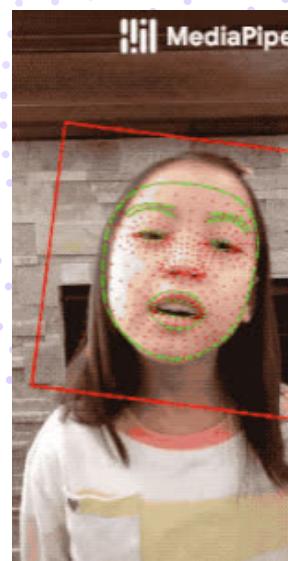
ML solutions in MediaPipe

MediaPipe offers cross-platform,
customizable ML solutions for live
and streaming media.

Face Detection



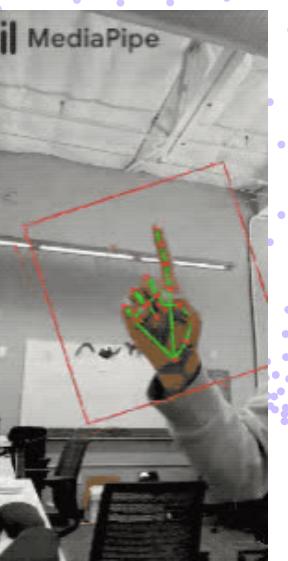
Face Mesh



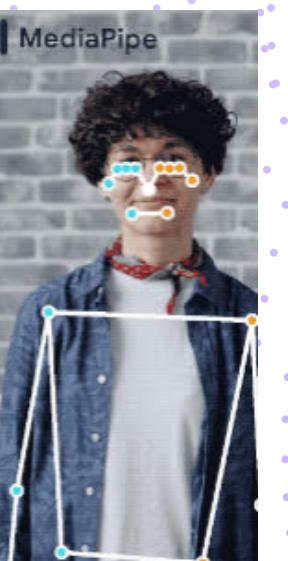
Iris



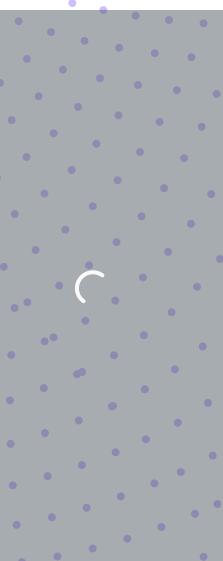
Hands



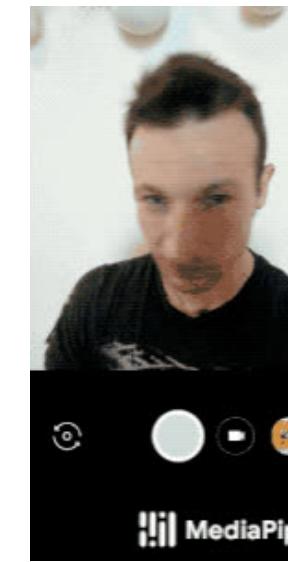
Pose



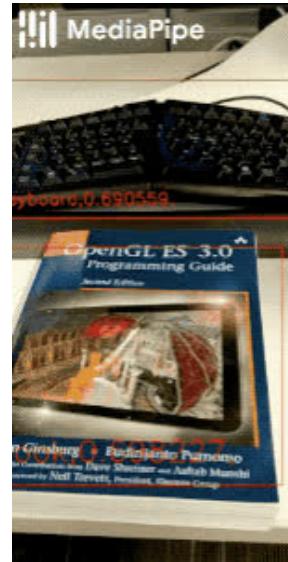
Holistic



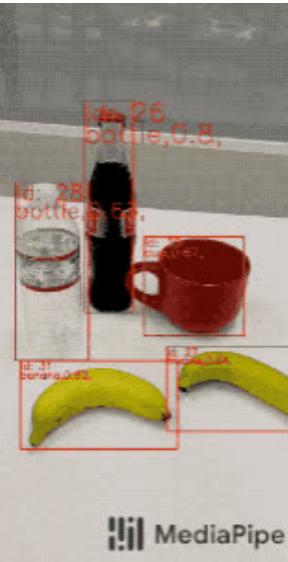
Hair
Segmentation



Object
Detection



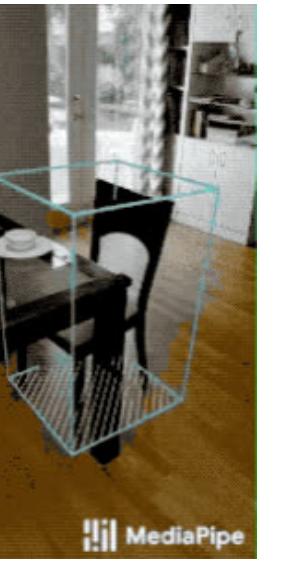
Box Tracking



Instant Motion
Tracking



Objectron



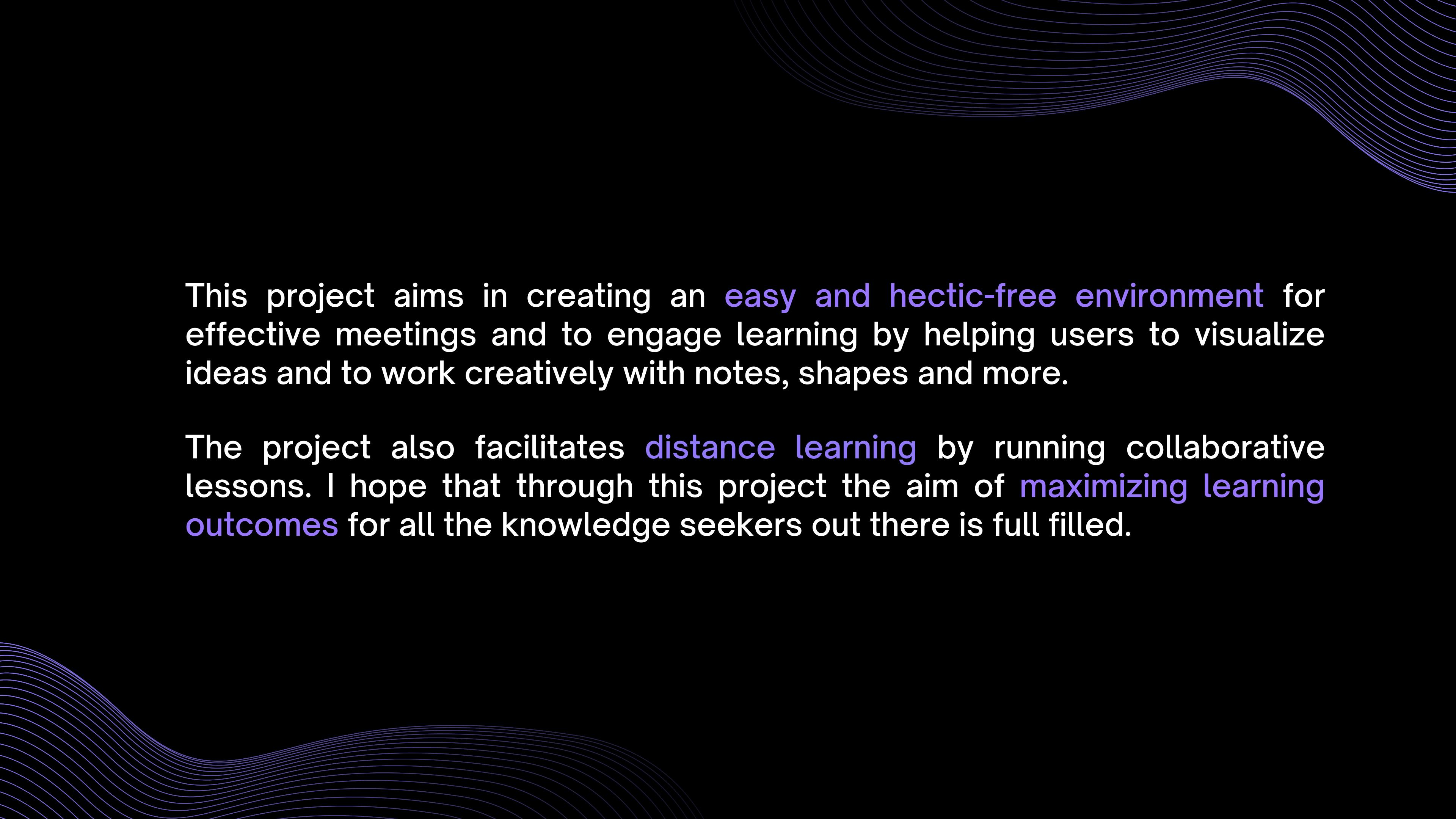
KNIFT



A Computer Vision Project Using GOOGLE MEDIAPIPE

PROJECT IMPLEMENTATION

This project enables computer vision combined with whiteboard software features (Microsoft Whiteboard can be taken as an example) creates a VIRTUAL WHITEBOARD that can be controlled using hand gestures. It allows users to draw images and write notes in thin air using their fingers. Therefore, no stylus or pointing-writing-drawing devices required anymore. All you need is a webcam and your hands.



This project aims in creating an **easy and hectic-free environment** for effective meetings and to engage learning by helping users to visualize ideas and to work creatively with notes, shapes and more.

The project also facilitates **distance learning** by running collaborative lessons. I hope that through this project the aim of **maximizing learning outcomes** for all the knowledge seekers out there is full filled.

Project Update -

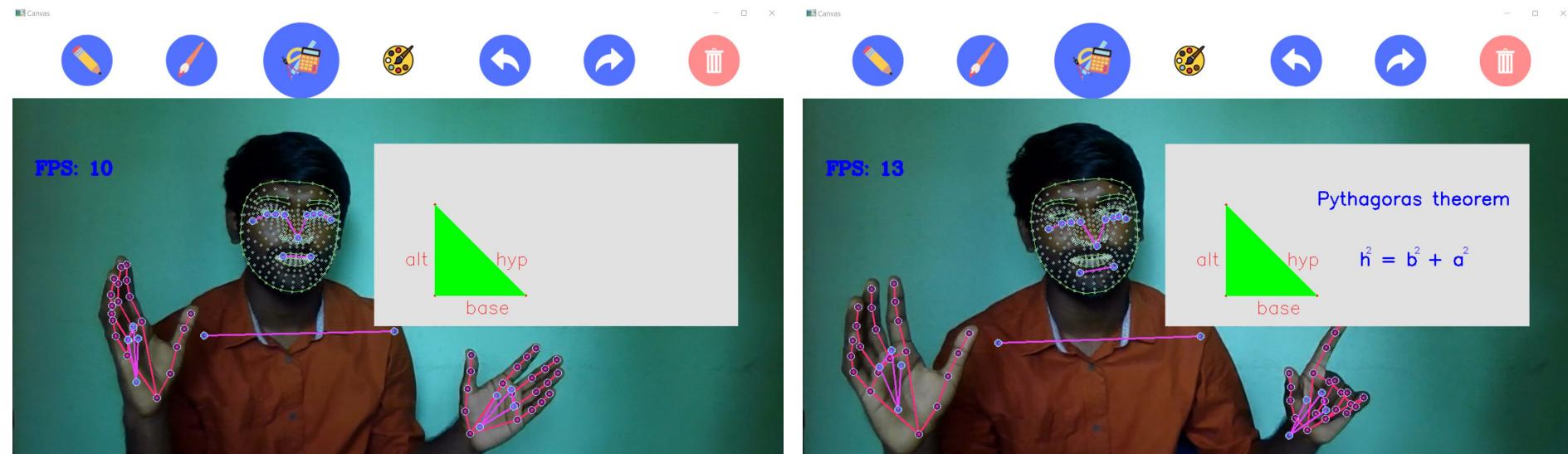
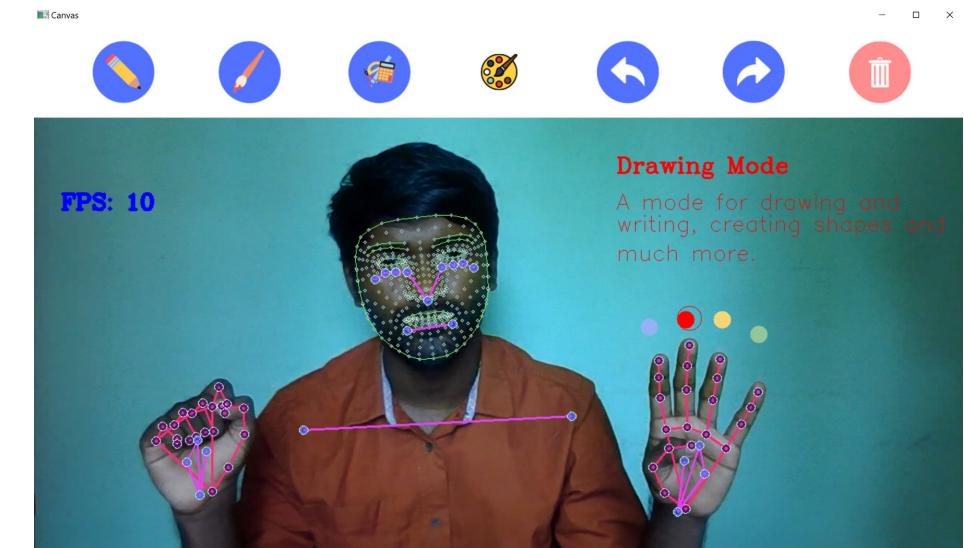
8th Feb 2022

Completed:

1. Passing webcam video to opencv-python package.
2. Using MediaPipe Holistic pipeline, created face, pose and hand landmarks.
3. Created Normal Mode, where no hand gestures are recorded.

Working On:

1. Creating Drawing mode with pen tool, brush tool, shapes tool, undo-redo-delete options.
 2. Creating a menu for changing font size as well as brush size.
 3. Creating a color picker menu.
 4. Creating a shapes menu with circle, triangle, square - rectangle, line
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Thank You . . .

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