Visum Technical Guide

Tech Stack

Python

Media pipe

OpenCV

What is Mediapipe ?

MediaPipe is an Open-Source Library By Google to provides a suite of Solution and tools for you to quickly apply artificial intelligence (AI) and machine learning (ML) techniques in your applications.

What is Open-CV?

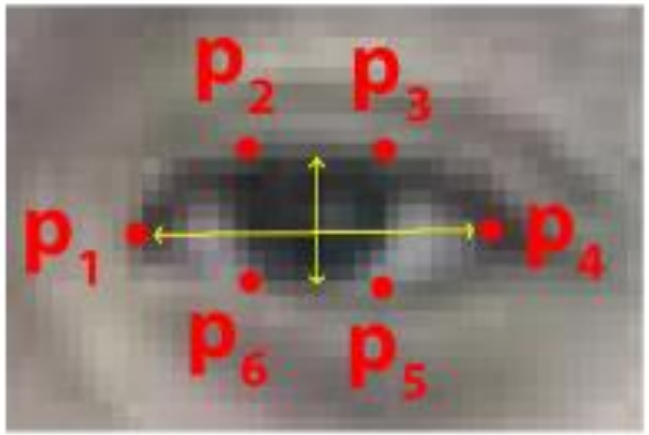
OpenCV is Library to process image in code & deal with Computer Vision

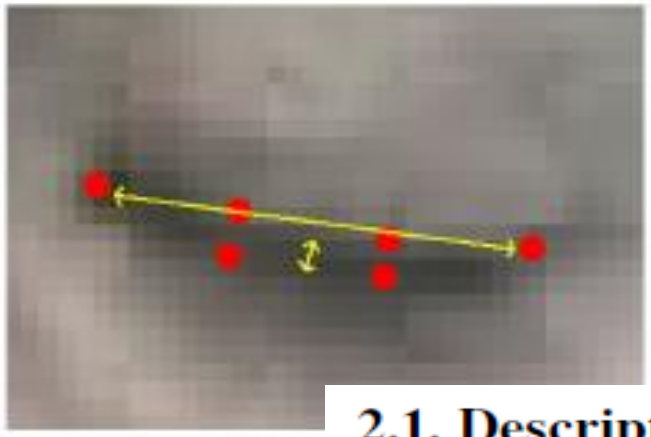
Why Mediapipe ?

It has Facial Landmark Detection

Using Landmark on face we Can Calculate *Eye Aspect Ratio* and Best Way to Find Eye Blink According to Research by *Czech Technical University*

What is Eye Aspect Raito?





Calculates the ratio based on Euclidian distance

6 Landmark Points around Each Eye

2.1. Description of features

For every video frame, the eye landmarks are detected. The eye aspect ratio (EAR) between height and width of the eye is computed.

$$\mathrm{EAR} = \frac{\|p_2 - p_6\| + \|p_3 - p_5\|}{2\|p_1 - p_4\|}, \qquad (1)$$

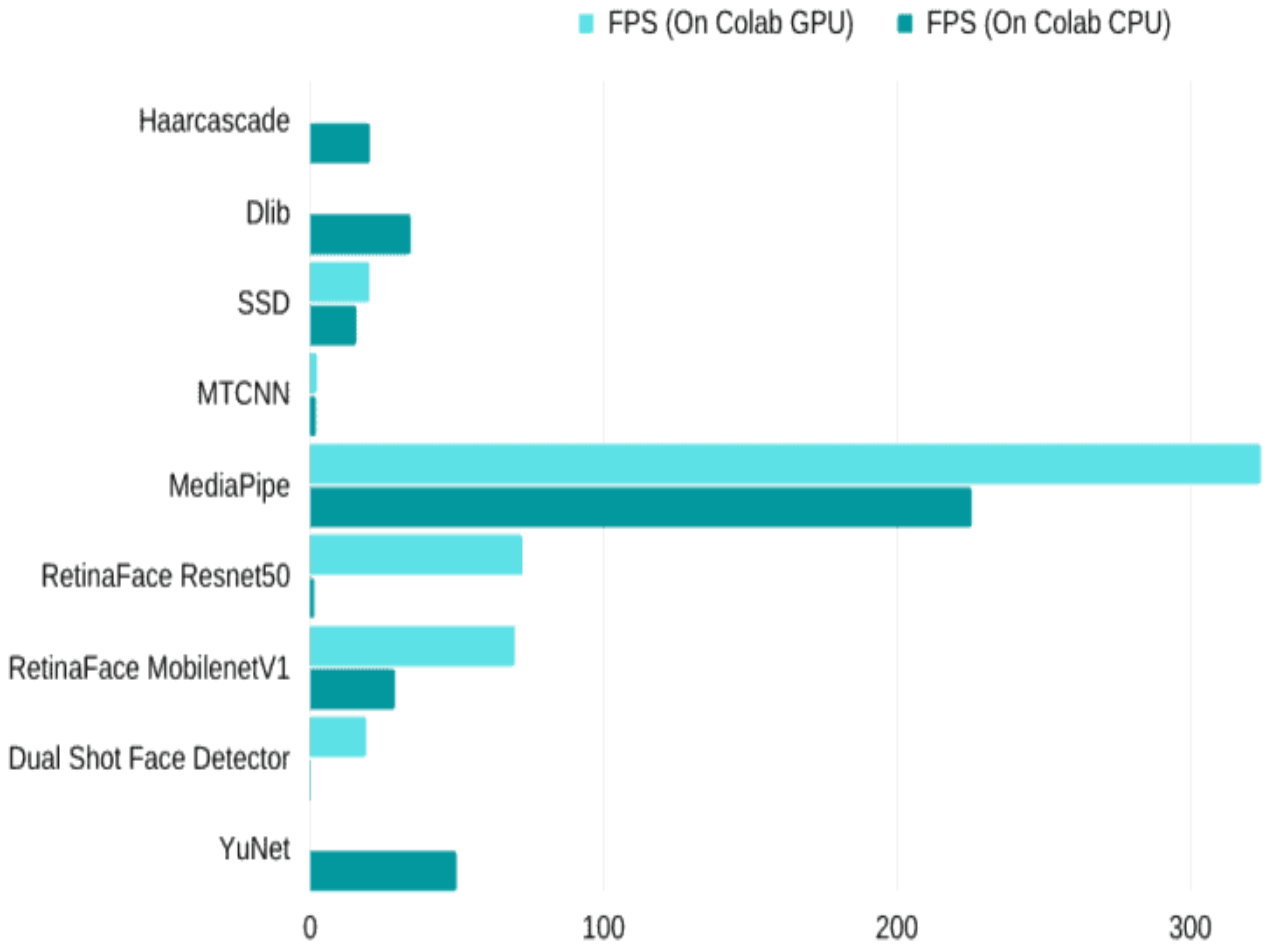
where $p_1, \ldots, p_6$ are the 2D landmark locations, de-

Why Mediapipe Not other Model?

Performance Comparison of Face Detectors (Speed/FPS)

Model	FPS (On Colab GPU)	FPS (On Colab CPU)
Haar cascade	–	19.95
Dlib	–	33.92
SSD	19.90	15.58
MTCNN	2.11	1.81
MediaPipe	323.63	225.34
RetinaFace Resnet50	72.24	1.43
RetinaFace MobilenetV1	69.50	28.89
Dual Shot Face Detector	18.89	0.22
YuNet	–	49.43

Inference Speed



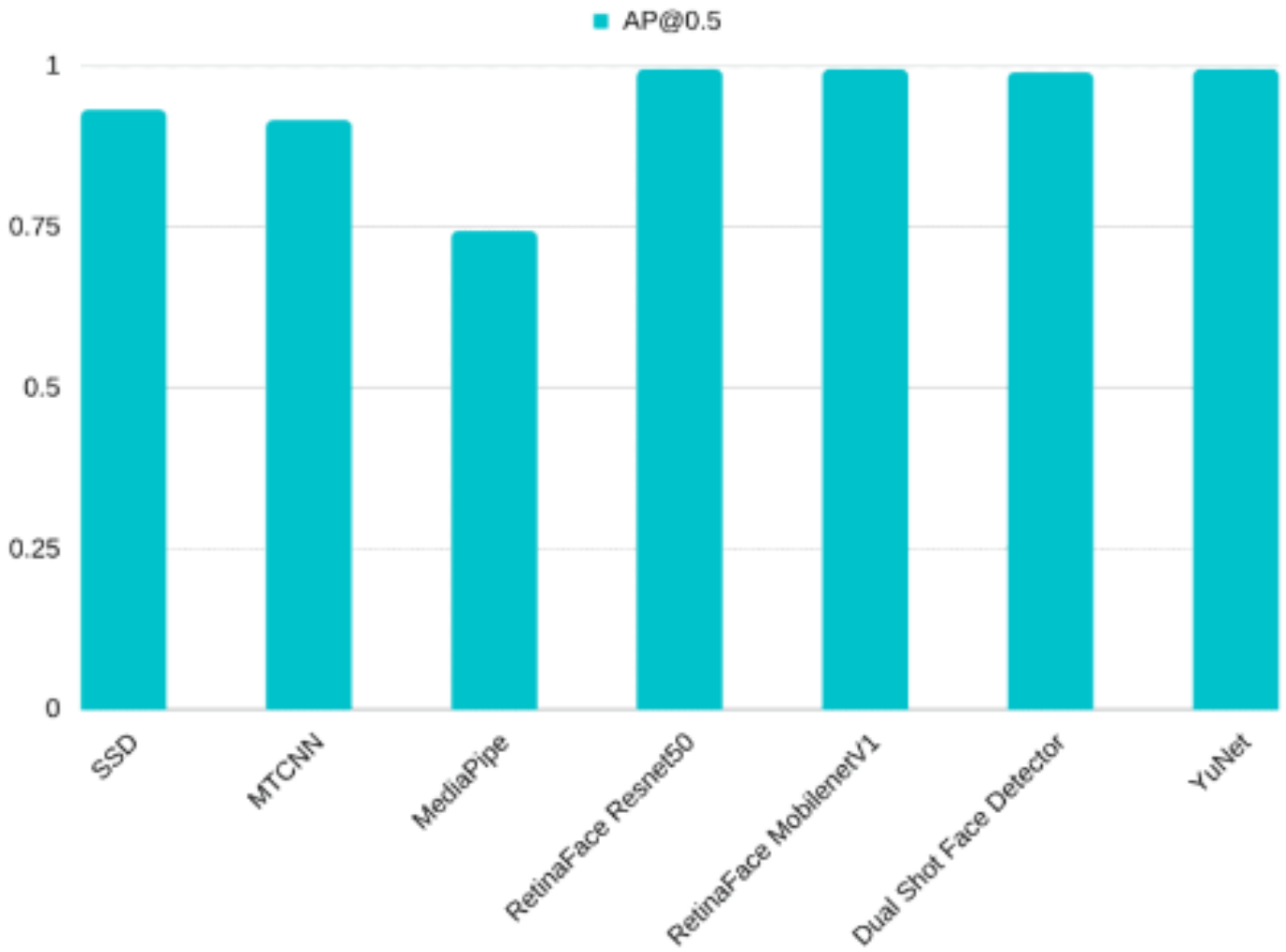
Low Hardware Capable*

Why Mediapipe Not other Model?

Performance Comparison of Face Detectors (Average Precision)

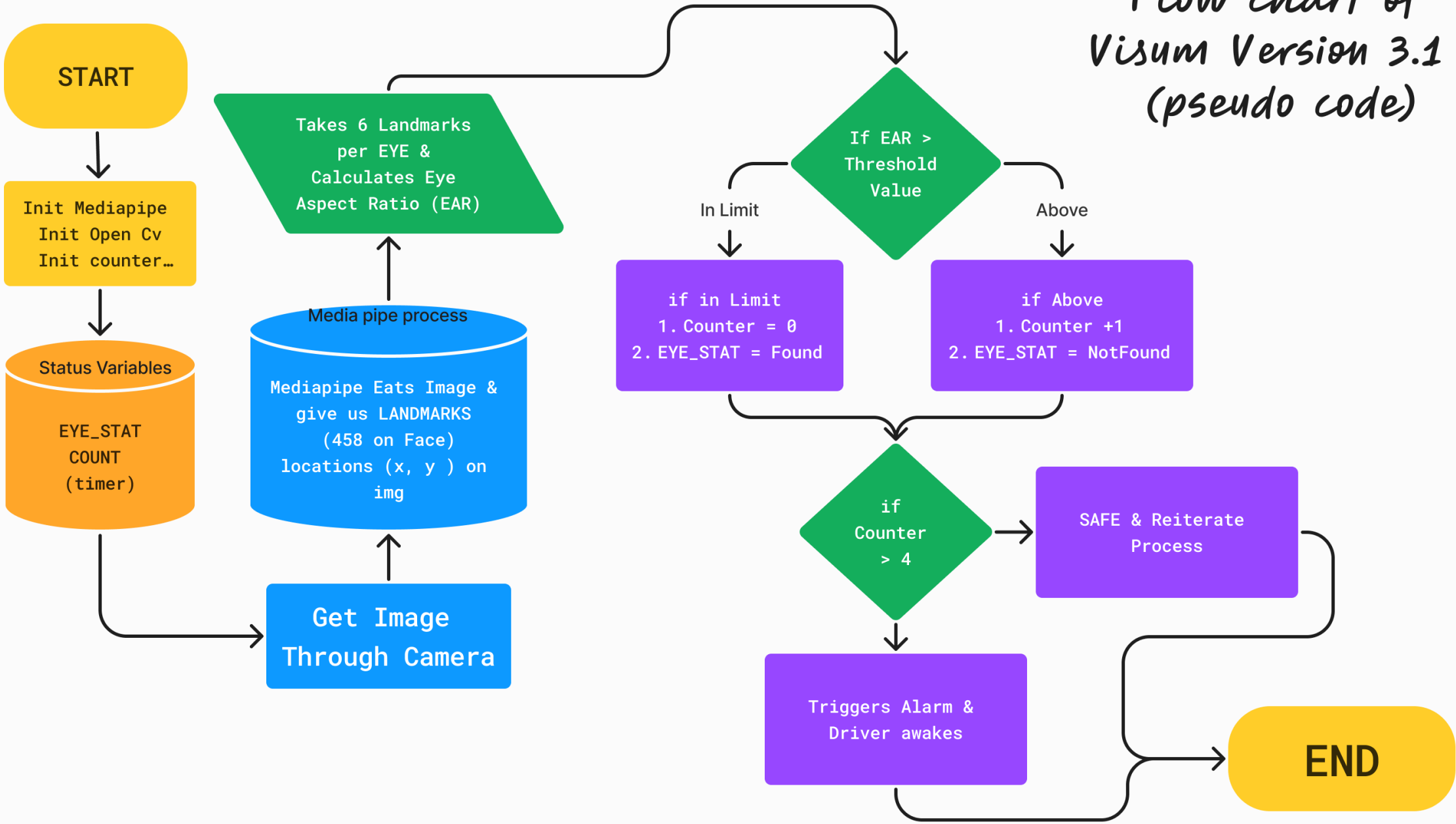
Model	AP@0.5
SSD	0.931
MTCNN	0.915
MediaPipe	0.743
RetinaFace Resnet50	0.994
RetinaFace MobilenetV1	0.994
Dual Shot Face Detector	0.989
YuNet	0.994

Model Performance



Good AP Rating @ 0.5 confidence

Flow chart of Visum Version 3.1 (pseudo code)



It’s Not a Bug .. It’s an Undocumented Feature @.@

Anonymous

Team Visum

Thank you