



# AFFORDABLE DRONE

**NTT & OPS & Fabcafe**





Source: Bangkok Post

# Ranking

# News

# Resources



7 Apr 2023, 08:00 AM



#	MAJOR CITY	US AQI
1	 Chiang Mai, Thailand	341
2	 Karachi, Pakistan	175
3	 Shanghai, China	164
4	 Lahore, Pakistan	163
5	 Dubai, United Arab Emirates	159
6	 Kathmandu, Nepal	154
7	 Astana, Kazakhstan	154
8	 Dhaka, Bangladesh	153

## World AQI Ranking

16:15, Mar 12

MAJOR CITY

US AQI

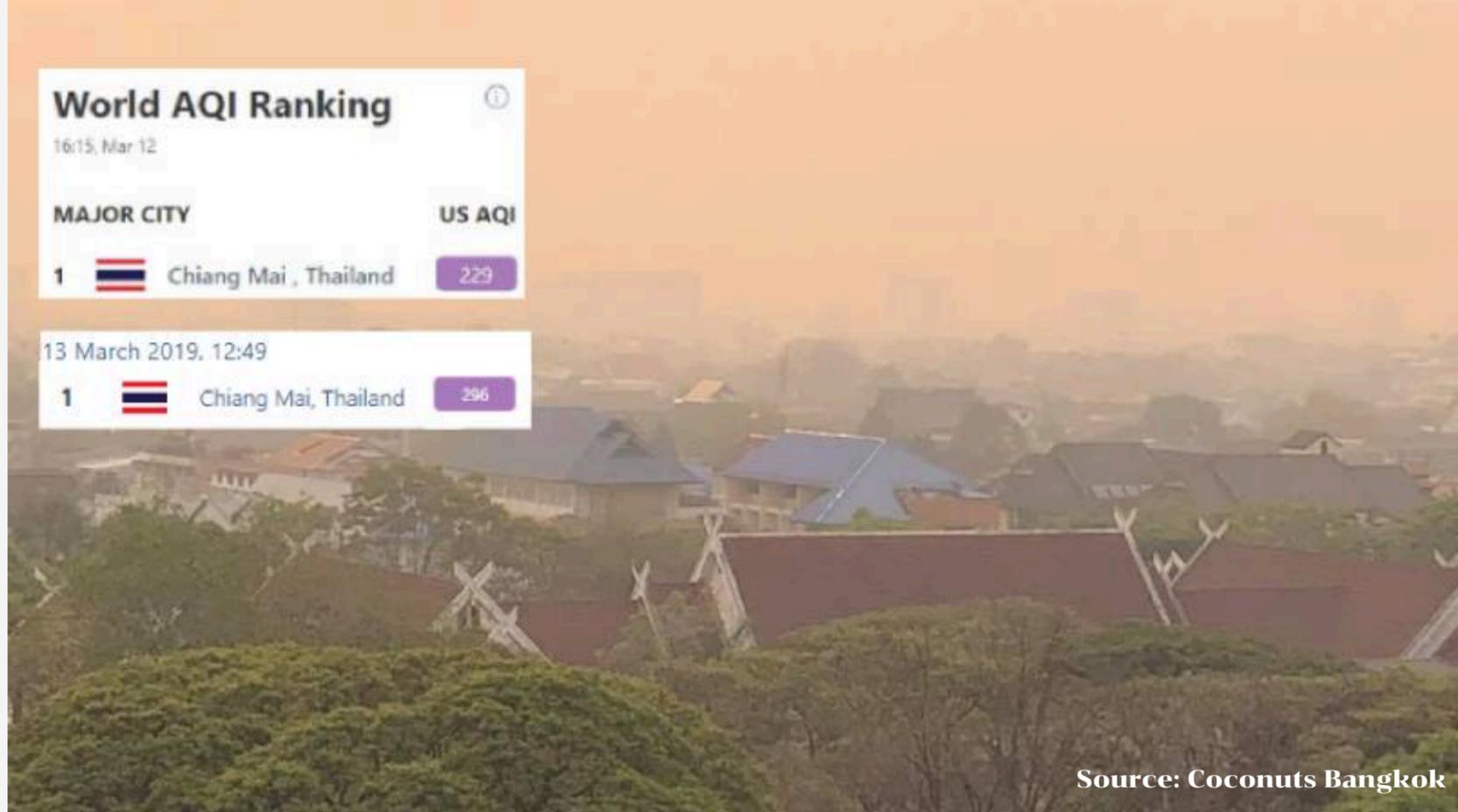
1  Chiang Mai, Thailand

229

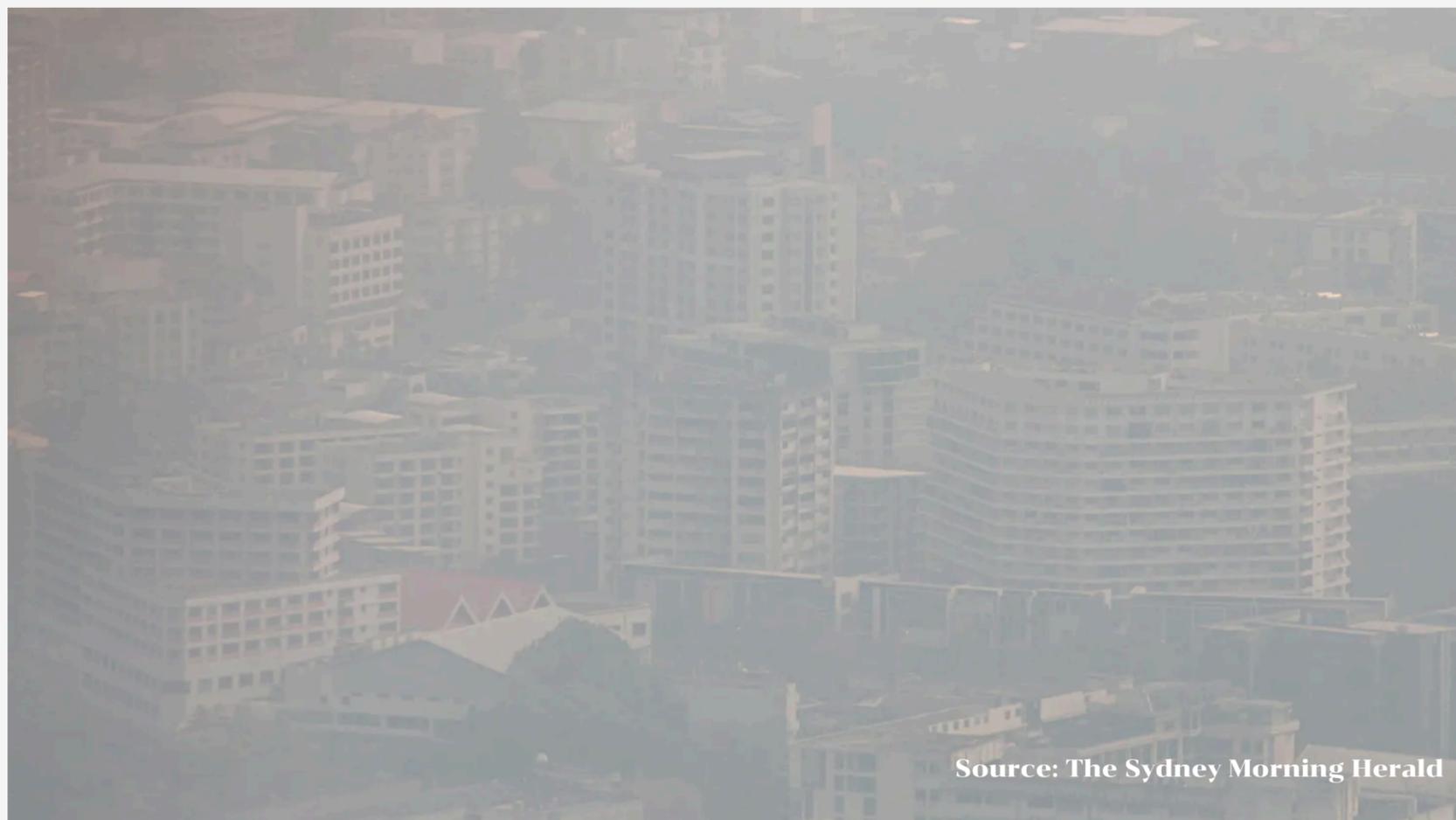
13 March 2019, 12:49

1  Chiang Mai, Thailand

296



Source: Coconuts Bangkok



Source: The Sydney Morning Herald





Source: Prachachat



Source: MGR online

# OUR MISSIONS

## Fire Detection



**Faster, More efficient**

## Human Detection



**Reduce loss of life**

## Affordable



**Minimal costs, efficient flights**

# PHASES

## Phase 1 Prototype

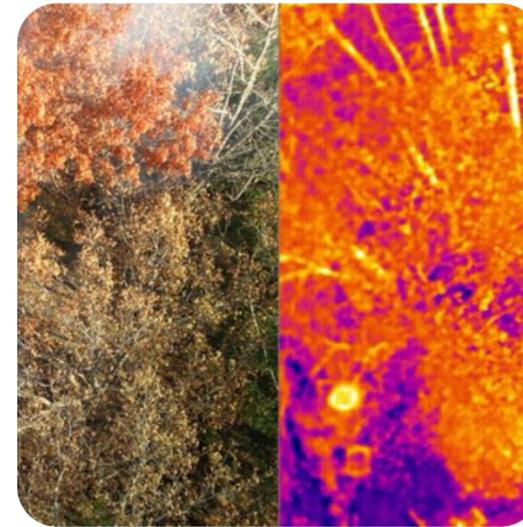


Source: copilot

## Phase 2 Autonomous

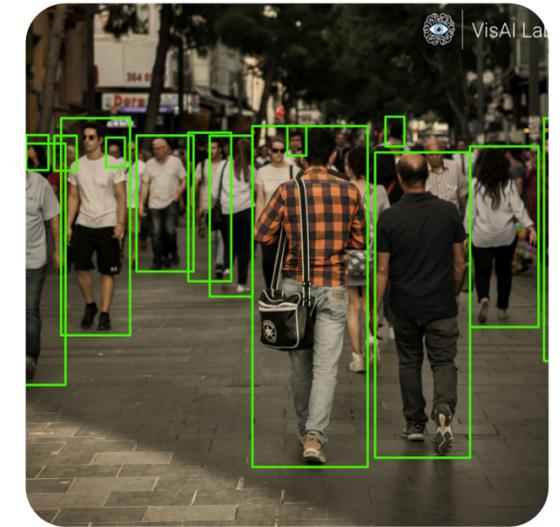


## Phase 3 Thermal Imaging



Source: miragenews

## Phase 4 Human Detection



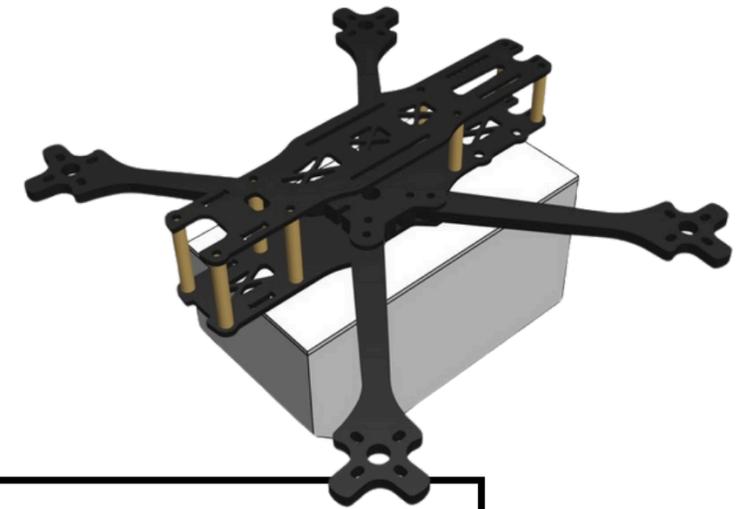
source: visailabs

# GENERAL DRONE PROBLEM

- **Maximum Payload is less than 200 g.**
- **Not stable when carrying heavy load.**
- **Costly**
- **Less function**
- **No data analysis**



# AFFORDABLE DRONE



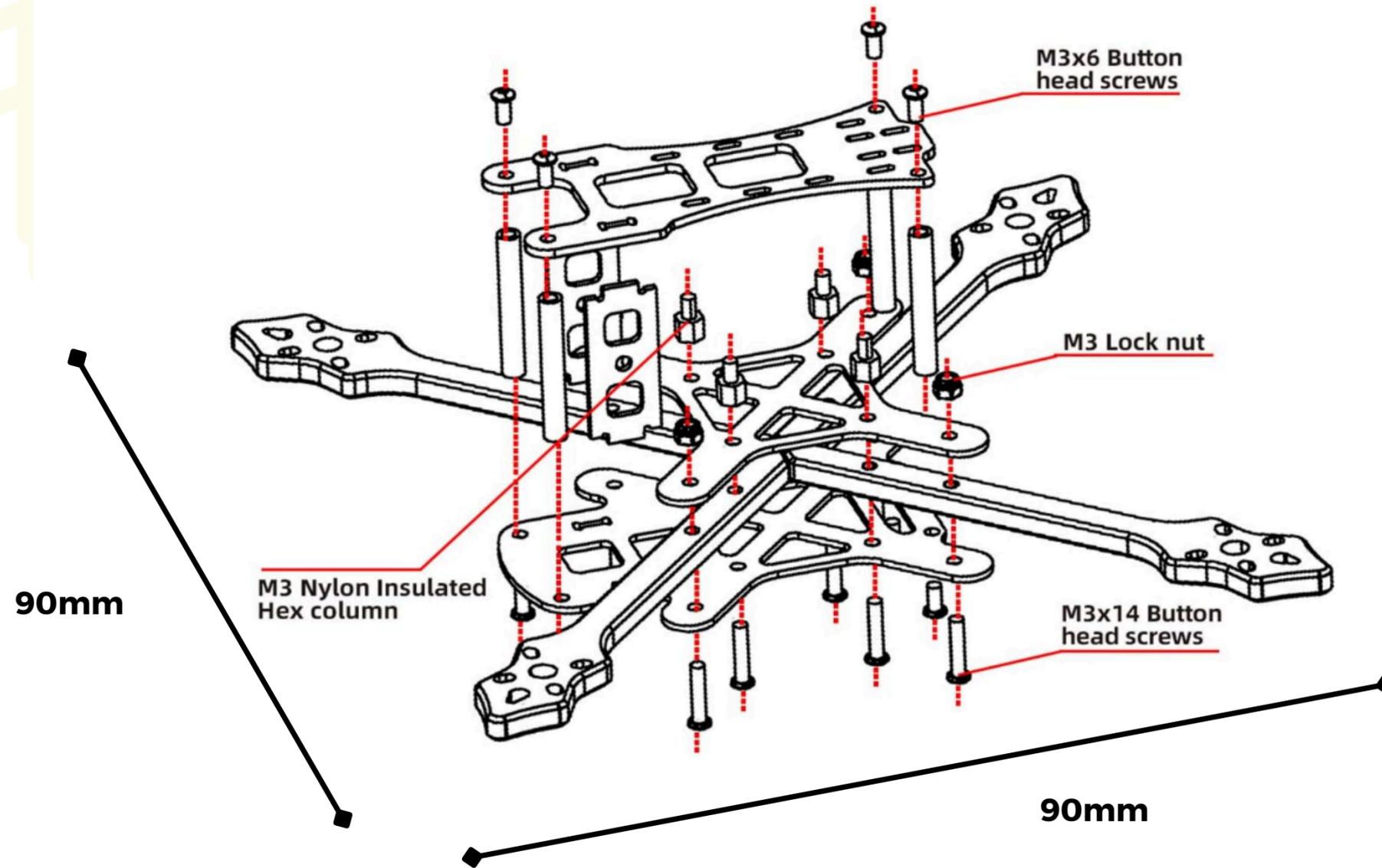
	<b>General drone</b>	<b>Affordable drone</b>
<b>Hardware</b>	Maximum flight time is 45 minutes.	Can fly for more than 45 minutes. You can adjust various functions on the board.
<b>Software</b>	Focus on video recording features	automatic flight system Data processing system Wildfire and people detection system
<b>Total price</b>	<b>187,000฿</b>	<b>19,803฿</b>

# ADVANTAGE

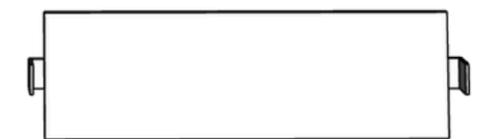
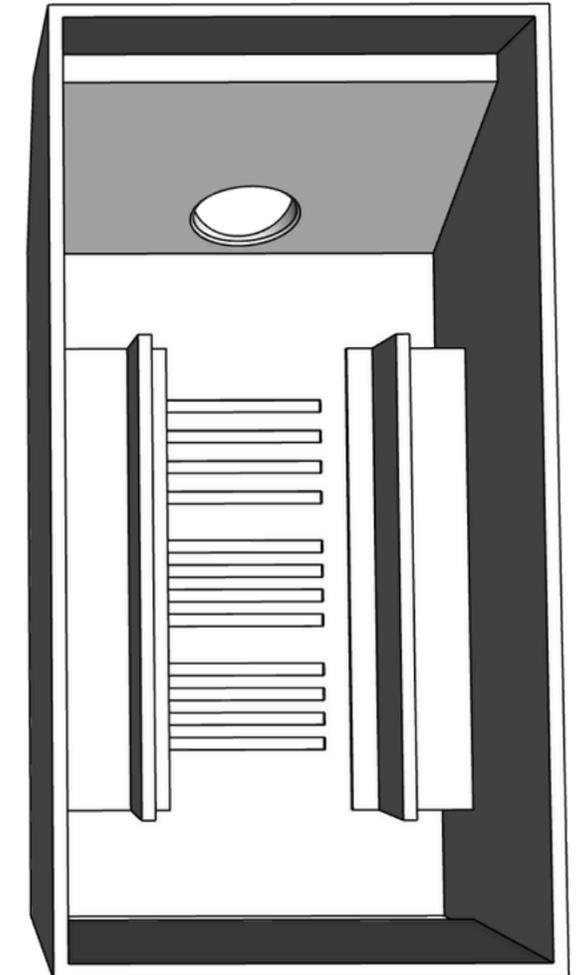
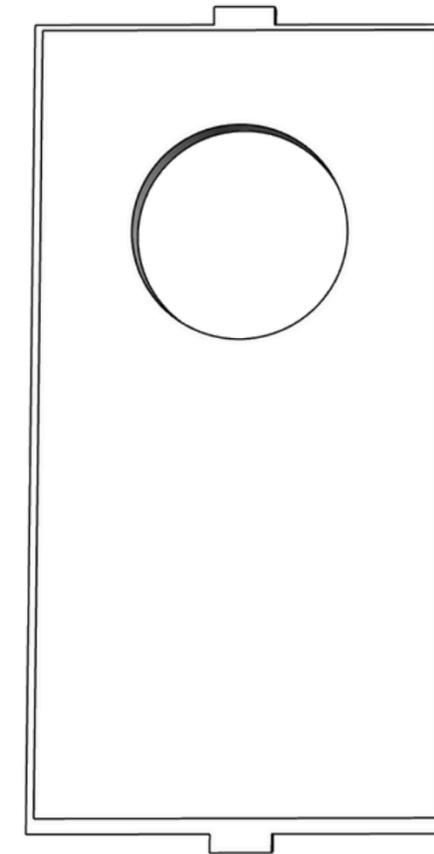
- **CAN CARRY A LOT OF WEIGHT**
- **CHEAP PRICE**
- **SMALL SIZE**
- **FAST**
- **LIGHT WEIGHT**



# DIMENSION



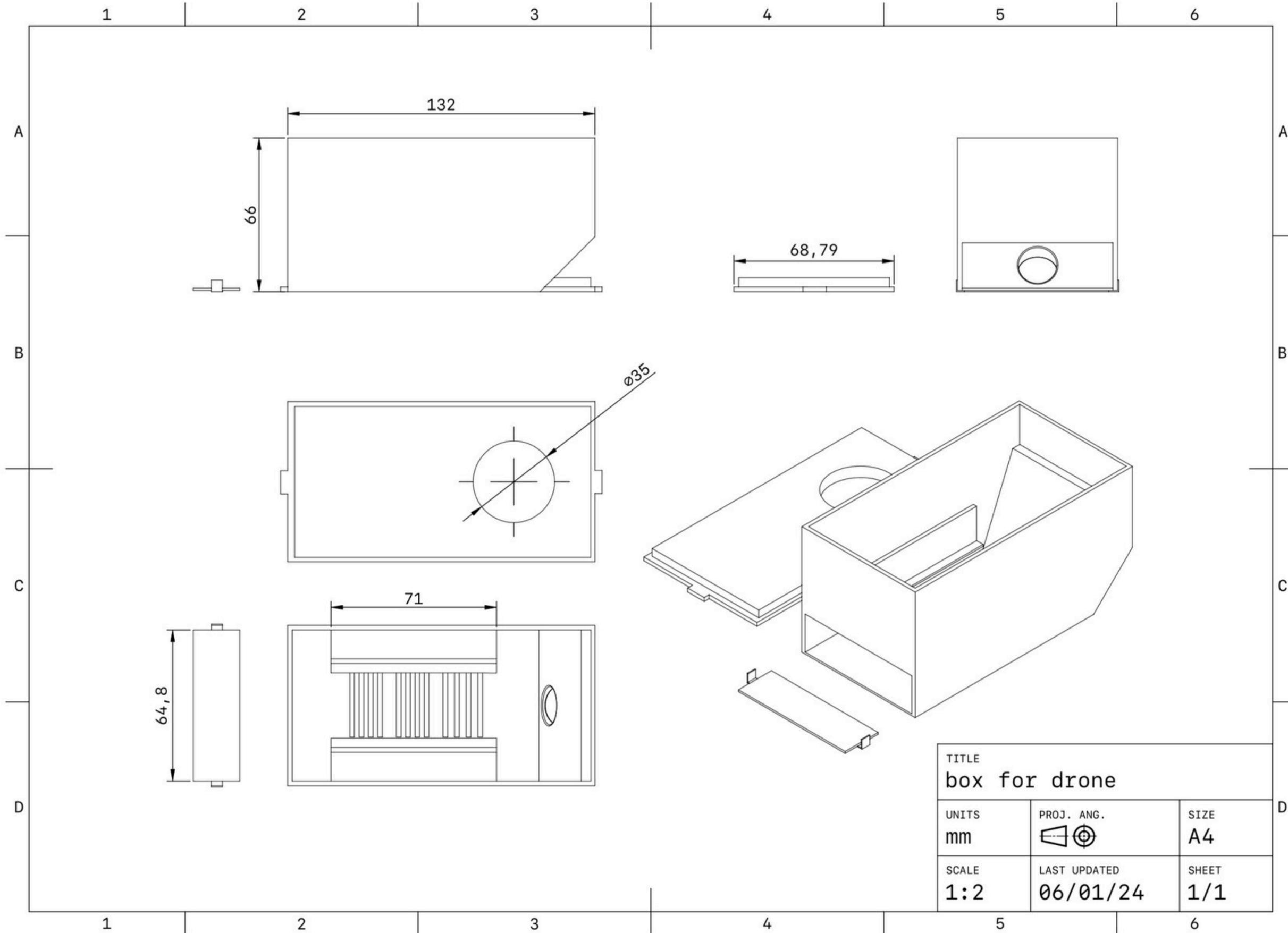
# HARDWARE BOX



**-lightweight box that can hold a board, camera, and battery.**

**-The box will have ventilation holes on the sides to address heat issues.**

**-A shelf will separate the board and battery for clear division, with the board placed at the back for easy installation.**



TITLE box for drone		
UNITS mm	PROJ. ANG. 	SIZE A4
SCALE 1:2	LAST UPDATED 06/01/24	SHEET 1/1



# MATERIAL

Material	Weight	Strength	Cost	Durability
Carbon Fiber	Extremely lightweight	Very high	High	High
Aluminum	Lightweight	High	Moderate	High
ABS	Moderate	Moderate	Low	Moderate
Wood	Heavy	Low to Moderate	Low	Low



# **HARDWARE**



## Drone with container



**IFlight TITAN XL5**  
FPV Drone

## Hardware



**Raspberry Pi**  
Single Board Computer



**OpenMV Cam H7 Plus**  
microcontroller board  
with high Resolution Cam



**Li-Po GNB 4S 16.8V 1350MAh**  
Battery

## Software and language

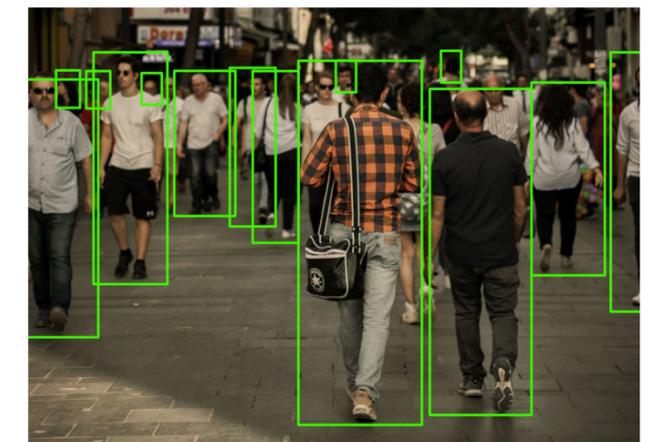


**Machine Vision**  
Detect Wildfire and human

## Result

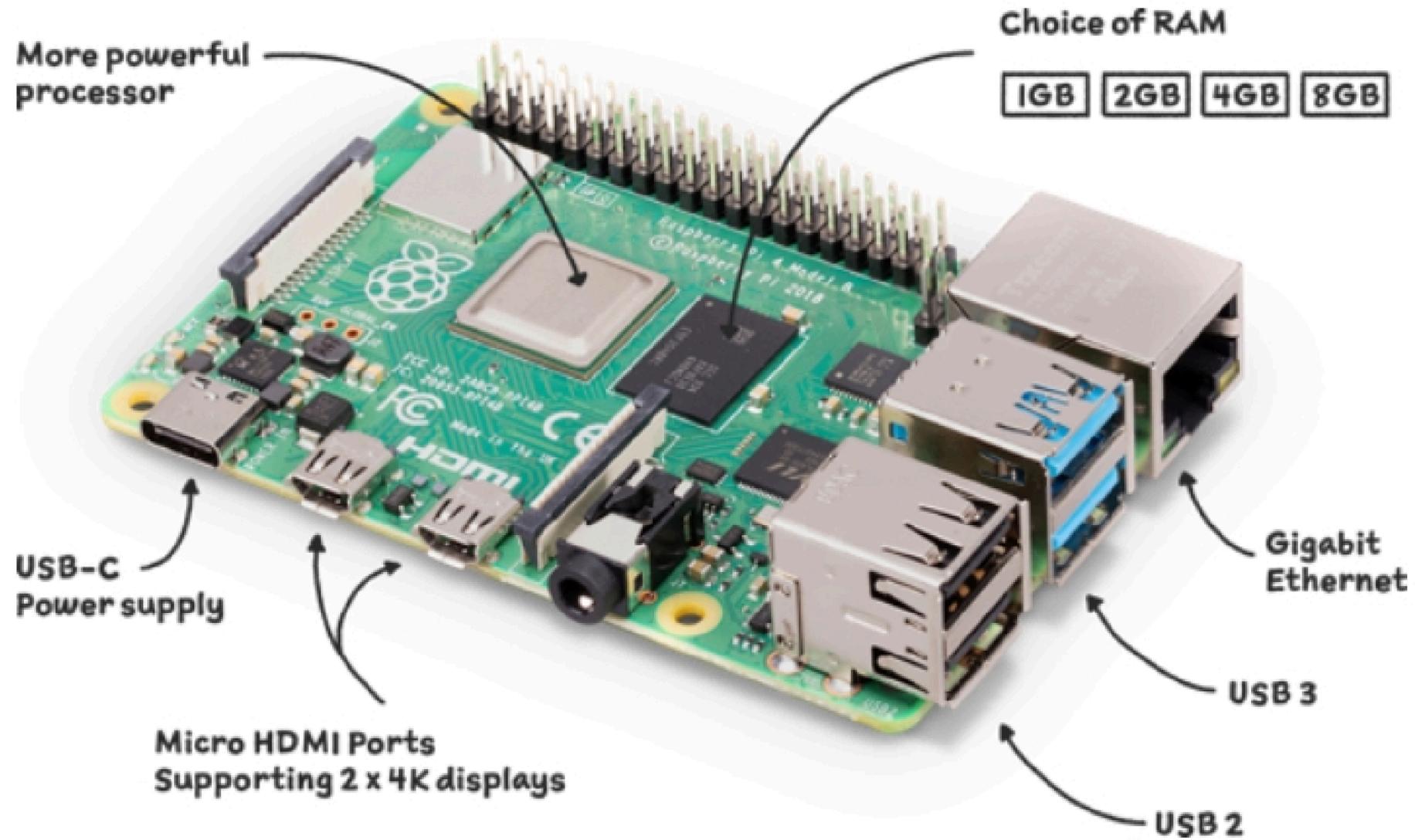


**Detect Wildfire**  
Image Processing

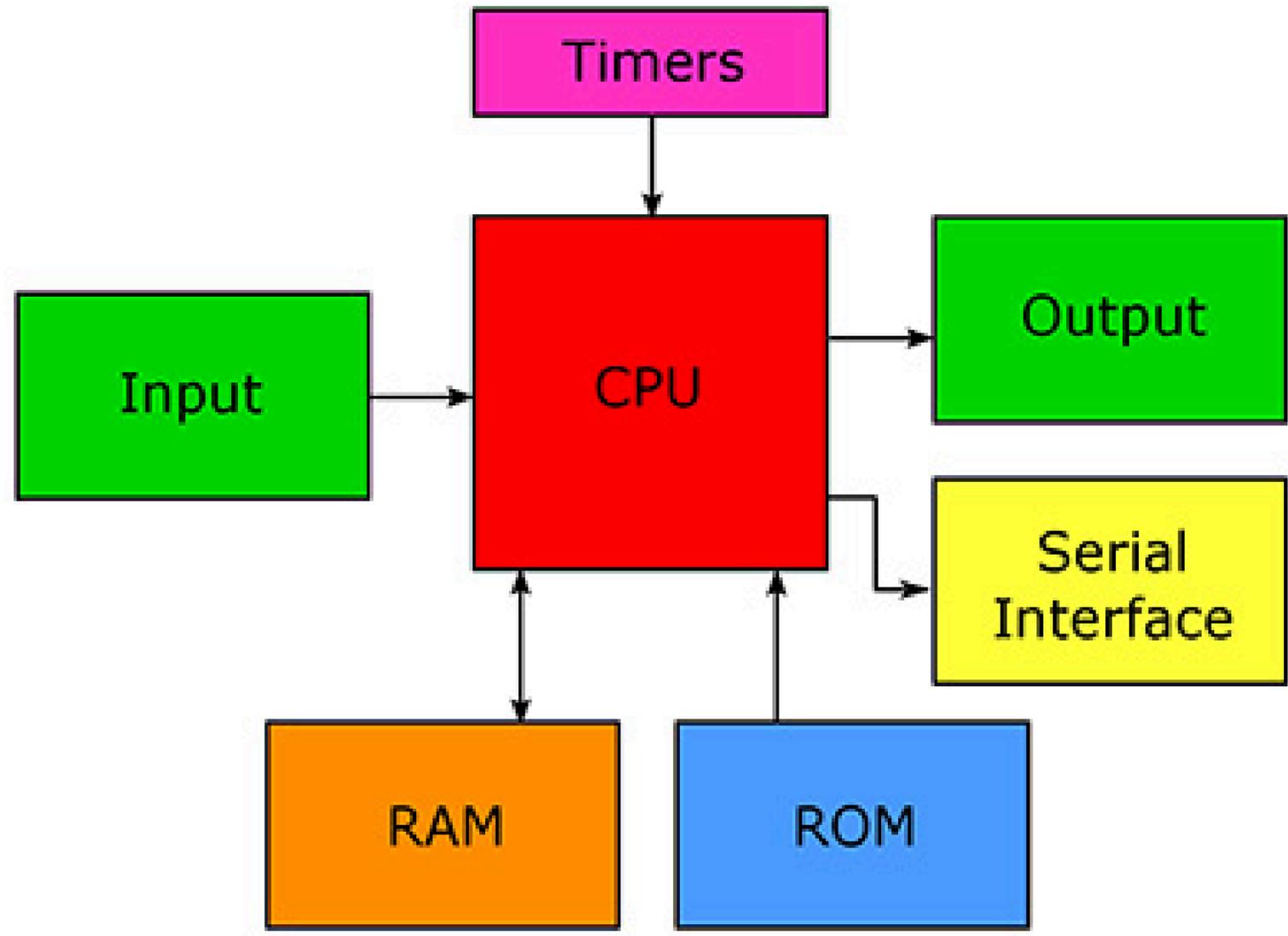


**Detect Human**  
Image Processing

# RASPBERRY PI 5



Microprocessor: CPU and several supporting chips.



Microcontroller: CPU on a single chip.

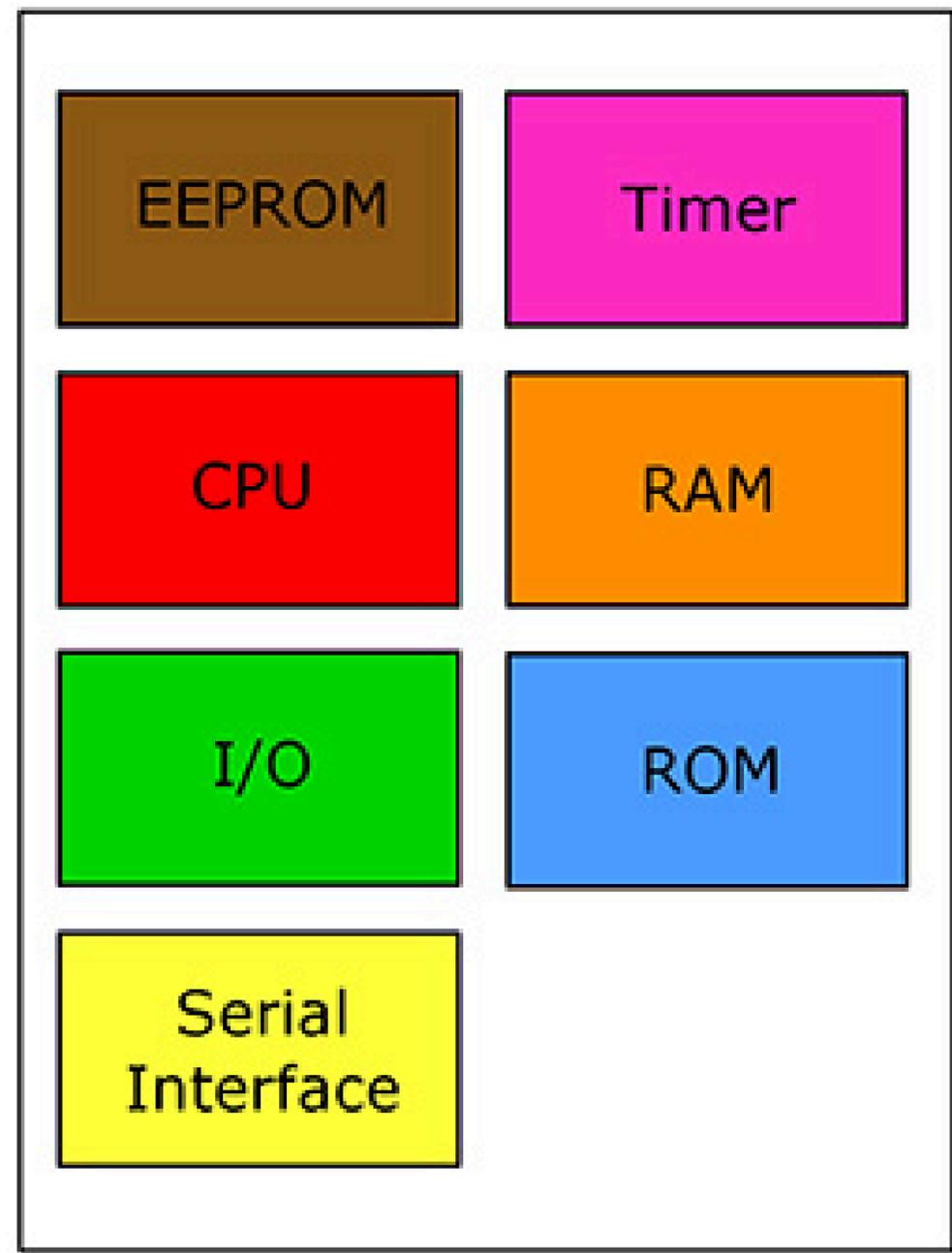
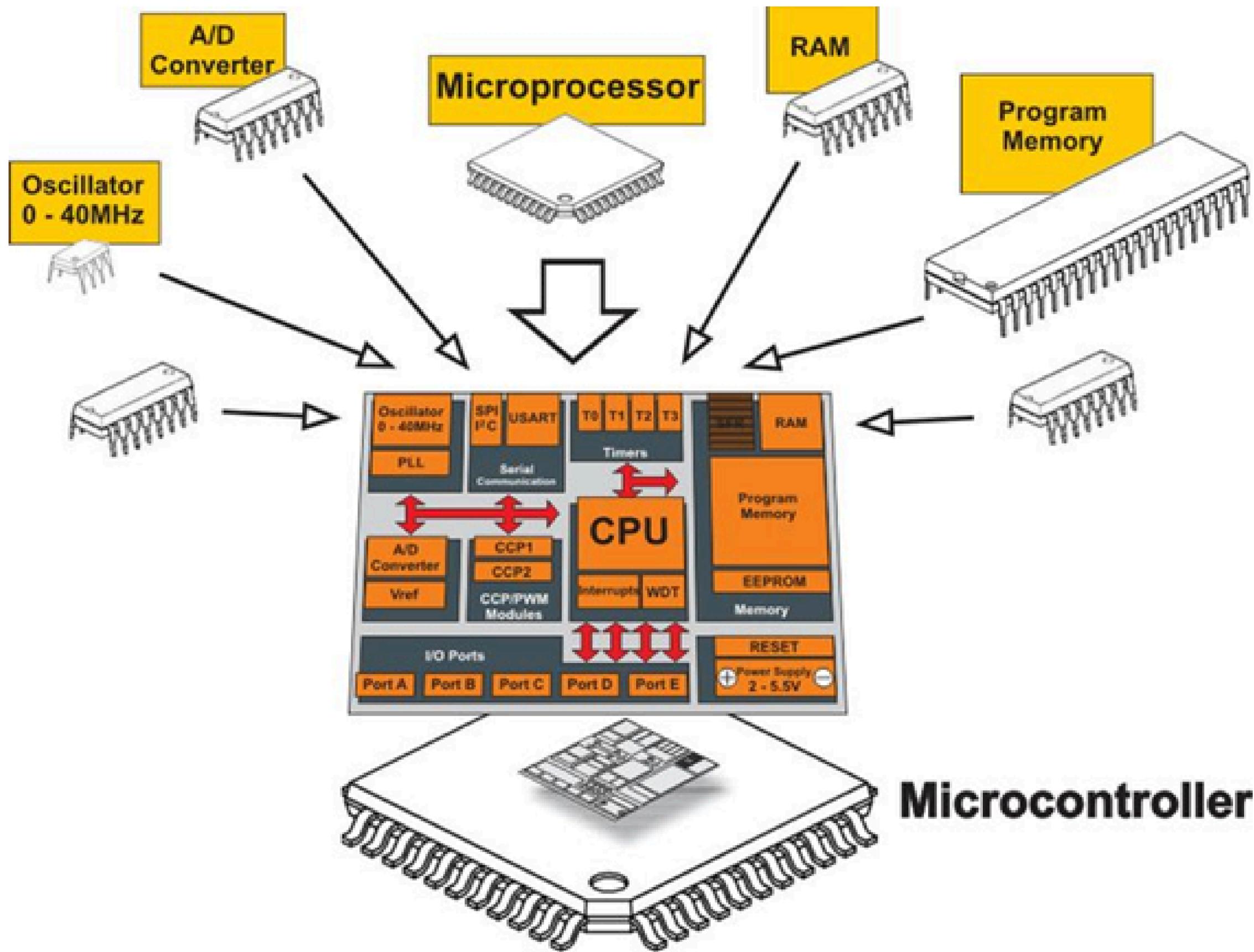
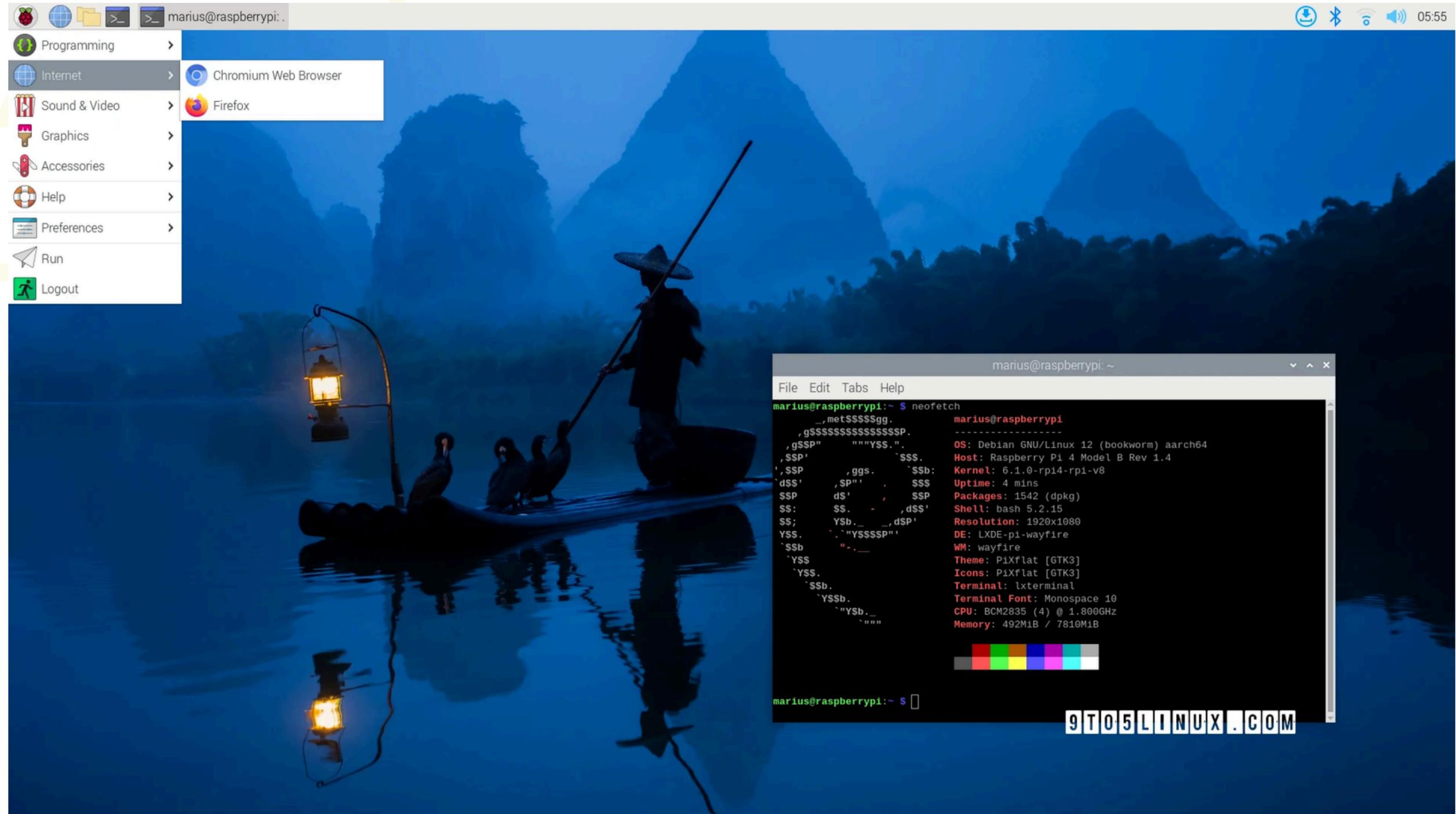


Image Credit: Kenneth C. Reule, III



**Microcontroller**

# RASPBERRY PI 5 OS



# HARDWARE (CAMERA)



	<b>Pixy2 CMUcam5</b>	<b>Arduino Portenta Vision Shield</b>	<b>Raspberry Pi Camera Module 3</b>	<b>OpenMV Cam H7 Plus</b>
<b>Ease of Use</b>	more specialized for object tracking	Requires familiarity with the Arduino	more complex programming.	experts alike to develop machine vision applications.
<b>Capabilities</b>	less for general-purpose vision tasks.	depends heavily on the capabilities of the Portenta H7 board	may require additional hardware.	powerful ARM Cortex M7 processor
<b>Application Range</b>	object tracking but less versatile for other types of vision tasks.	typically tied to the specific needs and limitations	requires more extensive setup and additional software	it is suitable for a wide range of applications from robotics to IoT.
<b>Integration</b>	Strong community support but more niche.	may not be as extensive as OpenMV's.	integration can be more complex and time-consuming.	easier integration into various projects.

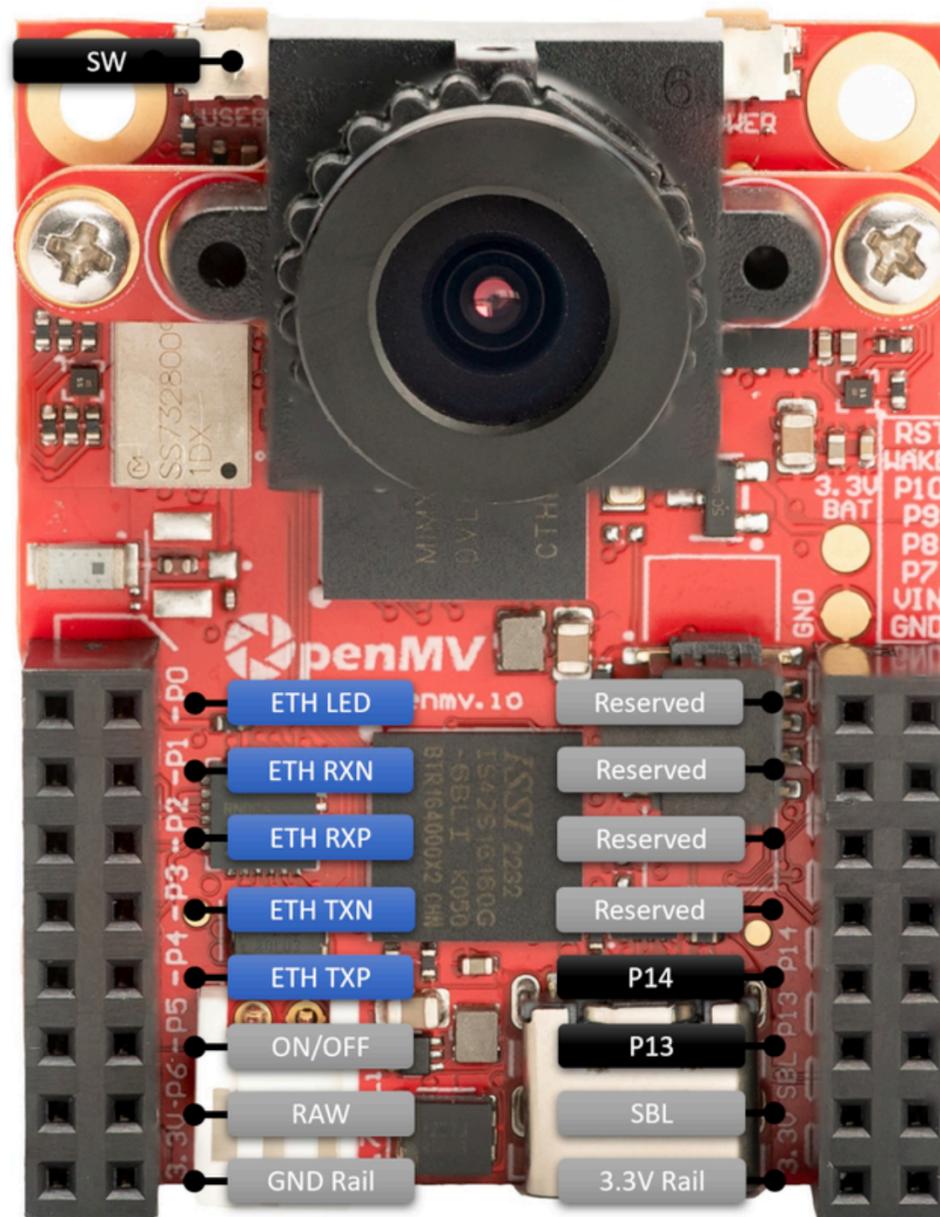
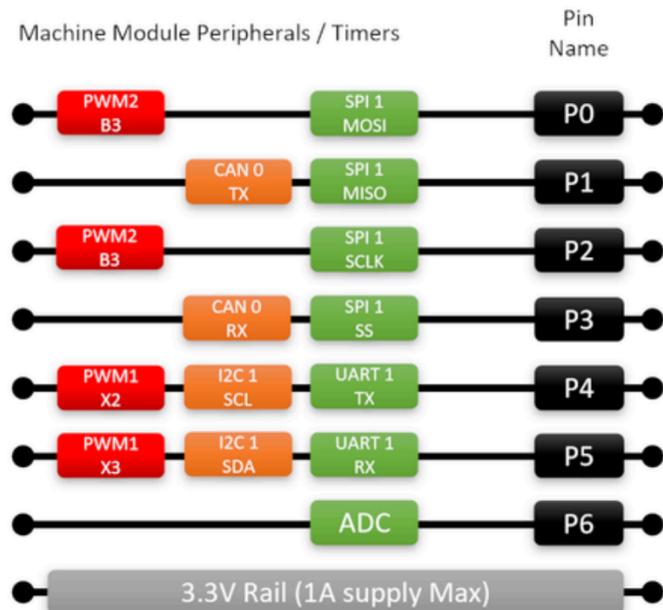
# OPENMV H7 PLUS



By: Ibrahim Abdelkader & Kwabena W. Agyeman  
<https://openmv.io>

RAW provides always-on unregulated (3.6V-5V) power in on/off or deepsleep modes.

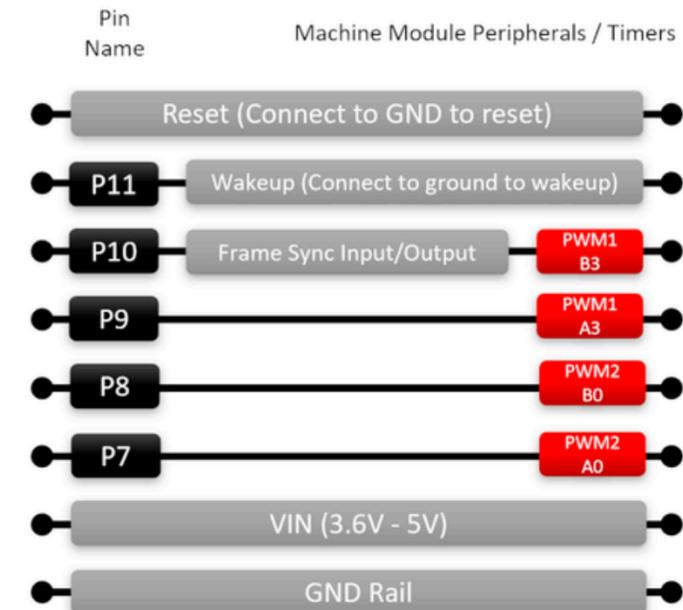
Connect SBL to 3.3V to put the board into recovery mode to reflash the bootloader.



All pins are 3.3V tolerant with a 3.3V output  
 All pins can sink or source up to 4 mA

On/Off (or Power Button):  
 \* Pull low for 5 seconds to turn off when on  
 \* Pull low for 1 second to turn on when off  
 Wake:  
 \* Pull low to wakeup in deepsleep (not off).

Micro SD Slot  
 SD < 2GB Max  
 SDHC < 32GB Max  
 SDXC < 2TB Max



# PROCESS



**MicroPython**

**Machine Vision**  
Detect Wildfire and human



**SMS**



**!!!**

**Notification**  
Send response to  
server or phone by WIFI



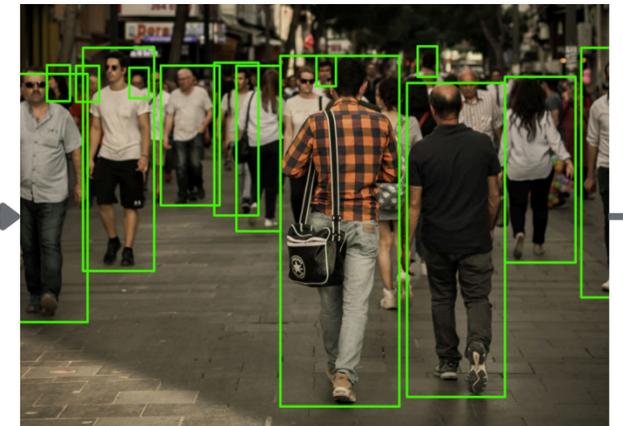
**Raspberry Pi**  
Single Board  
Computer



**OpenMV Cam H7 Plus**  
High-Resolution Cam



**Detect Wildfire**  
Image Processing



**Detect Human**  
Image Processing

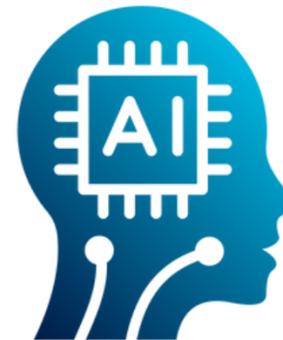
Send Response

# PHASE 2

## Automation



- **GPS** : Accurately pinpoint the location.



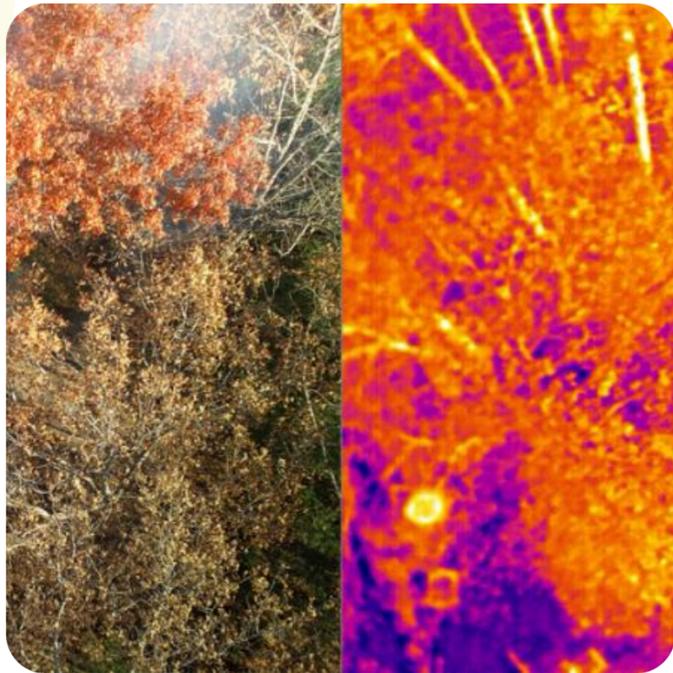
- **Basic AI Model** : Use the drone to analyse images immediately.



- **Remote Monitoring and Alert System**: Send SMS

# PHASE 3

## Thermal Imaging



- **Thermal Imaging** : Detect heat more effectively, making it easier to spot fires in smoke or darkness.

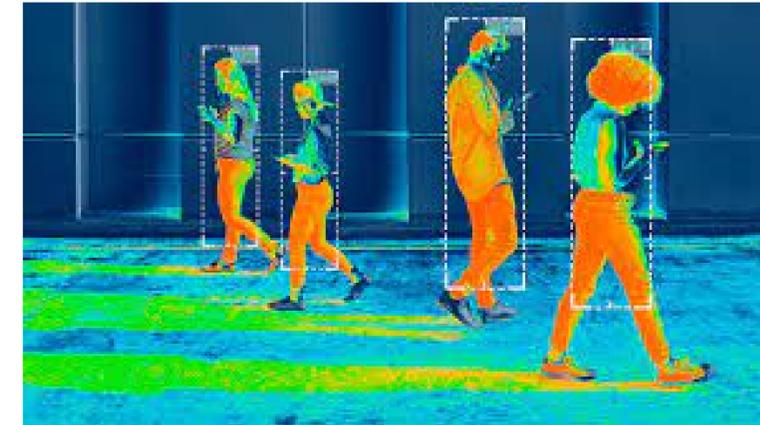
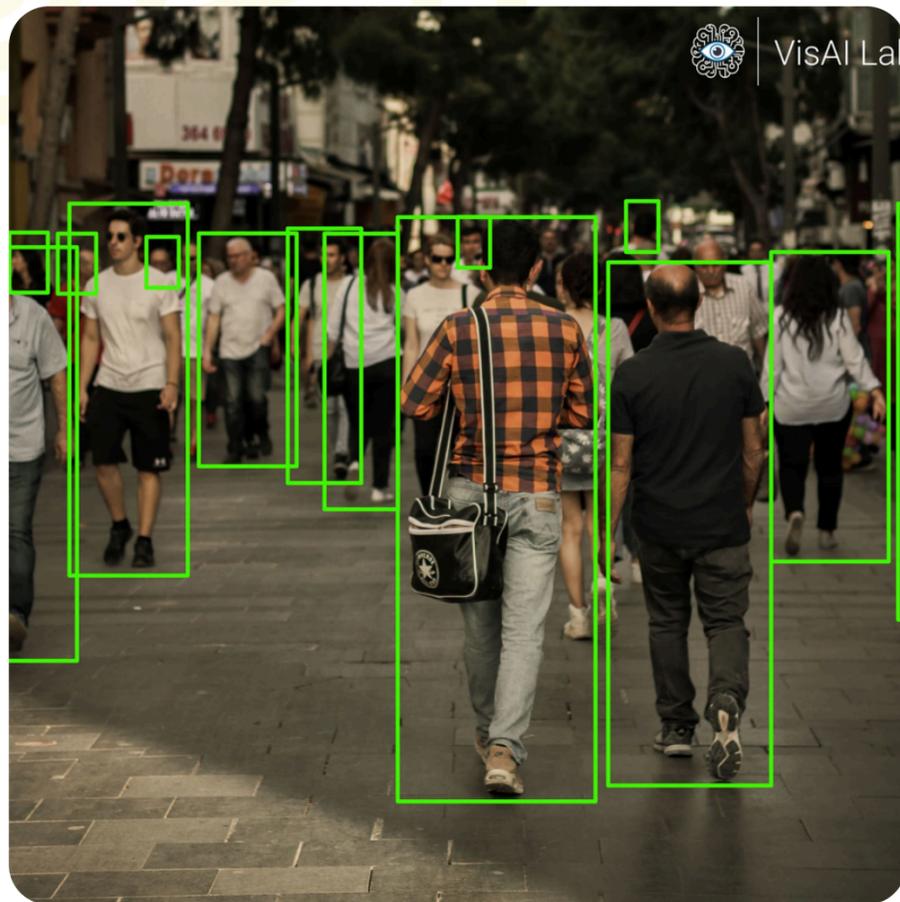


- **Advanced AI model** : Improve accuracy



# PHASE 4

## Human Detection



**Human Detection :** Train the system to recognize human presence



To find Human in forest

# MARKET PRICE



**฿19,803\***



**฿12,463.83\***

**37%**  
**cheaper**

\*price per one Drone with same spec

# OUR TEAM

**ALICE**  
PROJECT LEADER

**BOSS**  
ENGINEERING MANAGER

**EARN**  
ENGINEERING NOTEBOOK MANAGER

**TONMAI**  
HARDWARE ENGINEER

**ZEETOS**  
SOFTWARE ENGINEER

**FIRST**  
GRAPHIC DESIGNER

**TREE**  
TREE

**WAIT  
TONMAI  
CLIP**