



**WELCOME**



# Weapon Detection using Artificial Intelligence and Deep Learning for Security Applications Levels

Group Membersname :Ajay Das K, Muhammed Safeer T,  
Najmudheen Kp,fathima C  
Register Number: CCV19CS002, CCV19CS016, CCV19CS018,  
CCV19CS006  
Class : S6 CSE  
Area of seminar: Ai Vision  
Guide name : Mrs. Sruthy Das  
Assistant Professor (CSE Dept)  
MGM College of Engineering  
Date Of Submission :24/05/2022



# TABLE OF CONTENTS



**01**

**INTRODUCTION**

**02**

**LITERATURE  
SURVEY**

**03**

**PROPOSED  
SYSTEM**

**04**

**SYSTEM  
REQUIREMENTS**

**05**

**EXPECTED  
OUTCOME**

**06**


**REFERENCE**





# 01. INTRODUCTION



- Deep learning- based approach is used to solve the problem of object detection in an end-to-end fashion.
  - Incorporate state-of-the-art technique for detecting the object placed in front of the webcam with the goal of achieving high accuracy with a real-time performance using deep learning
  - Based on the detected image several preprogrammed robots are used to transport the object in the detected image from the place where humans cannot work flawlessly to the desired location efficiently.
  - Deep learning and robotics which can be used in militry and also use several areas such as mines, construction sites, steel factories etc where human works in a risky environment.
- 

## 02. LITERATURE SURVEY

TOPIC	PUBLICATION YEAR	FEATURES	PROS	CONS
Automation using Machine Learning and Object Detection	NTASU - 2020 Conference Proceedings	Machine Learning, object detection, Single shot detection, automation, robotics.	which can be used ,where human works in a risky environment	Chances of lost connectivity
Development of Tools and Strategies for Rover Vehicle Design	Vol. 7 Issue 02, February-2018	Rover Design, Genetic Algorithm, Rover System Modelling, Computational Tool Development	For designing to suitable user defined objectives, these models when integrated with Genetic Algorithm form an effective tool to support rapid design trade-offs during conceptual design process. This integrated modeling and optimization approach is thought to be efficient in identifying rover system concepts. For demonstrating the tool's application, different design criteria based on user requirements are considered.	Some observations can be made of the design solution obtained after the optimization procedure.

## 02. LITERATURE SURVEY

TOPIC	PUBLICATION YEAR	FEATURES	PROS	CONS
High Efficiency All Terrain Exploratory Rover	NCETET-2015 Conference Proceedings	i. Gain information about the environment [5]. ii. Work for an extended period without human intervention [2]. iii. Move either all or part of itself throughout its operating environment without human assistance [3]. iv. Avoid situations that are harmful to people, property, or itself unless those are part of its design specifications.	The communication between the rover and the base station occur wirelessly	Chances of lost connectivity
Surveillance Rover for Scientific Applications	Proceedings of International Conference "ICSEM'13"2013	Astable multivibrator, Pick-up coil, Distant monitoring facility, Poor accessible areas	Advancement in technology has provided different sensors for constantly monitoring the said parameters. This rover is self powered with a rechargeable battery and it moves on wheels. It can work continuously for hours with this in-built battery	Chances of lost connectivity

## 02. LITERATURE SURVEY

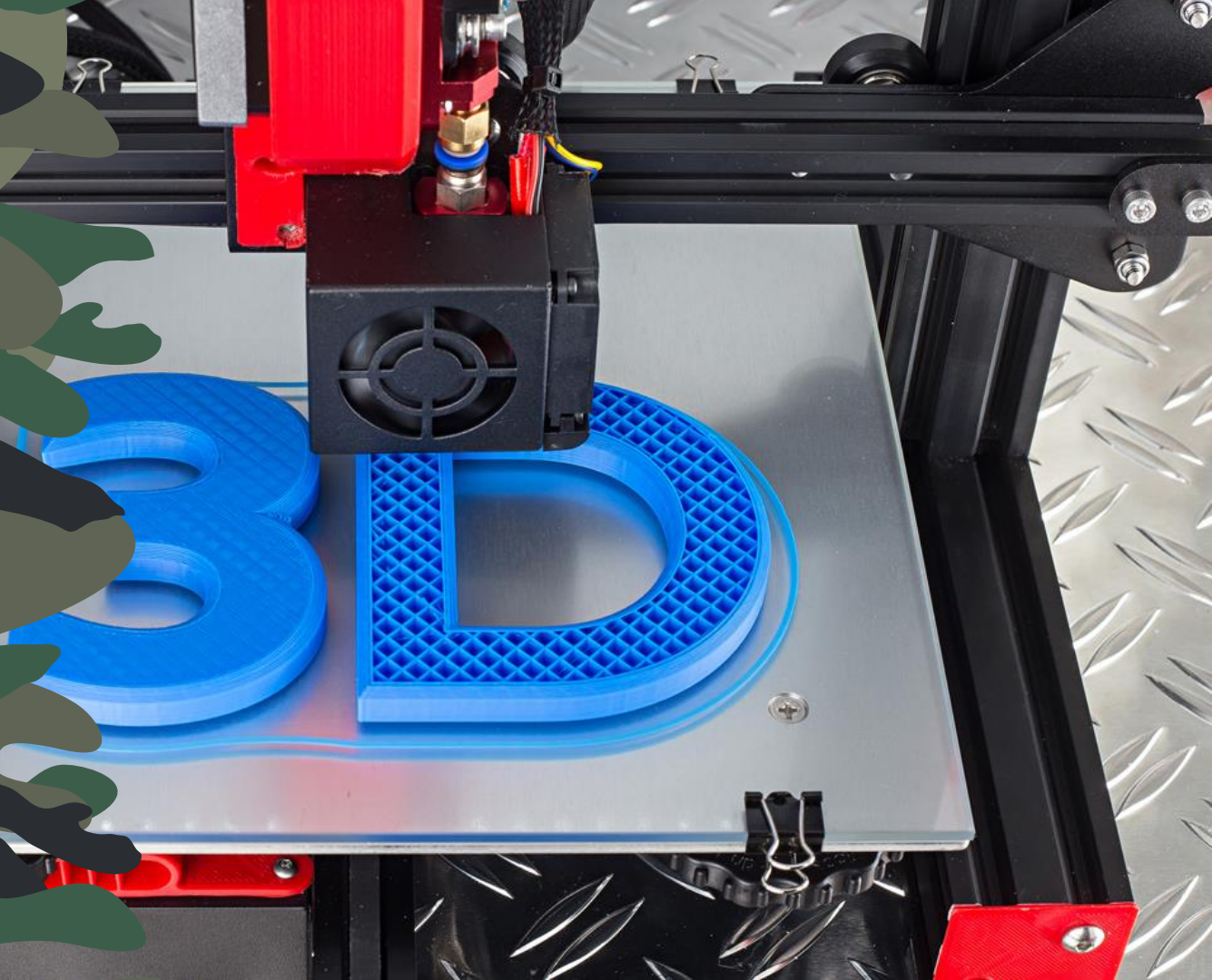
TOPIC	PUBLICATION YEAR	FEATURES	PROS	CONS
Visual Object Detection and Tracking using YOLO and SORT	Vol. 8 Issue 11, November-2019	Tracking-by-detection, You Only Look Once (YOLO), Simple Online and Realtime Tracking (SORT), visual tracking.	An algorithm analyses sequential video frames and outputs target motion between frames to execute video tracking. Various algorithms exist, each with strengths and weaknesses.	variations in illumination, changes in scale, rapid and abrupt movement, partial occlusions, movement blur, deformation of objects and background clutters.
Object Detection and Classification using YOLOv3	NCREIS - 2020	YOLO, Convolutional Neural Network, Bounding Box, Anchor Box, Fast Region Based Convolutional Neural Network, Intersection over Union, Non-Max Suppression, COCO Dataset	Fast Region Based Convolutional Neural Network, Intersection over Union, Non-Max Suppression,	The rules are easy to create and can be instantly comprehensively photographed
Multiple Object Tracking using Deep Learning with YOLO V5	NCREIS - 2021 Conference Proceedings Conference Proceedings	Multiple Object Tracking (MOT); YoloV5; Deep Learning; Dataset/Model	Tracking can broadly be divided into multiple Object Tracking (MOT) and single object tracking. Multiple Object Tracking (MOT) p	While the custom model was used the object detection and tracking had an accuracy prediction in range of 20-90% according to the clarity of image and appearance of object in image.

## 03. PROPOSED SYSTEM

- Contain a moving terrestrial drone
- The drone contains
  1. Power unit
  2. Motor & wheels.
  3. Motor controlling unit
  4. Receiver and transmitter
  5. Cameras & sensors
  6. CPU system
  7. Tracking device
- The drone is controlled wirelessly and automatic modes
- Can be used in places where human works in a risky environment
- Economical than human
- Also used as weapon.

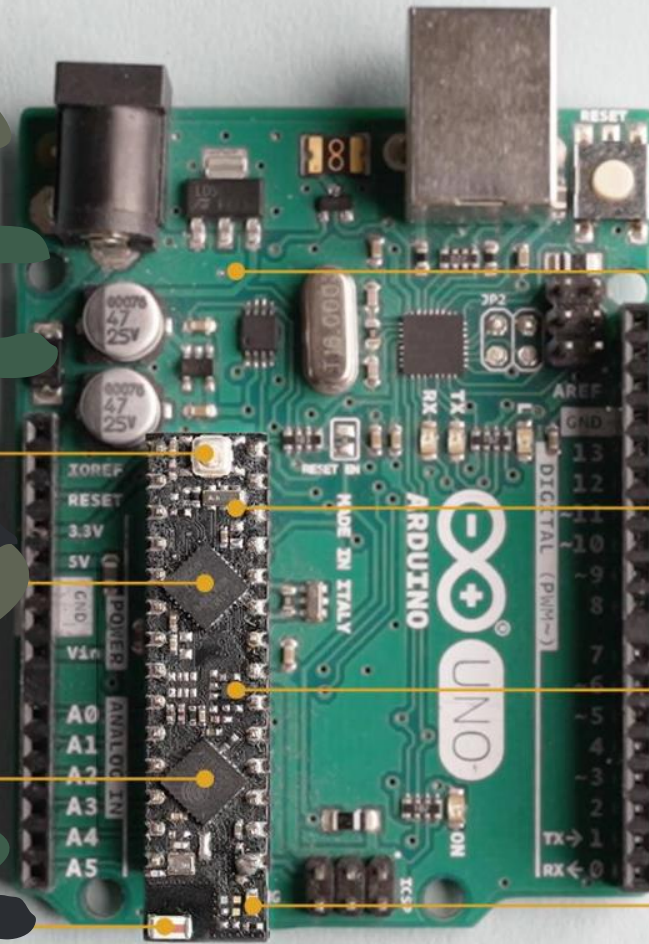


**3D printing**, or additive manufacturing, is the construction of a three-dimensional object from a CAD model or a digital 3D model.



Arduino microcontroller  
Featured snippet from the  
web

Arduino consists of both a  
**physical programmable  
circuit board** (often referred  
to as a microcontroller) and a  
piece of software, or IDE  
(Integrated Development  
Environment) that runs on  
your computer, used to write  
and upload computer code to  
the physical board.



Arduino UNO  
or compatible

Jolly Module

3.3V Ldo regulator

Wi-Fi Led

## RF Transmitter Receiver Module

By combining the two objects i.e. wireless communication with Arduino, we can create a wide range of applications like remote controlled cars, wirelessly operated robots, home automation, simple data transfer etc.

In this project, we are going to design a system in which two Arduino boards will communicate with each other using RF Module.





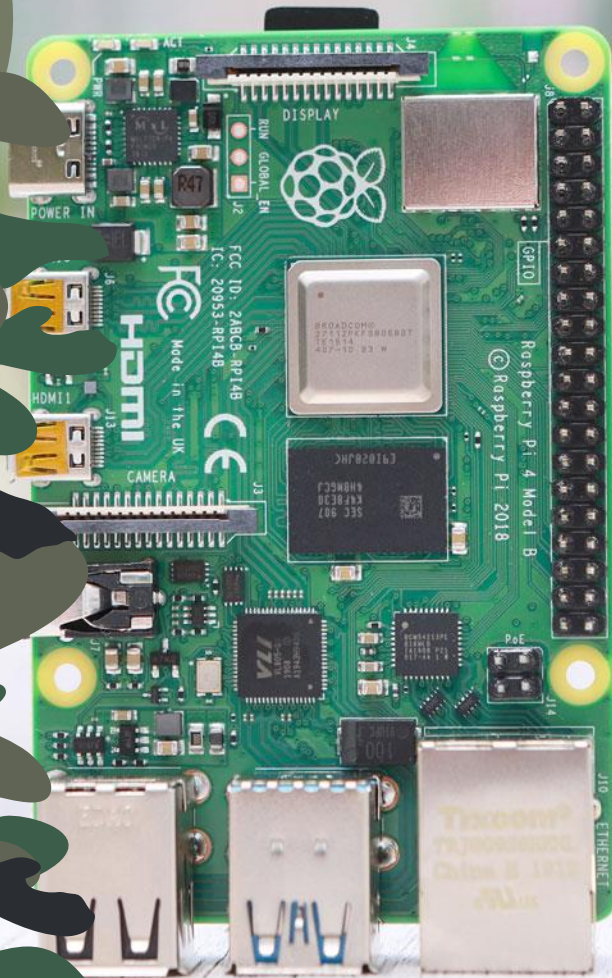
Motor drivers  
we can control the speed  
of the DC motor by simply  
controlling the input  
voltage to the motor and  
the most common method  
of doing that is by using  
PWM signal.



Motor and wheels.

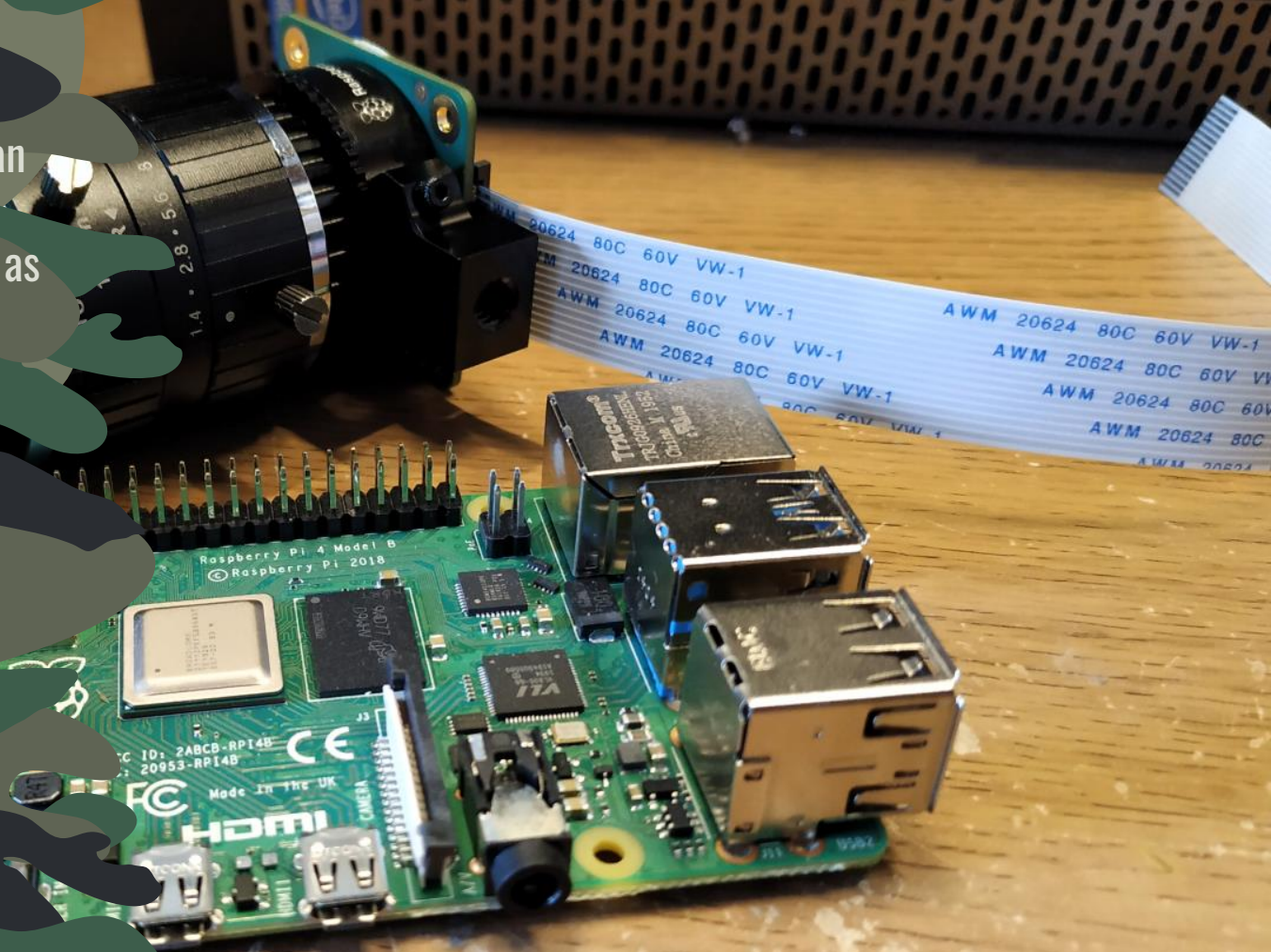


people use the Raspberry Pi to learn programming skills, build hardware projects, do home automation, implement Kubernetes clusters and Edge computing, and even use them in industrial applications.

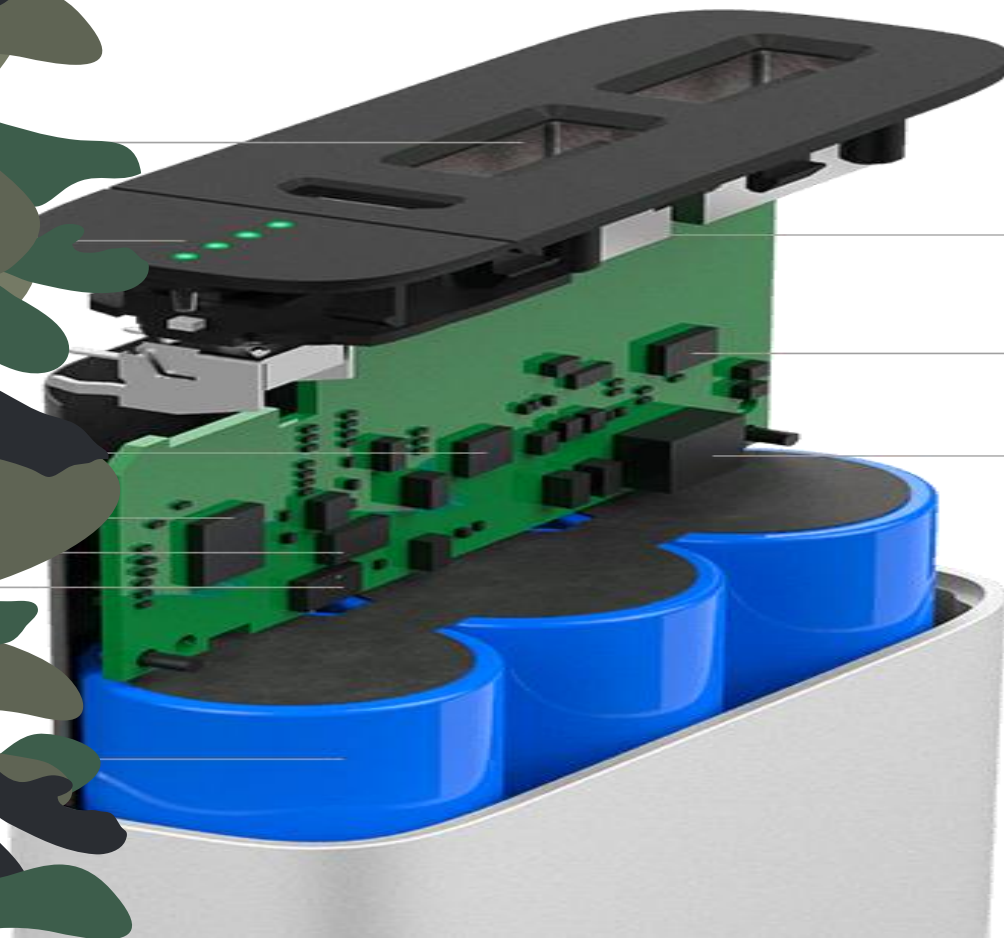




The Camera Module can  
be used to take high-  
definition video, as well as  
stills photographs.



battery power unit



8

9

10



YOLO algorithm employs **convolutional neural networks (CNN)** to **detect objects in real-time**. As the name suggests, the algorithm requires only a single forward propagation through a neural network to detect objects. This means that prediction in the entire image is done in a single algorithm run

Video stream

### YOLO algorithm



Single image extraction



Scale image to 416x416



Convolutional neural network



Outputs filtration  
(non max suppression)

#### Processing results



Draw detections



Track objects

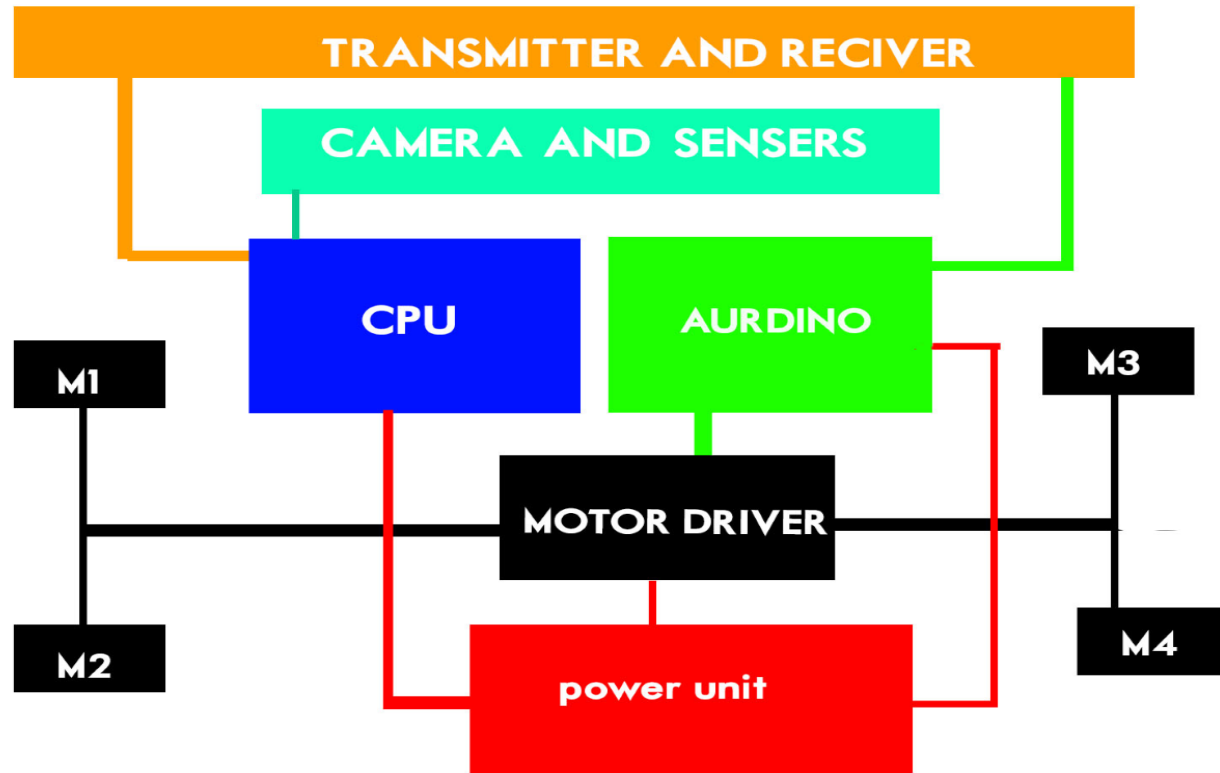
#### Output files



Processed video file



Log files



**SCHEMATIC**



# 04.SYSTEM CONFIGURATION



- WINDOWS 7+ / UBANDU OPERATING SYSTEM
- AURDINO UNO OR +
- LM32 MOTOR DRIVER
- BRUSH MOTORS
- BLUETHOOH OR WIFI RADIO TRANSMITTERS
- RASBERRY PI 4B
- CAMERA MODULE AND SENSERS
- LANGUAGE C,PHYTHON
- EXTERNAL MODULE\_YOLO ALGORITHM
- 3D PRINTED PARTS
- SMARTPHONE FOR TRANSMITER
- POWER UNIT 5V- 9V



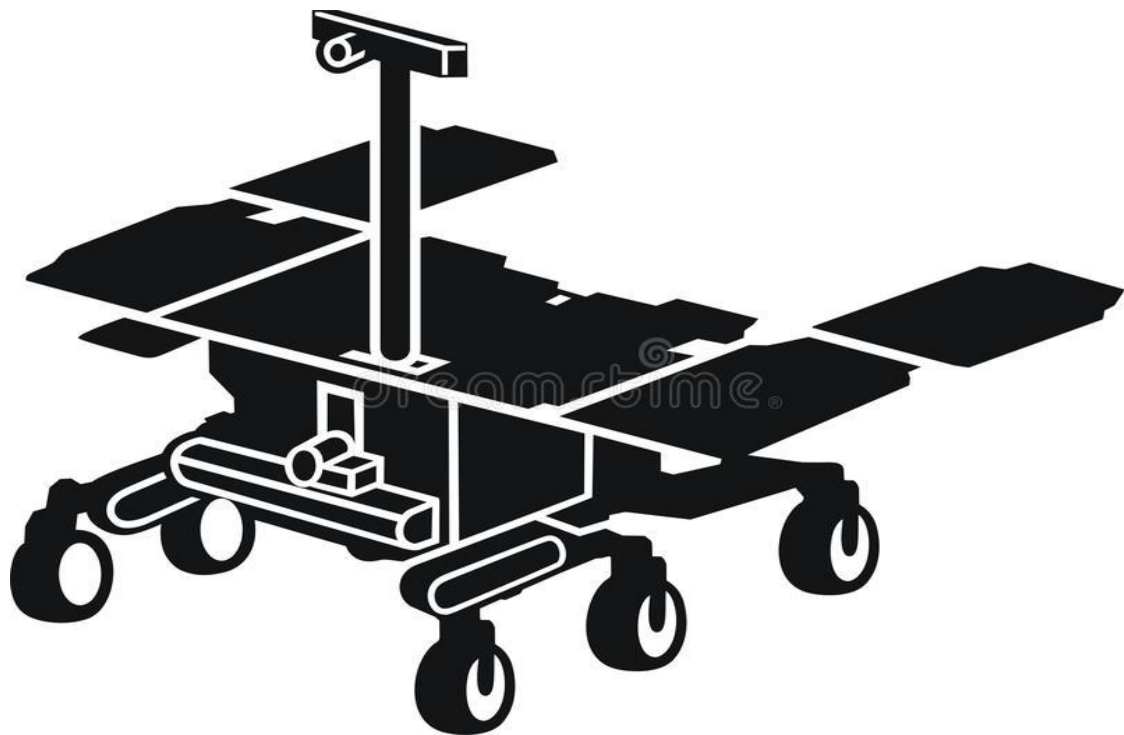


## 05.EXPECTED OUTCOME



- A MINI ALL TERESTRIAL ROVER DRONE
- THE DRONE CAN BE CONTROLLED MANUALY OR AUTOMATIC MODES
- THE DRONE CAN DEDUCT OBJECT SUCH AS WEPONS AND OTHER OBJECTS.
- WE CAN OBSERVE ANY THING AND MAKE PROGRESSIONS WITHOUT HUMAN HANDS .





EXPECTED OUTCOME

# 06.REFERENCES

- **Authors :** Akshaykumar Pillai, Akash Dhayalkar, Meghan Yesji, Trupti Shah
- **Paper ID :** IJERTCONV9IS03047
- **Volume & Issue :** NTASU – 2020 (Volume 09 – Issue 03)
- Wikipedia
- GitHub:
- Stack Overflow
- [1] Li Tan, Xu Dong, Yuxi Ma, Chongchong Yu ,“ A Multiple Object Tracking Algorithm Based on YOLO Detection” ,IEEE, 2018 [2] ShiJie Sun, Naveed Akhtar, HuanSheng Song, Ajmal Mian, Mubarak Shah ,” Deep Affinity Network for Multiple Object Tracking ”, JOURNAL OF LATEX CLASS FILES, VOL. 13, NO. 9, SEPTEMBER 2017. [3] HASITH KARUNASEKERA , HAN WANG , (Senior Member, IEEE), AND HANDUO ZHANG “ Multiple Object Tracking With Attention to Appearance, Structure, Motion and Size”,IEEE, 104423-104432 ,VOLUME 7, 2019 [4] Shriharsha S. Veni,Ananda S. Hiremath,Mahalakshmi Patil, Mayuri Shinde, Aishwarya Teli “ Video-Based Detection, Counting and Classification of Vehicles using OpenCV ” ICICNIS 2020. [5] Samira Karimi Mansoub,Rahem Abri,Anil Hakan Yarıcı,” Concurrent Real-Time Object Detection on Multiple Live Streams Using Optimization CPU and GPU Resources in YOLOv3 ” , IARIA, 2019, ISBN: 978-1-61208-716-0.



# THANK YOU



Do you have any questions?

