Agriculture farm guarding robot

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GROUP NO-7

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Introduction

- **The farmers are often concerned about the crop and its protection against Pest.**
- **What is a pest ?**

• A pest is any living organism which competes with human, domestic animals or desirable plants for food or water.

• At the same time they spread diseases to mankind and harms the environment.

- **What is Pest control?**

• Pest control refers to the regulation or management of a species defined as a pest, usually because it is perceived to be detrimental to a person's health, the ecology or the economy.

- **Types of pests** • Locust • Cockroach, termites, beetles • Wild Animals • Birds

• Any plant growing where they are unwanted

OBJECTIVE

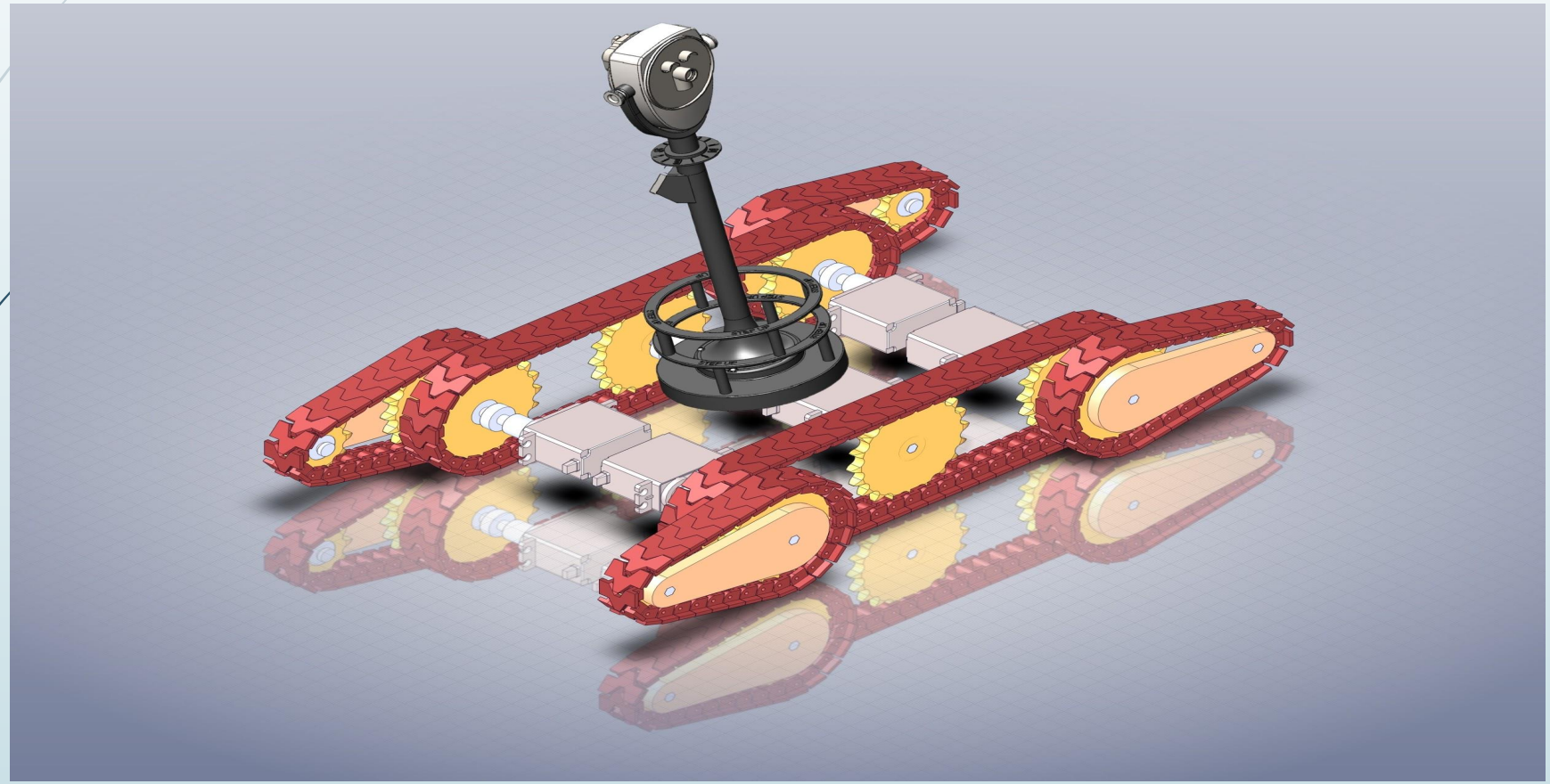
- **Farm guarding by Robotics**
- **Why Farm guarding by Robotics?**

- We can expect the robots to perform agricultural operations autonomously such as spraying and mechanical weed control, watching the farms day & night for an effective protection against locust and insect, allowing farmers to reduce the environmental impact, increase precision and efficiency, and manage individual plants in novel ways.

Problem Management

- By building a robot that give effective solution against locust ,wild animals and birds.
- ✔ We are planning to prevent the pest by detection , path planning and countermeasure against locust, wild animals, birds with different techniques.

CAD Model



Concept

- **Locust**
  - **Detection :**

    Locust emit certain range of frequency which will be detected by *Ultrasonic sensor*.

  - **Counter Measure :**

    Bot will radiate frequency from *Ultrasonic Power Cannon (M161) Kemo part L010* speaker *and LM380 Ultrasonic Transducer* amplifier which act as a repellent against locust.

Concept

- **Wild Animals:**
  - **Detection :**

    Bot will use *PIR sensor* to detect any motion in the farm field and then it will confirm the presence of wild animals by image processing and deep learning with help of attached cameras.

  - **Counter Measure:**

    The speaker will produce such noise which make them go away.

Concept

- **Birds**
  - **Detection :**

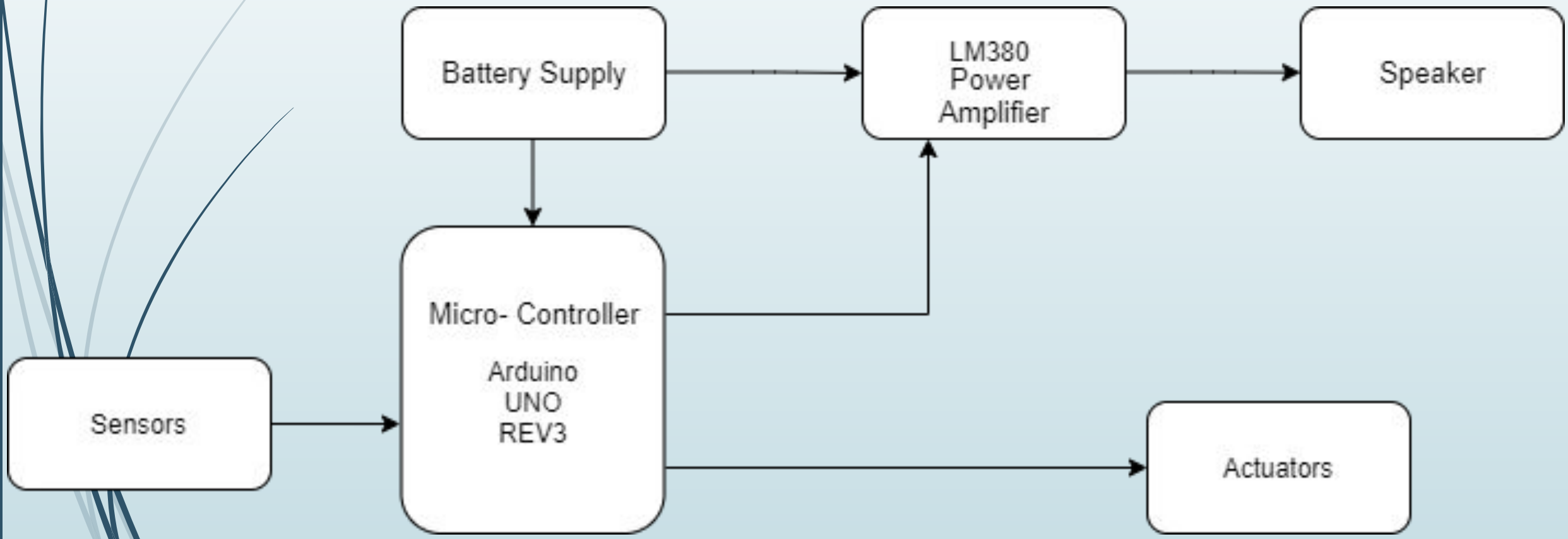
    We will be using a deep learning algorithm to detect the sound of the birds. A rich dataset that includes clear representations of the possible variations in vocalisations of each bird will be fed in the system.
  - **Counter Measure:**

    The detector after recognizing the sound will automatically emit the frequency ranging from 15 kHz to 25 kHz which in turn will scare off the birds.

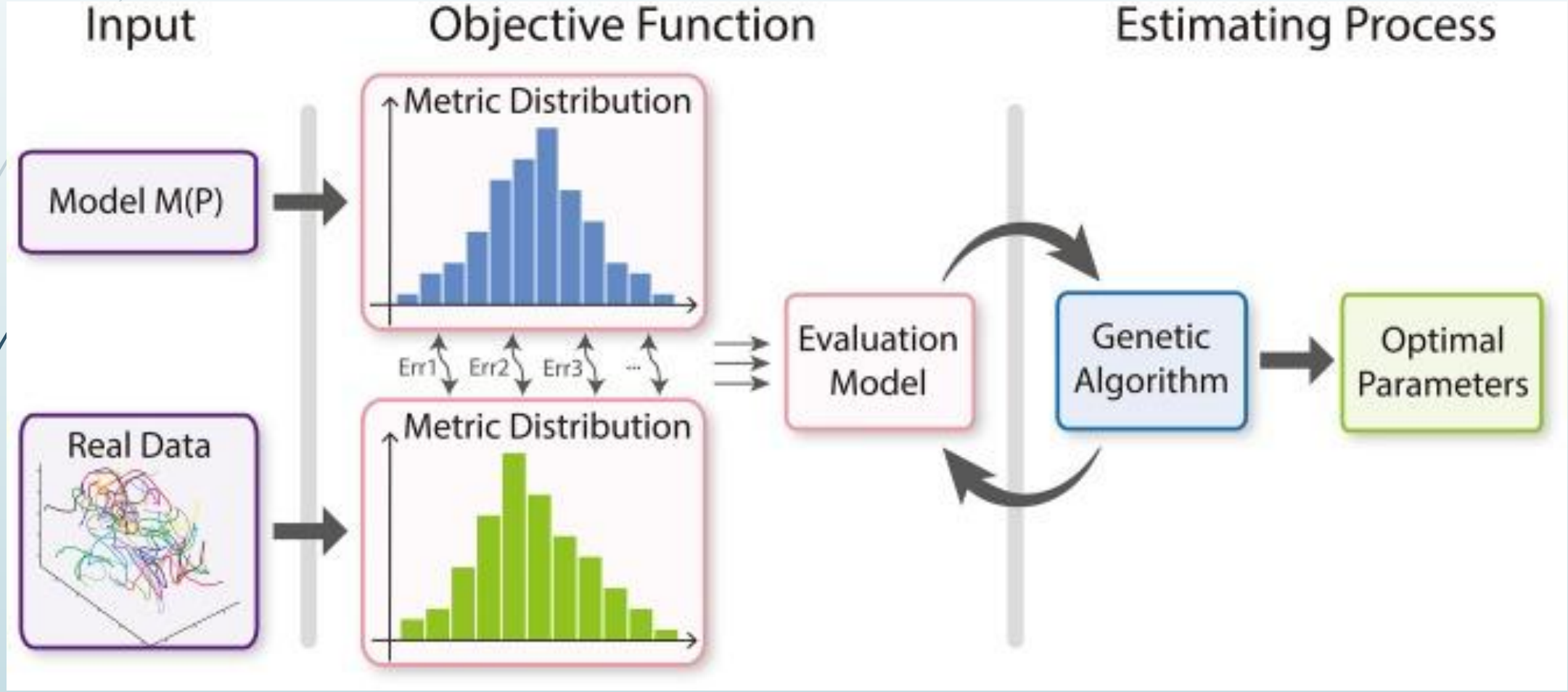
Material Required

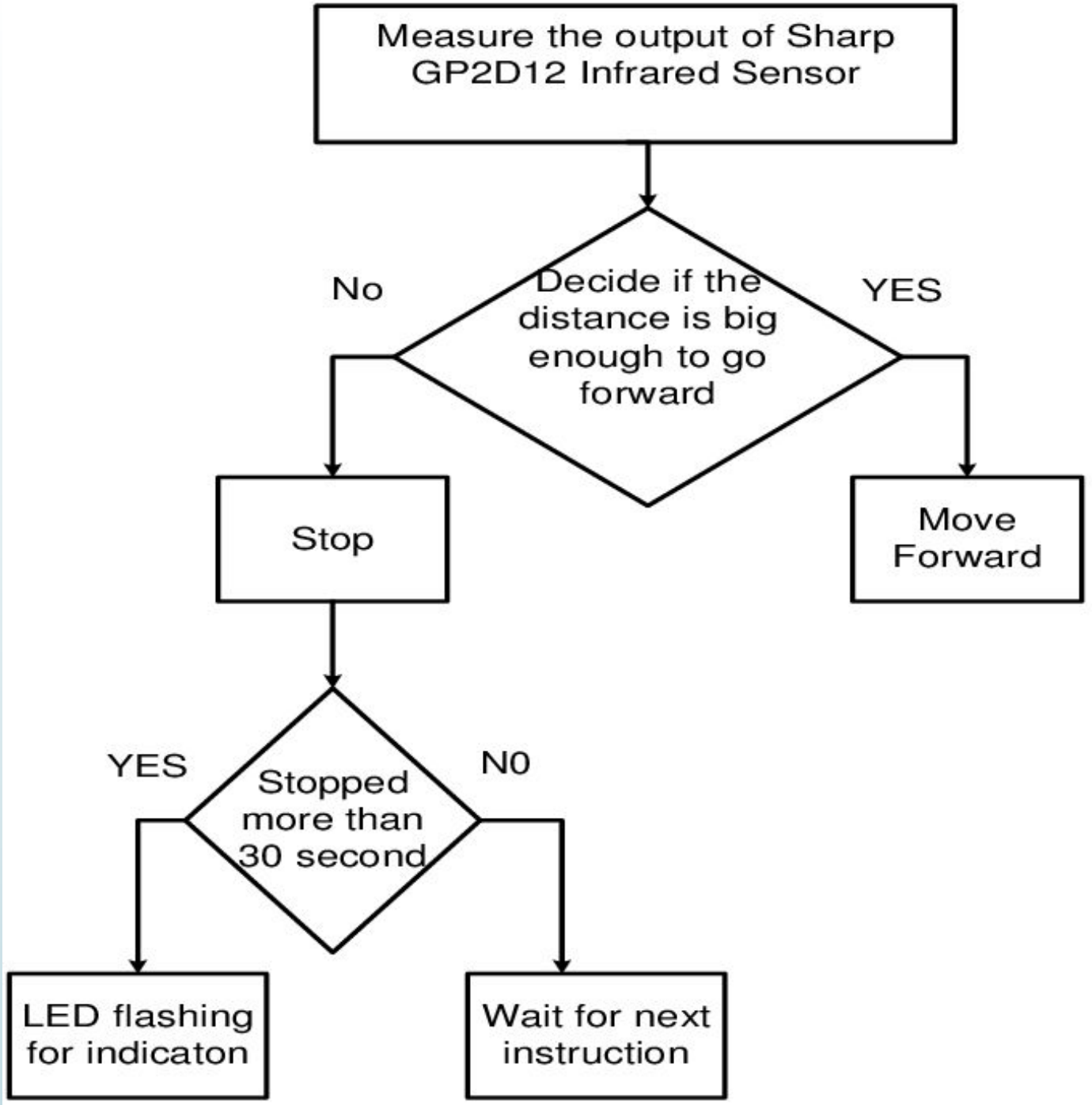
1. *LM 380 Ultrasonic Transducer*
2. *Speakers*
3. *Microcontroller Arduino UNO REV3*
4. *Ultrasonic Sensor*
5. *Battery supply*
6. *PIR Sensor*
7. *Camera 5MP*
8. *Servo Motor*
9. *Johnson Motor*

Circuit Block Diagram

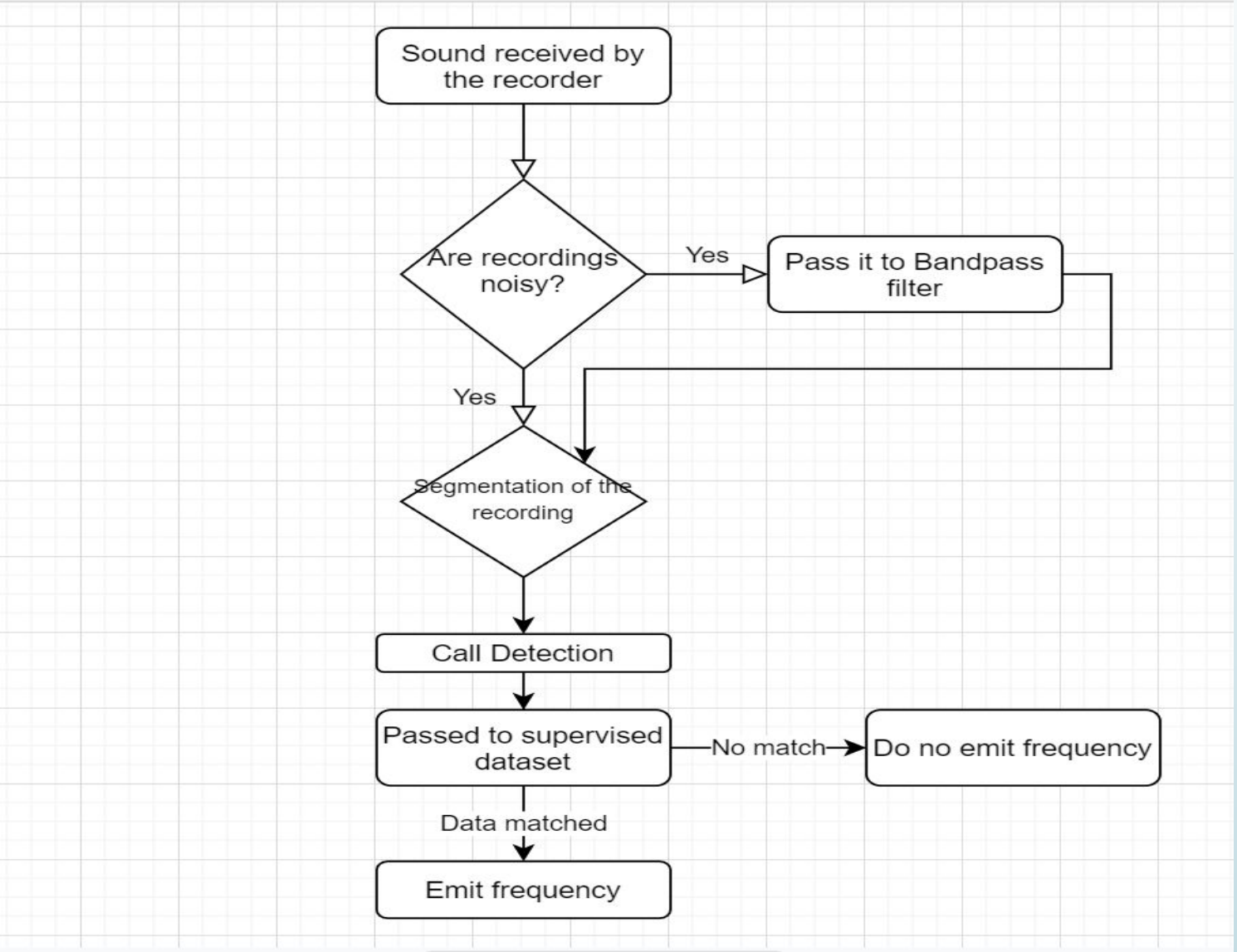


MACHINE LEARNING MODEL FLOW CHART



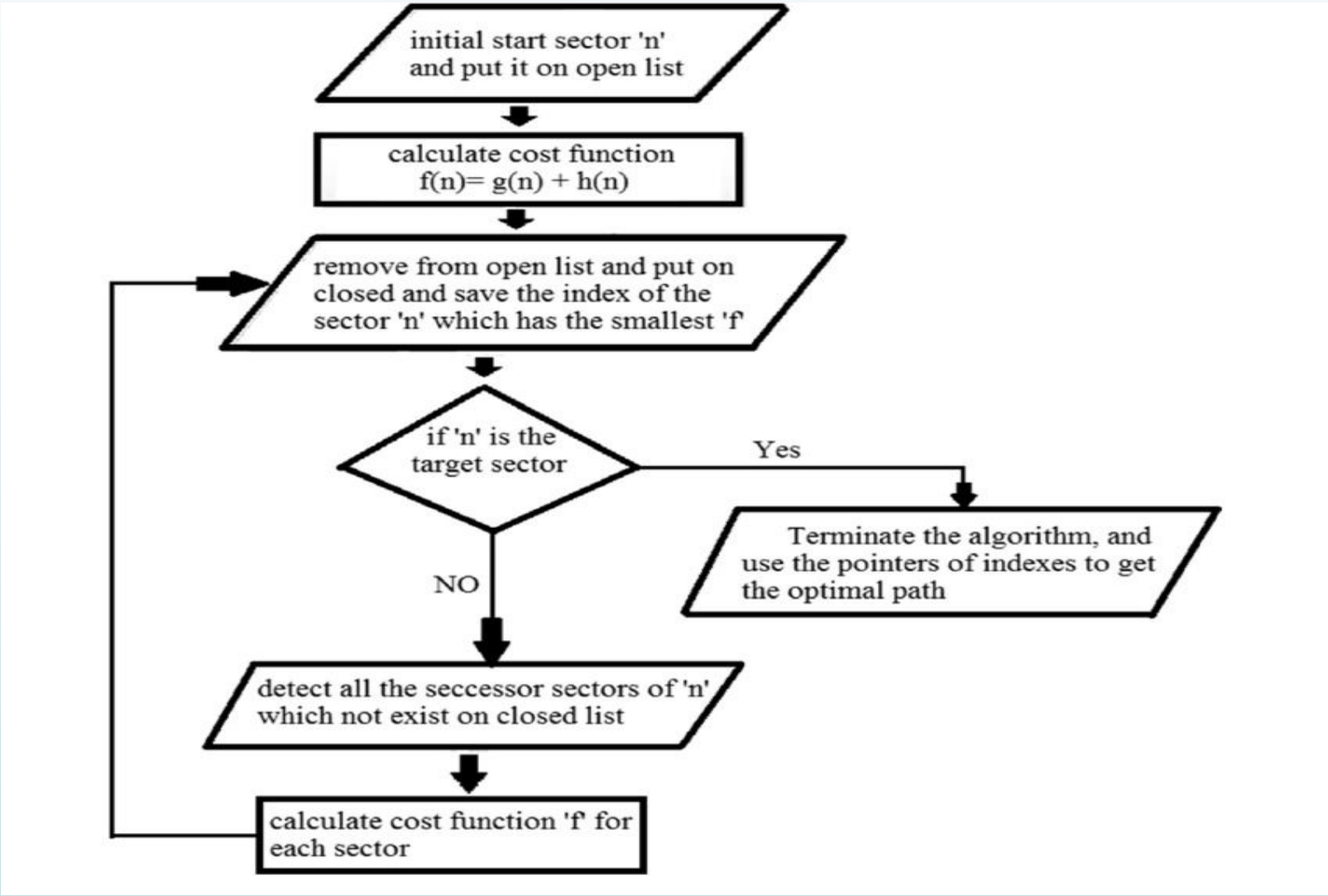

Measure the output of Sharp GP2D12 Infrared Sensor
Decide if the distance is big enough to go forward
No
YES
Stop
Move Forward
Stopped more than 30 second
YES
N0
LED flashing for indicaton
Wait for next instruction

Birds Sound Detection Flowchart

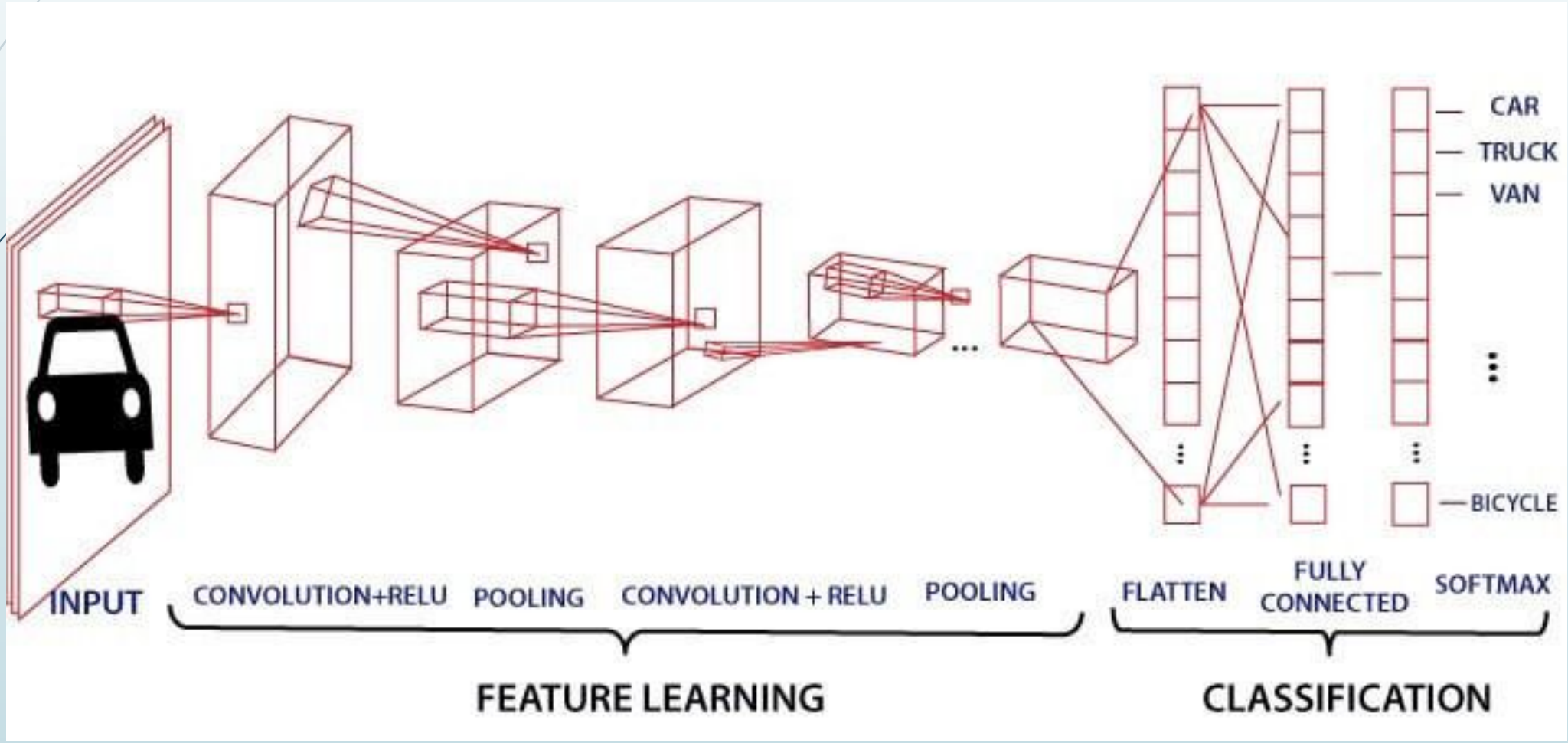


A* Algorithm Working For Path Planning

A* Search algorithms, unlike other traversal techniques, it has “brains”. What it means is that it is really a smart algorithm which separates it from the other conventional algorithms.



Deep Learning Model Designing For Image Classification



THANK YOU