THE TECHNOCRACY
STUDENTS' TECHNICAL COMMITTEE, NIT RAIPUR

AAVARTAN'22-23

VIGYAAN

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

PROBLEM STATEMENTS

ECE01. <u>Movement detector</u>

Human traffic scanner for security reasons (motion sensor) for number of students and differentiate between incoming and outgoing students.
• find how many people are there in store at a particular moment
• If two people are going together then how would this model detect in that situation?
• +1 -1 would be done by the application.

ECE02. <u>Automatic plant irrigation system using waste water for farms.</u>

There is a huge amount of waste water generated in village areas from a wide variety of activities. This waste water can be utilized for crop irrigation purposes. The project involves creation of a system that is automatically able to filter the waste water, making it suitable for irrigating a wide variety of different crops. If required the water can be imbued with certain minerals which would improve the growth of the crops. And then using the filtered water for automatic plant irrigation.

ECE03. <u>Smart food packet scanner and diet intake recommender.</u>

Design a system which can be used for persons following a strict diet. Scanning the food packets the system is able to measure the amount of nutrients within each packet. Based on these calculations, the system is able to recommend the food products a user needs to eat at

that particular day in order to follow their diet. Create a system that can be integrated within smart fridges. The system is also capable of warning/taking automatic action if the food item has expired.

ECE04. A smart medicine and drug maintenance system in pharmacy shops.

Pharmacy owners often face the difficulty of not being able to maintain the drugs and medicines which they keep in their stores. Design a system which is capable of placing regular orders and checking the expiry dates of medicines, give appropriate notifications to the shop owner and discard the medicines if the date has passed.

ECE05. Air quality detector and filter for use inside vehicle cabins.

Utility vehicles and trucks used near construction sites or mining sites have poor quality of air inside the driver's cabin. This can lead to driver fatigue and can be hazardous to their health. This could also lead to drowsiness which is a factor for risk at such sites. Thus, create a system which is able to track the air quality inside the vehicle cabins and automatically filter it. If filtration by regular methods is not possible, it should automatically alert the driver at frequent intervals.

ECE06. An AI based interactive robot to support and care for the elderly.

An AI based interactive robot to care for the elderly, tend to their problems and needs and ensure their physical and mental well-being.

ECE07. Robots to patrol the border areas which are inaccessible to humans during certain weather conditions.

In order to defend positions at the borders where there cannot be guards stationed 24/7, design a system of hidden equipment to monitor these positions at all times and generate alarms as and when required. The equipment should in theory be able to withstand extreme weather conditions.

ECE08. Drones and robots to aid the search and rescue operations during earthquake.

Every year, many lives are lost around the world due to earthquakes and ground related natural calamities. In such events, the organizations such as the Red Cross Society, try to help the survivors. In order to aid such heroes, develop drones or robots which are capable of aiding in such search and rescue operations. They may also be capable of aiding the refugees.

ECE09. Design an AI based system that can identify some medicinal plants.(Based on leaves, stem etc.

Medicinal plants have always been studied and considered due to their high importance for preserving human health. However, identifying medicinal plants is very time-consuming, tedious

and requires an experienced specialist.Thus design a vision based AI system to identify some medicinal plants (minimum 5).

ECE10. Design a low cost charcoal based cooling system.

In Warm regions of the world, especially the rural areas where households are not connected to electricity,charcoal coolers are used for storage purposes.
The charcoal cooler is a storage chamber that is used to keep perishable commodities without the need of electricity. The chamber works on the principle of evaporative cooling.
Your task is to make the same.

ECE11. Design a drone system to tackle labour problems in agricultural field.

Design a drone based sprinkler system(which can sprinkle both water and pesticides) so that the farmer can irrigate and take care of his farm without having to go into the field and also does not need to depend on labour.it should have a camera system attached.