



**THE TECHNOCRACY**  
STUDENTS' TECHNICAL COMMITTEE, NIT RAIPUR

## AAVARTAN'22-23



### VIGYAAN DEPARTMENT OF INFORMATION TECHNOLOGY

#### PROBLEM STATEMENTS

##### **IT01. Ground water data analysis and visualization tool**

The Central Ground Water Board (CGWB) (<http://cgwb.gov.in>) publishes the data regarding the ground water levels for different states in the form of ground water year books. However, performing an aggregate analysis on the year-wise data just from these books is a complex and hectic task. In order to aid in better understanding and analysis, design a platform which is capable of providing better data analysis and visualization of this data from these year books. The system should also be capable of updating its information every year by automated web scraping.

In order to create a user-friendly dashboard and analysis platform with good visualization, tools such as Tableau and PowerBI may be used.

Ground water year book - analysis - dashboard - tableau - powerbi

##### **IT02. A robot helper for carrying luggage at bus and railway stations**

Luggage carriage at bus and railway stations can be automated with the help of robots. These robots become activated as soon as payment is made to them and then follow the owner of the luggage using the camera attached to them. Thus, they would help the owner carry the luggage on and off the public transports. This application would also be particularly useful to the differently-abled passengers.

##### **IT03. A chat bot to address various hostel issues and provide support**

Hostel inmates are well aware of the various problems one might face in hostels, which include electricity issues, broken furniture, water issues, etc. In order to address these issues, design an AI-enabled chatbot which is capable of providing assistance and support to the hostel inmates. Such a chatbot would help to improve and ease the complaint registration

process and provide quick access to all the related and relevant information.

#### **IT04. Quick count of trees using flying drones**

Tree census is done every year to get an estimate of different species and their count. However, the human method is very tedious and expensive. Rather, a solution could be that a drone attached with a camera which is used to accurately determine the count of different species of trees would be really helpful. Along with this, a brief overall health determination of trees can be done using images that would be granted bonus points.

The participants can procure their own datasets for this purpose, however the details of the dataset must be included.

#### **IT05. Iris movement detection for paralyzed patients**

In order to help patients suffering from severe physical impairment or paralysis, an adaptive eye-gaze tracking system can be built that detects the iris movements and gaze of the patients in order to operate a computer system. One possible example is the use of this eye-gaze tracking to control a virtual keyboard and one of the possible methods of implementation could be with the use of fuzzy logic techniques.

#### **IT06. An AI-enabled grass-cutter system**

In large areas such as sport grounds or campus grounds, there is often a huge overgrowth of grass once the area is left alone for a while. Its maintenance is a costly affair. Thus, an AI-enabled grass-cutter system can be used, which automatically determines the location of regions with overgrowth and cuts the extra growth. This would reduce the cost to hire workers and would speed up the process as when left alone, the machines would automatically perform the required work.

#### **IT07. An IoT based elderly-care system**

Design an IoT enabled system which is able to take care of the elderly and cater to their regular needs. The system should be capable of tracking the vitals of the elderly and raise the alarms in case of any emergency situation. The system can also be connected to other smart systems of the house to change the ambience as per their need.

#### **IT08. Blockchain based land-registry system to reduce frauds and delays**

Due to the involvement of a large number of middle-men and brokers, there has been an increasing number of fraud cases and huge time-delays are created. There is also the possibility of introducing human errors. Introduction of the blockchain technology in this field would lead to an acceleration of the entire process while mitigating a large number of possible frauds and errors. There would also be an increased transparency by introduction of smart contracts.