

Machine Learning Group 1

1. Title: Sign language recognition system

- a. **Objective:** To build a system that allows easy communication with mutes
- b. **Description:** A system that takes hand gestures as input and in return will provide the words as output thus providing effective communication with mutes
- c. **Platform:** Android and Machine Learning
- d. **Software requirements:** Python
- e. **Hardware requirements:** Camera/ Android Device
- f. **Data requirements:** Images of different sign language symbols to train the model

2. Title: Smart and Dynamic Traffic Light Control System

- a. **Objective:** To develop a system which control traffic lights dynamically, which results in minimum traffic.
- b. **Description:** A system that takes various parameters such as number of cars on-road and the status of nearby traffic light signals to control the flow of traffic to minimize traffic and accidents. Decisions for emergency conditions are also to be considered like prioritizing ambulances or fire trucks.
- c. **Platform:** Machine Learning, IoT
- d. **Software requirements:** Python
- e. **Hardware requirements:** Cameras IR Sensor
- f. **Data requirements:** Traffic Data

Machine Learning Group 2

1. **Title: Identification of diseases among crops in farms to improve agricultural produce**
 - a. **Objective:** To train a model to identify diseases in crops by analysing leaves' images so that proper and timed treatment could be provided to the plants.
 - b. **Description:** The delay and inaccuracy of identification plant diseases is causing significant reduction in both quality and quantity of agricultural products. Automatic detection of plant and related diseases based on a leaf image would be very helpful for the farming world and it will speed up deployment of remedy quickly to reduce or eliminate damage from the disease.
 - c. **Platform:** Machine Learning, Computer Vision and IoT
 - d. **Software Requirements:** Python and C
 - e. **Hardware Requirements:** Dedicated Systems and cameras for farms, Microcontrollers (Arduino or Raspberry Pi), A centralized server
 - f. **Data Requirements:** Labelled Images of healthy as well as unhealthy leaves are required to train the classifier, Data of diseases and their cures
2. **Title: Data Analysis to detect suicidal/criminal tendencies**
 - a. **Objective:** To create a system which can analyse the data from National Crime Record Bureau to detect prone areas.
 - b. **Description:** The system is to be designed to prevent loss of our nation and save innocent lives by detecting prone areas and suggesting preventive measures. The system should be able to analyse the crime data of NCR and detect suicidal or criminal tendencies to help authorities intervene before it is too late.
 - c. **Platform:** Data science and analysis
 - d. **Software Requirements:** Python, R or MATLAB/OCTAVE
 - e. **Hardware Requirements:** None
 - f. **Data Requirements:** Data from the NCR

Internet of Things Group

1. **Title: IoT based Automated Lighting and Electrical Control System for NIT Raipur**
 - a. **Objective:** To implement a control system for all the electrical devices including lights/ACs to increase power saving and efficiency of these devices.
 - b. **Description:** An institute of a stature such as NIT Raipur requires a control system which maximises the efficiency of the electricity used and also reduces the power wastage. Through an automated system, we can achieve huge power savings and intelligent use of all electrical appliances.
 - c. **Platform:** IoT
 - d. **Software Requirements:** C or Python
 - e. **Hardware requirements:** A centralised server, Different sensors, Arduino/Raspberry Pi (or some other microcontrollers)
 - f. **Data Requirements:** Data stream from sensors

2. **Title: System for maintaining and controlling optimal environment in Greenhouses**
 - a. **Objective:** To develop a greenhouse monitor and control system which will help the farmers to automate the task of maintaining optimal levels of growth for plants
 - b. **Description:** Our system will constantly sense the temperature, lights, requirement of gases, soil fertility and other requirement like fertilizers and irrigation. It will use Radio signals to provide information about the greenhouse and also provide an interface for controlling the greenhouse such as setting the amount of light, irrigating the plants, spreading fertilizers etc.
 - c. **Platform:** IOT
 - d. **Software requirements:** Micro Controller OS, C
 - e. **Hardware requirements:** Different sensors for temperature, light, soil fertility, ZigBee module, Microcontroller unit such as STM32
 - f. **Data requirements:** Basic data about what should be optimal temperature, light intensity, greenhouse gas requirement and fertilizers