HACK-CSE-LERATE (SIT RESEARCH GATE)

Team Name: HackHers

Team Members details:

Role	Name	USN (College Reg no.)	College Name	Email id	Phone no.
Team Leader	POORVI PRAHALAD PUROHIT	1SI23AD037	SIT	1si23ad037@sit.ac.in	7019352759
Team Member 1	MANYA M	1SI23AD029	SIT	1si23ad029@sit.ac.in	9148187554
Team Member 2	MEGHANA T B	1SI23CS111	SIT	1si23cs111@sit.ac.in	7624862648
Team Member 3	JAYADIXITHA S P	1SI23ET019	SIT	1si23et019@sit.ac.in	9611274542

Abstract 01

Smart Crop Health Monitoring and Automated Irrigation System

Agricultural productivity is highly dependent on early detection of crop health issues. Traditional methods of monitoring plant health are time-consuming and inefficient, leading to delayed interventions and reduced yields. This project proposes a smart**, AI-driven crop health monitoring system integrated with automated irrigation** to assist farmers in **real-time**.

Our system uses an **IR sensor** to measure the **light absorption and reflection properties of crops**, helping detect early signs of stress or disease. The collected data is processed using **machine learning models such as Logistic Regression and Random Forest** to classify plant health into categories like healthy, stressed, or diseased. The results are **transmitted via a Bluetooth module to a mobile application or dashboard**, enabling farmers to take timely action.

Additionally, the system integrates a **DC motor-based water spray mechanism** that activates automatically when crop stress is detected, ensuring optimal hydration levels. This **low-cost, scalable solution** can be easily implemented in small and large farms, reducing manual labour and preventing yield losses due to undetected crop health deterioration.

By integrating **AI and IoT**, our project aims to provide an efficient, real-time crop monitoring system that helps farmers with data-driven insights and automated solutions, **ensuring better agricultural sustainability and productivity.**

Abstract 02

AI-Driven Clustering of Mental Health Posts for Early Intervention

Mental health issues are a growing concern worldwide, with many individuals turning to social media platforms and online forums to express their thoughts, emotions, and struggles. However, due to the overwhelming volume of posts, identifying at-risk individuals and providing timely support remains a significant challenge. Traditional mental health monitoring methods are manual and reactive, leading to delayed interventions and missed opportunities for early assistance.

This project proposes an AI-driven clustering system that automatically analyses and categorizes mental health-related **social media posts** to detect patterns, emotions, and potential crisis situations. Using **Natural Language Processing** (NLP) and **Unsupervised Learning** (such as K-Means or DBSCAN clustering algorithms), the system processes large-scale textual data to **group posts based on sentiment, emotional tone, and psychological distress levels.**

The clustered data is then used to generate insights for mental health professionals, crisis helplines, and researchers, enabling them to **identify emerging mental health trends and prioritize support for high-risk individuals.** The system can also integrate **real-time alerts** to flag posts with alarming content, such as signs of severe distress, self-harm ideation, or suicidal thoughts, for appropriate intervention.

By integrating AI and data analytics, this project aims to create a scalable and automated mental health monitoring system, facilitating **early detection of distress signals, improving mental health awareness, and enhancing crisis intervention efforts.**

Abstract 03

Smart Environmental Pollution Monitoring and Alert System

Environmental pollution is a growing concern, with air and water contamination leading to serious health and ecological issues. Traditional pollution monitoring methods rely on large-scale infrastructure and delayed reporting, making it difficult to track pollution sources in real time. This project proposes a smart, AI-driven environmental pollution monitoring system that utilizes **real-time data collection and clustering techniques** to identify pollution hotspots effectively.

Our system integrates real-time weather data and WRIS soil moisture data to analyse potential pollution trends. The collected data is processed using **clustering algorithms like K-Means or DBSCAN** to identify pollution hotspots and patterns over time. The results are **transmitted via a Bluetooth module to a dashboard or mobile application** (if time permits), enabling local authorities and environmental agencies to take timely action.

Additionally, the system includes a real-time alert mechanism that notifies users when pollution levels exceed safe thresholds. This **low-cost, scalable solution** can be deployed in urban and rural areas, allowing for **early detection of pollution sources** and better decision-making to mitigate environmental hazards.

By integrating **AI and IoT**, this project aims to provide an efficient, **real-time pollution monitoring system** that empowers communities with data-driven insights and automated alerts, ensuring a cleaner and healthier environment.