

Problem Statements - CODEUTSAVA 7.0

Problem Statement 1:

Background:

The National Institutional Ranking Framework (NIRF) ranks colleges across India based on a multitude of factors, including infrastructure, faculty quality, student performance, and more. These rankings serve as a valuable reference for students, educators, policymakers, and institutions themselves, guiding decisions and improvements in the higher education sector.

Problem:

Currently, the process of tracking and understanding ranking changes is manual and time-consuming. Additionally, analyzing trends in various factors of multiple colleges over the years poses a significant challenge. Without efficient tools, valuable insights into the factors influencing ranking changes and areas of improvement remain out of reach. The participants must develop an automated platform that not only monitors ranking changes but also compares trends in critical factors over time would have a profound impact and offers actionable recommendations for improvement based on comparative analysis.

Tech Tags: @Artificial Intelligence , @Machine Learning , @Data Visualization

Impact:

It would revolutionize the way we view and utilize NIRF rankings by reducing the time and effort required for data analysis, providing valuable insights into performance trends, empowering educational institutions to make informed decisions about enhancement, and ultimately, contributing to the overall improvement of the higher education landscape in India by fostering data-driven decision-making.

Such a platform would have a far-reaching impact on colleges, students, and the educational ecosystem, helping institutions thrive and provide a high-quality learning experience.

Problem Statement 2:

Background:

Increasing threat of climate change means an increase in demand for innovative solutions to combat carbon emissions. Conventional methods often lack transparency, accountability, and efficient incentives for organizations to reduce their carbon footprint.

Problem Statement:

This project aims to develop a platform leveraging IoT technology. This platform will enable efficient carbon emission data management by collecting real-time data from various sources via specialized sensors. To ensure the utmost security and trust in the data, this system will be powered by blockchain technology, which guarantees the integrity of the information. Furthermore, it will provide a user-friendly interface for authorized stakeholders, striving to create a transparent and accessible solution to combat carbon emissions, promoting sustainability and accountability

Tech Tags: @Blockchain, @IoT Sensors, @Carbon Emissions, @Sustainable Technology.

Impact:

This platform will enable efficient carbon emission data management by collecting real-time data from various sources via specialized sensors. By ensuring data security, integrity, and providing a user-friendly interface for authorized stakeholders, this initiative strives to create a transparent and accessible solution to combat carbon emissions, promoting sustainability and accountability. Additionally, the development of this platform lays the foundation for carbon trading and carbon credit tokenization, allowing organizations to engage in meaningful carbon offset initiatives and contributing to a greener future.

Problem Statement 3:

Background:

Maintaining road infrastructure is a constant challenge for urban areas. Potholes, in particular, pose safety risks and increase maintenance costs. Traditional manual inspection methods are time-consuming and often imprecise.

Problem Statement:

To address this issue, we invite participants to develop a robust IoT drone framework for detecting potholes in a target area, collecting data, and seamlessly visualizing the recorded data in the cloud.

The IoT drones could be equipped with advanced data collection mechanisms, including high-resolution cameras, LiDAR sensors, and GPS modules, to ensure the comprehensive gathering of data. Participants are tasked with developing a streamlined data collection process, where drones can autonomously fly over roadways, capture data, and transmit it to a centralized system in real-time.

The aim is to create an IoT drone framework that can precisely detect potholes and their characteristics. The framework should employ various sensors to identify potholes based on multiple features, such as depth, size, shape, and surface condition. For example, accelerometers and gyroscopes can be used to determine depth irregularities, while cameras can capture the shape and size of potholes.

Tech Tags: @Internet of Things (IoT), @Machine Learning, @Artificial Intelligence, @Real-time Monitoring

Impact:

The development of an IoT drone framework for pothole detection and cloud-based data collection promises safer roads, cost savings through timely maintenance, efficient resource allocation, improved accountability in road management, and minimized traffic disruptions. This technology has the potential to transform the way urban road infrastructure is maintained, benefiting both local governments and the public.

Problem Statement 4:

Background :

The challenge here is that when you look for houses online, the pictures and information might not show what the houses are really like. This can make people miss out on good houses just because of the online listings. To fix this, we need a creative solution that uses Augmented Reality (AR) and Virtual Reality (VR) to make the online house-hunting experience better, helping real estate agents sell more houses.

Problem Statement:

This challenge asks participants to think about how we show houses online. The goal is to create a simple AR/VR platform for real estate agents that connects the online world with the real world. With this platform, people looking for houses can explore them virtually and get a feel for the layout and atmosphere. Augmented Reality can highlight important parts of the house, giving detailed information to help them decide. By taking people on a virtual tour, this technology can change the way we see houses online, making it more interesting and informative. It can also use AI and ML to provide insights and suggestions while people explore houses.

Tech tag: @Artificial Intelligence, @Machine Learning, @Augmented Reality, @Virtual Reality, @Real Estate

Impact:

With this AR/VR platform, real estate agents can show houses in a more realistic and immersive way, making customers happier and increasing sales. Buyers can explore houses from anywhere, anytime, without having to travel or make appointments. They can also customize their viewing experience by changing the lighting, furniture, and decor, or by adding notes and feedback. This makes finding and selling houses more convenient and enjoyable for everyone.

Problem Statement 5:

Background:

The agri-food supply chain is crucial for efficient food delivery, but it's complex due to many stakeholders. Transportation and distribution of agro-products is challenging, with a need to reduce costs and optimize performance. Recent tech advancements introduced Advanced Transportation Management Systems (ATMS) for better planning, execution, and monitoring. Tailored ATMS solutions are essential for dynamic and demanding scenarios in the transportation industry.

Problem Statement:

The agri-food supply chain faces substantial challenges in transportation and distribution. These challenges include complex operations involving multiple stakeholders, varying transportation modes, changing environmental conditions, and the need to optimize routes while minimizing costs. The absence of a specialized transportation management system tailored to this domain exacerbates these difficulties. Consequently, there is a critical need to design and develop an Advanced Transportation Management System (ATMS) specifically for the agri-food supply chain to address these unique challenges effectively.

Impact:

The development of a specialized Advanced Transportation Management System (ATMS) prototype tailored to the agri-food supply chain holds transformative potential. It promises enhanced safety and regulatory compliance through asset tracking and maintenance, reducing the risk of accidents and ensuring consistent adherence to legal standards. Real-time monitoring and analytics empower stakeholders with valuable insights for informed decision-making, enhancing adaptability and responsiveness. Furthermore, the ATMS optimizes routes, reduces fuel consumption, and cuts operational costs, contributing to sustainability by lowering carbon emissions. Its scalability ensures transportation providers of all sizes can access innovative solutions, promoting widespread adoption and ultimately benefiting transportation, businesses, and society by streamlining the movement of agro-products to consumers.

Tech tag: @Artificial Intelligence, @Machine Learning, @Supply Chain