Department of Computer Science and Engineering
KPR Institute of Engineering and Technology

KPRIET
Learn Beyond

24 Hours Hackathon

Ethical HackHive 2K4

GUIDELINES AND PROBLEM STATEMENT

Registration

• Please register your team ASAP using this " https://tinyurl.com/KPRCSEEthicalHackHive" link

Code Repository Guidelines

• Participants must use github for managing their codebase.

• Participants should make sure that the repository that they are sharing with us is public after 24hrs.

• Participants should not make only a single commit/push to repository with the final codebase, they should start with an empty repository and then keep on committing and pushing their code at some checkpoints of their choice.

Hosting/Deployment

• Participants can choose wherever they want to host and deploy their application.

• Some of free to use service providers are etlif, etlify, firebase, aws etc.

Submissions

• Label as per your team name. Number will be provided by the organizer

• The working prototype must be hosted and link published on the Github repository

• The cleaned and well labelled code must be present in the same Github repository

• Figma/ Adobe XD links, Documented/ automated test cases etc. to be uploaded on the Github repository

• A short video summing up your presentation in no more than 5 minutes uploaded on the Github repository itself

• Please submit the link to your Github repository "https://github.com/KPRCSEHackHive" complete in all respects to be mailed at no later than 20.03.2024 10.00 PM.

Rules and Regulations

The solution with an interface must include an Information Architecture and actual Figma/ Adobe XD or another designing tool

You can use any language to build your solution.

You can use any open-source tools.

You need to bring the IoT related components.

Your code must be modular and reusable across components.

Selection Criteria

1. **Technical Solution Presentation Requirement:**
    a. All participants are required to present their technical solutions to the audience.
    b. To what extent was the hack technically impressive?
    c. Did the team address a challenging technical problem?
    d. Did the team employ any exceptionally clever techniques in their solution?

2. **Design pattern requirement:**
    a. Did the team consider the user experience, and how well-designed is the interface they developed?

3. **Quality Check:**
    a. Did the team adhere to all quality parameters and conduct performance testing?

4. **Completion:**
    a. Does the hack function as intended? Did the team accomplish all their objectives?

5. **Learning:**
    a. Did the team challenge themselves and attempt to learn new concepts or technologies? What types of projects have they previously undertaken?

PROBLEM STATEMENT

AI/ML RELATED TO HEALTH CARE

AIPS01: Develop a machine learning model or algorithm to analyse electrocardiogram (ECG) signals and detect stress levels in individuals. The solution should accurately classify stress levels based on features extracted from the ECG signals, considering factors such as heart rate variability, amplitude changes, and waveform morphology. Participants are tasked with preprocessing the data, extracting relevant features, building a predictive model, and ensuring the model's interpretability and ethical considerations. The goal is to create an effective tool for stress assessment using ECG signals, with potential applications in healthcare and wellness monitoring.

Download the Dataset from Arachnophobia or DriveDB

AIPS02: Dr. Primya, a healthcare practitioner in India focusing on telemedicine outreach to remote areas, faces challenges in achieving accurate and timely diagnoses. She seeks a cost-effective technological solution capable of efficiently processing substantial amounts of unstructured data to extract insights and enhance clinical diagnostics. Primya aims to leverage technology to improve healthcare delivery and accessibility, particularly in underserved regions of India.

Develop a solution based on Gen AI that can personalize diagnosis and treatment to support Primya by predicting disease progression, creating patient-specific treatment plans and enhancing telemedicine experiences.

AIPS03: Imagine you are part of a team tasked with developing a groundbreaking healthcare data visualization tool. Consider the following scenario: In a bustling urban hospital, Mr. prem, the head of cardiology, is overwhelmed with patient data. He finds it challenging to efficiently analyze and interpret the vast amount of information generated daily, ranging from ECG readings to lab results and medication histories. As a result, there are delays in diagnosis and treatment decisions, impacting patient care.

Your task is to develop a data visualization tool that addresses Mr. Prem needs. The tool should allow him to seamlessly navigate through complex patient datasets, identify trends, and gain actionable insights at a glance. By providing intuitive visualization features, your solution should empower Dr. Prem to make informed decisions quickly, ultimately improving patient outcomes and streamlining healthcare delivery in the hospital.

You can take any dataset from Kaggle/Google search to demonstrate the results.

AIPS04: You are part of a team tasked with developing an innovative elder patient tracking system utilizing monocular cameras to monitor and detect instances of falls due to illness. Consider the following scenario: In a retirement community, caregivers face the challenge of ensuring the safety and well-being of elderly residents, particularly those with chronic illnesses or mobility issues. Despite their best efforts, detecting falls promptly remains a significant concern, as delays in assistance can lead to serious consequences for the residents.

Your task is to design a reliable tracking system that utilizes monocular cameras strategically placed throughout the facility to monitor the movements of elderly patients. The system should be capable of identifying and accurately detecting falls in real-time, distinguishing between intentional movements and accidental falls due to illness or loss of balance. By providing timely alerts to caregivers, your solution aims to enhance the quality of care provided to elderly residents, reduce response times in emergency situations, and ultimately improve their overall safety and well-being.

CYBER SECURITY RELATED

CSPS01: As organizations increasingly rely on digital infrastructure, ensuring the security of their systems is paramount. Traditional penetration testing methods can be time-consuming and costly. To address this challenge, we need a tool that automates penetration testing by simulating various attack scenarios to comprehensively assess system vulnerabilities.

Develop an automated penetration testing tool, named KPRAutoScan, that can simulate diverse attack scenarios to identify and evaluate vulnerabilities in systems. The tool should be capable of conducting comprehensive assessments without the need for extensive manual intervention. It should provide detailed reports outlining discovered vulnerabilities and recommended mitigation measures.

CSPS02: A large financial institution wants to enhance its security posture by proactively detecting and preventing insider threats. They seek an innovative solution that can analyze user behavior, network activity, and data access patterns to identify suspicious activities and prevent potential security breaches caused by insiders.

Design an effective solution, named KPRCyberGuard, that leverages advanced techniques such as user behavior analytics, anomaly detection, and data loss prevention to mitigate the risks posed by insider threats. The solution should provide real-time monitoring, alerts, and policy enforcement capabilities to ensure proactive threat detection and prevention within the organization's network.

CSPS03: A government agency investigating a cyber attack on a critical infrastructure network requires a reliable tool to reconstruct digital evidence and identify the perpetrators. They need a solution that can analyze various types of data, including network traffic logs, system files, and memory dumps, to uncover the tactics, techniques, and procedures (TTPs) used by the attackers.

Design KPRForensicPro, an advanced forensic analysis tool that can process diverse digital evidence sources and provide comprehensive insights into cyber attacks. The tool should assist investigators in piecing together the timeline of events, identifying the attack vectors, and attributing the attack to specific threat actors, ultimately aiding in the prosecution of cyber criminals.

CSPS04: A multinational corporation needs a secure platform for confidential communication among its employees, particularly for discussing sensitive business strategies and sharing proprietary data. They seek a solution that ensures privacy and prevents unauthorized access to their communications, protecting valuable information from eavesdropping by adversaries or competitors.

Create KPRSecureComm, a robust communication platform that employs end-to-end encryption to secure messages, calls, and file transfers between users. The platform should prioritize user privacy and data protection, offering seamless and intuitive communication while mitigating the risks associated with eavesdropping and interception of sensitive information.

FULLSTACK RELATED

FSPS01: A leading e-commerce company is preparing to launch a new mobile app for their platform. They want to ensure that the app is secure and free from vulnerabilities that could compromise user data or expose their systems to attacks. They need a reliable tool that can thoroughly assess the security of their Android and iOS applications before deployment.

Create Mobile application KPR-S-Scan, an efficient and user-friendly tool that can analyze Android and iOS applications for vulnerabilities. The tool should provide detailed reports outlining identified vulnerabilities and recommended mitigation measures to ensure the security of mobile applications in various environments.

FSPS02: A large corporation relies on wireless networks for its day-to-day operations. However, they have concerns about the security of their network due to the potential for man-in-the-middle attacks. They need a solution to detect and prevent such attacks to safeguard their sensitive data and maintain the integrity of their communications.

Create KPRWiGuard, a robust system capable of identifying and mitigating man-in-the-middle attacks on wireless networks. The system should provide real-time monitoring of network traffic, detect suspicious activity indicative of such attacks, and implement countermeasures to prevent data interception and unauthorized access.

FSPS03: A small business wants to create an online platform to streamline its operations, from managing inventory and sales to engaging with customers. They need a fullstack application that integrates front-end, back-end, and database functionalities to provide a seamless user experience and optimize business processes.

Design and develop KPRFullStack360, a fullstack application that meets the requirements of the small business. The application should include intuitive user interfaces, robust backend functionality, secure data storage, and efficient communication between the front-end and back-end components. Additionally, the solution should be scalable and adaptable to accommodate future growth and evolving business need.

FSPS04: A real estate agency aims to establish a strong online presence to showcase properties and attract potential buyers. They require a website with dynamic features that enable easy updating of property listings, descriptions, and images without relying on technical expertise. The agency envisions a user-friendly interface where staff members can seamlessly manage website content to keep it up-to-date and engaging for visitors.

Create a dynamic website for real estate that prioritizes user-friendliness and simplicity in data management. The solution should feature an intuitive user console where staff members can easily add, edit, or remove property listings and associated details such as descriptions, images, and prices. The website should provide a visually appealing and engaging experience for visitors while ensuring effortless content management for non-technical users.

IOT RELATED

IOPS01: A smart home company is concerned about the security of its IoT devices, which include smart thermostats, cameras, and door locks. They want a solution to monitor device activity, detect suspicious behavior, and protect against potential cyber-attacks that could compromise the security and privacy of their customers' homes.

Create IoT KPRSecureGuard, an effective tool for monitoring and securing IoT devices. The tool should provide real-time monitoring of device activity, identify anomalies indicative of cyber threats, and implement security measures to prevent unauthorized access and exploitation of IoT devices.

IOPS02: A financial institution is exploring biometric authentication methods to enhance security and streamline user access to sensitive financial data. However, they are concerned about potential privacy risks and unauthorized access to biometric data. They need a solution that ensures robust security while prioritizing user privacy and preventing unauthorized use of biometric information.

Develop KPRBiometricShield, a cutting-edge solution for biometric authentication that guarantees security and privacy protection. The solution should implement advanced encryption techniques to secure biometric data, adhere to privacy regulations, and incorporate mechanisms to prevent unauthorized access or misuse of biometric information.

IOPS03: A bustling city faces increasing traffic congestion, leading to longer commute times, pollution, and safety hazards. The city administration seeks a solution to alleviate these issues by implementing a smart traffic management system. They envision a system that leverages IoT devices to gather traffic data, analyze patterns, and dynamically adjust traffic signals and routes to improve overall traffic flow and safety.

Create KPRIntelliTraffic, an innovative traffic management system that harnesses IoT technology to revolutionize urban mobility. The solution should integrate seamlessly with existing infrastructure, collecting real-time data from IoT sensors installed at key locations such as intersections, highways, and public transportation hubs. By analyzing this data, IntelliTraffic should be capable of making intelligent decisions, such as optimizing signal timings, suggesting alternative routes to drivers, and coordinating traffic flow to minimize congestion and enhance safety on the roads.

IOPS04: A family seeks to modernize their home with smart technologies to enhance comfort, convenience, and security. They desire a solution that automates various aspects of their home environment, such as adjusting lighting levels, regulating room temperatures, and monitoring security cameras. Additionally, they prefer intuitive controls that enable them to interact with the system effortlessly using voice commands or gestures.

Create a KPRSmartHome Automation system that fulfills the family's requirements by integrating IoT devices and smart sensors into their home environment. The system should enable automation of home appliances and systems, allowing for seamless control and management. Moreover, it should incorporate voice recognition or gesture-based interfaces to provide intuitive and user-friendly controls for enhanced convenience and accessibility.