



# PANIMALAR ENGINEERING COLLEGE

An Autonomous Institution

## [JAISAKTHI EDUCATIONAL TRUST]

Approved by AICTE | Affiliated to Anna University | Recognized by UGC

All Eligible UG Programs are Accredited by NBA

Bangalore Trunk Road, Varadharajapuram, Poonamallee, Chennai- 600 123

### INDIA'S WOMEN CENTRIC NATIONAL LEVEL 24 – HOUR HACKATHON **TECHDIVATHON – 2.0**

**She blooms. She leads. She conquers**



**Domain: TECHNOLOGY**

**Problem Statements:**

S.No	Title	Problem Statement	Description
1	AI-Driven Public Transportation Optimizer	Public transit schedules are inefficient and static.	Develop an AI-enabled system that analyzes live urban traffic, rider patterns, and resource distribution to dynamically optimize bus/train frequencies for sustainability and efficiency.
2	Blockchain-Based Intellectual Property Vault	Creators struggle to securely store and prove ownership of digital content.	Implement a blockchain vault to timestamp, verify, and protect the provenance of digital creations and inventions for individuals and businesses.
3	Smart Elderly Fall Detection Socks	Elderly patients often go undetected after in-home falls.	Design sensor-embedded socks with wireless communication that alert caregivers in case of abnormal motion or falls, aiding rapid response.
4	Ultra-Low Power IoT Wildlife Tracker	Wildlife conservation relies on bulky or intrusive tracking tech.	Build a solar-powered, ultra-low energy IoT device for real-time, long-term wildlife movement tracking that supports conservation research.
5	Biometric Secure Prescription Platform	Prescription fraud is a growing healthcare concern.	Create a biometric system linking verified prescribers with recipients, auto-tracking prescriptions in a tamper-proof manner for pharmacies.
6	Ed-Tech Gamified Skill Validation App	Students lack engaging ways to validate new skills.	Develop a gamified mobile app that assesses, tracks, and awards badges for mastering topics from coding to soft skills, using interactive challenges and AI feedback.
7	Water Quality Sensor Mesh Network	Rural water contamination risks go undetected for weeks.	Deploy a mesh of autonomous sensors blending IoT and AI for real-time detection/reporting of water toxins, bacteria, and pollution to authorities and communities.
8	Mixed Reality Career Guidance Platform	High school students make uninformed career choices.	Build an MR platform for immersive exploration of diverse career paths, enabling job shadowing, skill trials, and mentor interaction in virtual settings.

9	Privacy-Preserving Federated Health Data Exchange	Medical data sharing is hampered by privacy regulations.	Design a federated learning platform for hospitals to train AI models on patient data without ever sharing raw data, ensuring compliance and accelerating research.
10	AI-Powered Urban Flood Risk Prediction Platform	Cities face sudden, localized flooding without accurate, street-level risk forecasts.	Develop a platform that fuses satellite data, hyperlocal rain and drainage sensors, and historical records with AI to generate real-time, lane-level flood risk maps and early alerts for citizens and authorities.
11	Crowd-Sourced Public Grievance Heatmap	Civic complaints are siloed and under-addressed.	Build an app and dashboard for citizens to report local issues, visualizing city-wide grievances and prioritizing government attention by density/severity
12	Voice-to-Code Rapid App Generator	App development remains slow for those who can't code.	Implement a platform where users describe app features and logic via voice, with instant conversion to working code for deployment.
13	Ethical AI Governance and Bias Auditing Toolkit	Public and enterprise AI systems are often opaque, biased, and non-compliant with emerging regulations.	Create a toolkit that continuously audits AI models for bias, fairness, transparency, and regulatory compliance, generating human-readable reports and actionable mitigation strategies for developers and policymakers.
14	Peer-to-Peer Renewable Energy Marketplace	Small producers can't sell excess clean energy efficiently.	Develop a secure P2P marketplace for trading renewable energy units among local homes and businesses, using smart contracts and live energy matching.
15	On-Demand Zero-Waste Food Delivery	Food takeout produces excess packaging waste.	Engineer a system for reusable container sharing, tracking, and cleaning between consumers and restaurants, incentivized by app-based credits for zero-waste orders.
16	AI-Powered Accessibility Content Checker	Digital resources often fail accessibility standards.	Create an AI-powered tool that automatically audits websites, documents, and apps for compliance with accessibility norms, suggesting enhancements for users with disabilities.
17	Citizen Digital Identity Wallet with Selective Disclosure	Users repeatedly overshare personal data across services, increasing privacy and identity theft risks.	Design a self-sovereign digital identity wallet that lets citizens prove specific attributes (age, residency, qualification) via verifiable credentials and zero-knowledge proofs, without exposing full identity or raw documents.
18	Distributed Real-Time Microclimate Reporting	Local weather apps lack real-time microclimate variance.	Deploy a low-cost, distributed sensor team that streams hyperlocal weather and air updates, helping communities, schools, or farmers address fast-changing conditions.
19	Digital Twin for Building Safety Audit	Building fire and safety audits are periodic and manual.	Launch a platform using IoT sensors, BIM models, and AI to realize digital twins for continuous, predictive monitoring/auditing of physical building safety in real time.
20	Mobile E-Waste Sorting and Collection Robot	Urban e-waste sorting is inefficient and dangerous.	Deploy a mobile robot that autonomously detects, sorts, and collects electronic waste from streets/community bins, optimizing material recovery and safety.
21	AI-Enabled Livestock Health Monitoring Collar	Animal health issues cause productivity loss and disease outbreaks.	Develop smart collars that analyze animal biometrics to predict illness, alert farmers in real time, and log welfare trends for veterinary follow-up.

22	Sensor-Driven Crowdsourced Noise Pollution Map	Urban residents have no reliable noise pollution data.	Build a crowdsourced app with affordable sensors for users to upload local noise data, generating live citywide maps to inform regulation and health policy
23	Edge AI-Based Micro- Factory Management System	Small-scale manufacturing faces costly, complex digitization.	Create an edge-compute platform that tracks production, quality, and predictive maintenance for micro-factories, using local AI and plug-and-play IoT modules.
24	Gamified Smart Habit Builder Ring	Wearables for habit tracking lack engagement and reminders.	Invent a wearable smart ring that vibrates, lights up, and offers rewards for building sustainable wellness, sleep, or productivity habits using gamification.
25	Quantum-Safe Authentication for IoT Devices	Growing IoT networks will be vulnerable to quantum threats.	Engineer a post-quantum cryptography authentication protocol for securing billions of IoT devices against future quantum computing attacks.

## Reviewer's Digital Signature

**Reviewer's Name:**

**Position:**

**Organization:**

**Date:**

**Digital Signature:**