PANIMALAR ENGINEERING COLLEGE
An Autonomous Institution

[JAISAKTHI EDUCATIONAL TRUST]

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

TECHDIVATHON

Empower, Innovate, Elevate: Code the Future Together

Domain: ELECTRONICS IN AI & ML

Problem Statements:

S.No	Title	Problem Statement	Description
1	AI-Powered Object Detection Camera	Build a camera capable of detecting and classifying objects in real-time using edge AI.	Real-time object detection is critical for security, automation, and monitoring. This camera integrates edge AI to process data locally, reducing latency and cloud dependency.
2	Gesture-Controlled Home Automation System	Develop a home automation system controlled by hand gestures detected via sensors.	Traditional home automation systems rely on remotes or apps. This system enables intuitive control using hand gestures, making it more accessible and user-friendly.
3	Wearable Health Monitor with AI Analytics	Create a wearable device that tracks vital signs and uses AI to analyze trends.	Continuous health monitoring often generates raw data without actionable insights. This wearable combines sensors and AI analytics to provide personalized health advice.
4	Voice-Activated Appliance Control Board	Design a control board for home appliances that processes voice commands locally.	Voice-controlled systems often require cloud connectivity, posing security risks and delays. This board ensures quick, secure, and offline processing of voice commands.
5	Real-Time Environmental Data Logger	Build a device to monitor and log air quality and temperature data in real time.	Environmental changes often require real-time monitoring for timely interventions. This logger records air quality and temperature metrics and sends alerts for thresholds.
6	Edge AI Module for Image Recognition	Develop a low-cost hardware module capable of performing local image recognition tasks.	Image recognition usually depends on expensive systems. This module provides affordable, efficient processing, making AI accessible for smaller-scale applications.
7	Low-Power AI Processor for IoT Devices	Create a processor to handle AI tasks efficiently while conserving power for IoT applications.	IoT devices require lightweight AI processors to perform tasks like recognition or prediction while maintaining low energy consumption for extended device usability.

8	Smart Traffic Signal Controller	Develop a traffic signal controller that adjusts lights dynamically based on vehicle detection.	Conventional traffic systems often lead to congestion. This AI-driven system optimizes flow using sensors to dynamically adjust traffic lights.
9	Voice-Controlled Educational Aid Device	Create a voice-activated tool to assist students in interactive learning.	Students benefit from personalized and engaging educational aids. This device uses speech recognition to provide real-time feedback and adapt to individual learning styles.
10	AI-Integrated Personal Safety Wearable	Design a wearable device that uses AI to detect emergencies and alert contacts.	Safety wearables often lack proactive detection. This device combines sensors and AI to analyze unusual patterns and notify emergency contacts instantly.
11	AI-Based Predictive Maintenance System	Develop software that analyzes sensor data to predict equipment faults.	Equipment failures often result in downtime and costs. This system uses AI to analyze sensor data to forecast faults and schedule maintenance proactively.
12	Smart Energy Management App	Create an app that optimizes energy usage using AI-based insights.	Energy wastage is common in homes and industries. This app tracks usage patterns and suggests optimizations like scheduling appliance operations during off-peak hours.
13	AI-Powered Emotion Recognition Tool	Design software that detects emotions in real time through facial expressions.	Understanding human emotions is valuable in areas like mental health and customer service. This tool uses AI to analyze facial cues and provide real-time emotional insights.
14	Personalized Learning App Using AI	Develop an app that adapts educational content based on user progress.	Learners progress at different rates. This app uses AI to analyze user performance and tailor lessons, ensuring a personalized and effective learning experience.
15	AI-Driven Health Risk Assessment Platform	Build a platform to predict health risks using user input and medical history.	Early health risk detection can save lives. This platform combines user-reported data and medical records to predict risks and provide preventive suggestions.
16	Traffic Pattern Analysis and Prediction Tool	Create software that uses real-time data to optimize traffic flow.	Traffic congestion wastes time and resources. This tool analyzes real-time data and historical trends to predict patterns, aiding better route planning and signal management.
17	Home Automation Dashboard with AI	Develop a dashboard to centralize and automate appliance control through AI learning.	Managing multiple smart appliances can be cumbersome. This dashboard uses AI to learn user habits, automating appliance operations for convenience and energy efficiency.
18	Voice-to-Action Conversion Tool	Build software that translates voice commands into actionable tasks.	Voice-controlled systems often require integration into specific platforms. This tool generalizes voice-to-action translation, making it usable across diverse applications.
19	AI for Plant Growth Prediction	Create software that forecasts plant growth and health trends.	Agricultural planning depends on crop growth understanding. This AI tool predicts growth and health based on environmental and soil data, aiding farmers in optimizing yields.

20	AI-Enhanced Video Analytics Tool	Develop software to detect objects, motions, or anomalies in video feeds.	Video surveillance generates vast data, often left unanalyzed. This tool uses AI to detect objects, motions, or anomalies for timely interventions in real-time video feeds.
21	Autonomous AI-Powered Delivery Bot	Build a delivery bot combining sensors and AI for navigation and package delivery.	Urban delivery systems face challenges like traffic and delays. This bot uses AI for route optimization and autonomous navigation, ensuring efficient deliveries.
22	AI-Driven Smart Irrigation System	Develop a system to monitor soil and control water flow using AI predictions.	Over-irrigation wastes water and affects crop health. This system uses sensors and AI to assess soil moisture and weather, ensuring optimal water usage.
23	AI-Based Indoor Air Quality Monitor	Create a device and app combo to track air quality and suggest corrective actions.	Poor indoor air quality affects health. This monitor detects pollutants and uses AI to recommend ventilation or purification measures.
24	Health Monitoring and Alert System	Design a wearable that tracks vitals and alerts users via a mobile app.	Health emergencies often go unnoticed. This system monitors vitals like heart rate and oxygen levels, sending real-time alerts when anomalies are detected.
25	AI-Integrated Object Tracking Drone	Develop a drone that autonomously tracks objects using real-time AI analysis.	Object tracking is critical for surveillance and rescue missions. This drone combines sensors and AI to follow objects dynamically, ensuring adaptability in complex environments.