KONGU ENGINEERING COLLEGE

TRANSFORM YOURSELF

(Autonomous)

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Perundurai, Erode - 638 060, Tamil Nadu.

Association of Electrical and Electronics Engineering

Academic Year:2025-2026 Semester: Even

ELECTROTHON 2K26

SOFTWARE PROBLEM STATEMENTS

PS ID : 1

CATEGORY: Software

TITLE : ChargeSense – Smart EV Log Analysis Platform

For detailed description use this:
https://drive.google.com/file/d/1tb0dFgkICglp_2bWIMkhlqsItK4-5BCl/view?usp=drivesdk

Electric Vehicle (EV) charging stations generate log files that contain information about charging activity, charger status, power usage, and error conditions. These log files are recorded as raw event data, which makes them difficult to read and understand directly. Because of this, operators struggle to quickly know whether chargers are working properly or why charging sessions fail. This leads to slow fault detection and inefficient use of charging infrastructure.

The goal of this project is to build an automated system that can read raw EV charger log files and convert them into clear and useful information. The system should group related log entries into complete charging sessions, identify whether each session was successful or failed, and find common reasons for failure. It should also analyze the performance of each connector and allow users to ask simple questions about charger behavior and receive answers based on the data.

Sample EV charger log files will be provided to participants on the day of the hackathon

Technology Requirements:

- The system should support the following:
- Input log files in CSV, Excel, or JSON format.
- Processing of EV charger (OCPP) log data.
- Grouping event records into complete charging sessions.

- Session-wise and connector-wise performance analysis.
- Generation of summary statistics and insights.
- Natural-language question answering using NLP techniques.
- Implementation using suitable technologies such as Python, JavaScript, data analytics, and visualization tools.

PS ID : 2

CATEGORY: Software

TITLE : VisionForge – AI-Based CNC Inspection Software

In manufacturing industries, metal plates and angles produced by CNC machines must be inspected to ensure their dimensions and hole positions match design specifications. Traditional inspection methods depend on manual measurement or specialized hardware, which are slow, prone to human error, and difficult to scale for large production volumes.

The objective of this project is to develop a purely software-based inspection system that can analyze digital images or synthetic data of CNC-machined metal components and automatically measure their key dimensions. The system should identify the size of the component, detect bolt holes, and verify their positions using only software techniques. Participants are required to design and implement the complete solution independently, including data generation or image preparation, without relying on any pre-provided datasets. This approach encourages innovation in algorithm design, robustness, and practical problem-solving using software alone.

Technology Requirements:

The system should support the following:

- Software-only implementation (no physical hardware required).
- Input through self-generated images or synthetic component data (datasets will not be provided).
- Image processing and shape detection to identify component boundaries and holes.
- Measurement of length, width, and hole spacing using reference scaling.
- Tolerance checking and PASS/FAIL decision logic.
- Output of measurement values and inspection results.
- Implementation using Python or C++.
- Use of libraries such as OpenCV, NumPy, and Matplotlib (or similar).
- Optional graphical interface for visualizing detected edges and measurements.