PAAVAI ENGINEERING COLLEGE

(AUTONOMOUS)

TECHFINIX'26

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGNEERING

POWERAI

Faculty Coordinator: Dr.S.Siddik,AP/EEE Faculty Number:99405327994	Student Coordinator :M.Sanjay prasanth IV Year /EEE Student Number :8610178709

Objective

- Integrate AI/ML with electrical systems
- Solve real-world power & energy problems
- Promote innovation, coding, and system design skills

Team Details

Team size: 2-4 members

Open to: EEE, ECE, MCT, R&A, BME.

Coding + Electrical knowledge preferred

Duration - 1 Hours Hackathon

Problem Tracks (Participants choose one)

1. **Smart Grid Intelligence**
   - Load forecasting using AI
   - Fault detection in transmission lines
   - Demand-side energy management
2. **Electric Vehicle Intelligence**
   - Battery State of Charge (SOC) prediction
   - AI-based Battery Management System (BMS)
   - EV charging optimization
3. **Renewable Energy Optimization**
   - Solar power prediction using MI
   - Wind energy forecasting
   - Hybrid renewable system optimization
4. **Industrial Automation**
   - Predictive maintenance of motors
   - Fault diagnosis in transformers
   - Smart PLC automation using Al
5. **Smart Energy IoT Systems**
   - Smart home energy management
   - IoT-based load monitoring
   - Energy theft detection

HACKTHON ROUND

Round 1: Idea Pitch

- Problem statement
- Proposed AI solution
- Expected outcome

Shortlisting based on innovation & clarity

Round 2: Development Phase

Participants must build:

- AI model (MATLAB)
- Simulation / hardware (optional)
- Dataset processing

Tools allowed:

• MATLAB/ Simulink

Round 3: Final Demo & Presentation

- Live demo/ working model(Optional)
- Results & accuracy
- Real-world application

Winning Criteria

- Innovation & Problem Clarity
- Accuracy & Performance of the AI Model
- Working Model/Live Demo Impact
- Presentation Quality & Team Dynamic

ELECTRO DRIVE

Faculty Coordinator; Mr.R.Satheehkumar,AP/EEE Faculty Number: 9500593108	Student Coordinator: K.Sakthivel IV Year /EEE Student Number :: 9942286115

Event Overview

A challenging and interactive technical event where participants solve MATLAB-based problems, coding challenges, and logical puzzles to progress through multiple levels and reach the final challenge

Objective

- Test MATLAB programming and problem-solving skills
- Improve logical thinking and algorithmic approach
- Develop familiarity with MATLAB commands and functions
- Encourage teamwork, time management and technical creativity

Team Details

- Team size: 1 member
- Open to all departments
  Duration-60 minutes

Event Format

Participants move through multiple levels, with each successfully solved challenge unlocking the next level.

Round 1: MATLAB Basics

Simple MCQs /output prediction / command-based puzzles:

- MATLAB interface and basic commands
- Variables and data types
- Operators
- Vectors and matrices
- Basic mathematical functions

Correct answers reveal the first clue / next challenge.

Round 2: Circuit Drive (Electric Circuit Analysis)

Transient analysis, nodal/mesh equations, and AC resonance using MATLAB scripts.

Tasks:

- Solve RLC transient responses (v(t),i(t)) given step/impulse inputs using differential equations or Laplace transform scripts (step, impulse, tf).
- Calculate maximum power transfer and frequency response/resonance points for a multi-mesh network.

Output values/plot features provide the password string to unlock the Round 2 Simulink source files.

Round 3: Power Matrix (Power Electronics)

DC-DC Converters, Inverters, and Harmonic/Ripple Analysis in Simulink.

Tasks:

- Bug Fix / Debugging
- PWM & Inverter Analysis

Verified steady-state output waveforms

Participants must:

- Analyze the given problem
- Develop the MATLAB solution
- Obtain the correct output

Winning Criteria

- Fastest completion time
- Number of correctly solved challenges
- Correctness of final MATLAB solution
- Team coordination and problem-solving ability

Volt Quest

Faculty coordinator: Mrs.G.Vishalakshi, AP/EEE Faculty Number: 6374058052	Student Coordinator: M.Santhosh IV Year /EEE Student Number: 9597370543

Event Overview

A thrilling problem-solving event where participants solve electrical & electronics-based clues to navigate through locations and unlock the final treasure.

Objective

- Test technical knowledge + logical thinking
- Improve team coordination & time management

- Make learning interactive and fun

Team Details

• Team size: 1 member

• Open to EEE, ECE, MCT, R&A, BME.

Duration - 60 minutes

Event Format

Participants move through multiple levels, each unlocking the next location.

Round 1: Electrical Basics

Simple MCQs/ puzzles:

- Ohm's Law
- Circuit symbols
- Units & conversions

Correct answers reveal first clue/location

Round 2: Circuit Puzzle

- Identify output of a given circuit
- Find missing component

Answer gives next clue

Round 3: Riddle + Concept

Example:

"I reduce voltage but increase current, who am I?"

Answer: Transformer

Winning Criteria

• Fastest completion time

Number of correctly solved challenge