

2025 IEEE University of Leicester Student Branch Circuit Design Contest (CDC'25) — Second-Stage Guidelines

Organised by:

IEEE University of Leicester Student Branch
IEEE PELS University of Leicester Student Branch Chapter
Circuit Design Contest Executive Committee (CDCEC)

In consultation with:

Dr. Bing Ji, IEEE University of Leicester Student Branch Counsellor
Prof. Paul Lefley, Honorary Chair, Principal Engineering at Collins Aerospace, UK
Dr. Eduardo Sato, Honorary Co-Chair, Power System Leader at United Kingdom Atomic Energy Authority (UKAEA), UK

Co-sponsored by:

IEEE UK and Ireland Section Power Electronics Society
IEEE UK and Ireland Section Industry Application Society
IEEE UK and Ireland Section Woman-in-Engineering Affinity Group
IEEE UK and Ireland Section
IEEE Region 8

Industrial sponsors: EasyEDA

Key Dates:

Official Launch: 01/Apr/2025
Registration Deadline: 14/May/2025
Preliminary Review Submission Deadline: 15/May/2025
Final Submission Deadline: 04/July/2025
Final Judging and Awards: 15/July/2025

Contact Information:

For queries or support, please contact:
Mr. Chen Yao on behalf of CDCEC
Chair of IEEE University of Leicester Student Branch

IEEE Circuit Design Contest — Second-Stage Guidelines

Terms and Conditions:

CDCEC reserves the sole and exclusive right of final interpretation and decision-making authority regarding all aspects of the competition. All participants acknowledge and accept this condition upon entry.

Dear Participants,

We warmly welcome your interest and participation in the “Next-Generation Energy System Design for Electric Vehicles” competition!

In today’s era where new energy, green development, and sustainability are highly emphasized, electric vehicles are rapidly emerging as a key sector across transportation, logistics, and industrial applications. The efficient, safe, and reliable operation of electric vehicles relies heavily on innovation and optimization of their energy systems. This competition focuses precisely on this critical area, aiming to gather innovative ideas and explore possibilities for the next-generation energy system.

To provide clearer guidance and help you focus on technically valuable directions, we hereby release this supplemental guideline, emphasizing one recommended focus area: Digital Power Systems.

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Key Focus: Innovation in Digital Power Applications for Electric Vehicles

Participants are strongly encouraged to focus on developing digital control-based solutions using MCUs or DSPs to tackle real-world challenges in energy conversion, transmission, and management within electric vehicles.

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Why Digital Power Matters

- Driving technological frontiers
- Enhancing system performance
- Enabling intelligent and reliable operations
- Managing complex operational scenarios

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Suggested Project Directions

Projects must reflect the application of digital control techniques. Examples include, but are not limited to:

- Low-power DC-DC converters
- Battery active balancing systems
- Energy management algorithms
- Digitalized AC-DC modules
- Communication interfaces (e.g., CAN protocol)
- Fault detection and predictive health monitoring

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Hardware Practice and PCB Requirements

All hardware projects requiring PCB fabrication must use JLCPCB and include the official competition logo.

Expected Deliverables

- Full technical report
 - Simulation results and analysis
 - Source code with documentation
 - PCB schematics and fabrication files (if applicable)
 - Testing results and hardware demonstration (optional)
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Compliance with Trusted Research

This competition is an extracurricular educational activity.

It does not involve research or development of any controlled military or dual-use technologies that would require export control licenses.

All projects are civilian-oriented, with a focus on low-power applications, engineering education, and skill development.

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IEEE POWER
ELECTRONICS SOCIETY
Powering a Sustainable Future



IEEE INDUSTRY
APPLICATIONS
SOCIETY
Linking
Research
to Practice



Appendix

Event websites

University of Leicester IEEE Student Branch website: <https://www.uolieee.org/>

EasyEDA website: <https://easyeda.com/>

EasyEDA Video tutorial:

https://youtube.com/playlist?list=PLbKMvtYbdPPUywy5XyfPVcFcH8Eho_hS&si=Cx9CaJWhKjRd8pV7

EasyEDA Tutorial page:

<https://prodocs.easyeda.com/en/>

Contact Information

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