ESTC 2026 Student Competition

Predictive Modeling and Design Optimization for Advanced Electronic Packaging

Overview

Dear Students,

We are excited to announce a new student competition for the upcoming 11th ESTC conference that will be held between September 09 – 11, 2026 in Helsinki, Finland. This is a great chance for you to showcase your skills, present your innovative ideas, and compete with other students from all around the world. Eligible participants can be undergraduate (BSc) and master's (MSc) students from any university and should be enrolled in an academic program during the 2025-2026 academic year. Up to 10 finalists will be invited to participate in the upcoming 11th ESTC conference in Helsinki, Finland.

Motivation

The field of microelectronics/photonics packaging and advanced packaging is crucial for the future of electronic components and systems. Independently, if we consider mobile phones, data centers, automobiles or healthcare equipment, all these applications strongly depend on electronic systems. Microelectronics packaging and advanced packaging are the cornerstone of innovation in all industry segments. As new packaging technologies, materials, and processes emerge, a skilled workforce is required to push further technological advancements.

Benefits

Participants:

- Discover exciting career paths in microelectronics and photonics packaging
- Gain insight into state-of-the-art packaging technologies and emerging industry trends

Finalists:

- Gain visibility with industry professionals and technical leaders attending the conference
- Attend the conference with travel and participation costs covered, subject to the available competition budget and organizer policy
- Showcase creative thinking, engineering judgment, and technical problem-solving through a realistic reliability case study
- Build professional networks with potential employers and explore internship and career opportunities at global technology companies

Competition Rules and Process

The competition is open to undergraduate (BSc) and master's (MSc) students currently enrolled in an academic program at any university. Participation is team-based, with teams consisting of 1 to 3 students. Each student must submit an individual registration form and specify team affiliation.

Participating students

We encourage students from various disciplines related to the reliability and simulation of electronics packaging, co-packaging optics, materials science, mechanical engineering, and related disciplines to join and showcase their talents in front of academia, research, and industry leaders. This opportunity allows participants to demonstrate their skills, apply academic knowledge, and collaborate on innovative ideas in the field of electronic packaging.

The competition is divided into three phases.

Phase 1: Registration	Each student must register for the competition by **May 15, 2026,** by completing this form: ESTC 2026 Student Competition Registration.
Phase 2: Report Submission	Each team will submit their report for evaluation by **May 31, 2026**. The report should not exceed 6 pages and must use this template: 76th_ectc_student_competition_template.docx

The organizing committee will evaluate eligible submissions and select the top-ranked teams (up to 10 students) as finalists, who will be invited to attend the 11th ESTC 2026 Conference.

Phase 3: Final Presentation	Selected finalists will present their work on-site during the conference.

Finalist students

IEEE EPS will provide financial support covering conference registration, hotel accommodation (September 09–11, 2026) and economy-class airfare **(up to $2,000 per participant for intracontinental (Europe) flights and up to $4,000 for intercontinental flights).** Students will reimburse their expenses through IEEE EPS after the conference up to the mentioned limit. Students requiring a visa are advised to begin the application process as soon as they are notified. **Although the organizing committee cannot provide visa assistance, it will provide a letter confirming the students' finalist status and invitation to present at ESTC in Finland.**

Finalists must prepare their presentations by **August 15, 2026**. At the conference, they will present their work in a dedicated session to top leaders from academia, research, and industry, receive feedback, and explore career opportunities in electronic and advanced packaging.

Competition Topic

This competition invites students to work on a realistic reliability engineering problem inspired by automotive electronics. Participants will analyze how thermal expansion mismatch between package and PCB can drive damage accumulation in BGA solder joints and will propose an improvement strategy grounded in simulation results.

Key Technical Focus

- Thermal expansion mismatch between package materials, solder joints, and PCB.
- Stress and strain distribution during thermal cycling.
- Fatigue damage accumulation in critical BGA joints.
- Engineering comparison of design options under realistic constraints.

Detailed technical case and boundary conditions are provided in the companion slide deck:
ESTC 2026 Student Competition – Technical Subject Overview.pdf

Competition Subject Brief

Context	*NordicDrive*, a fictitious Finnish automotive manufacturer, has released a new generation of electronic control units for electric vehicles. Six months after launch, a major customer reports intermittent failures that later become permanent.
Issue	Initial failure analysis links the problem to BGA solder joints exposed to repeated thermal loading. The suspected root cause is thermo-mechanical fatigue during thermal cycling.
Mission	Investigate the failure mechanism and propose a design choice that improves reliability by at least 2x.
Task	Build a simplified package-PCB Finite Element Model; apply a thermal cycling profile from -40 C to 125 C; identify critical solder joints; evaluate design options to reduce fatigue damage.
Variables	Underfill material (2 variants) and selected material properties.
Constraints	Package geometry, PCB layout, and solder alloy (SAC305) shall remain unchanged.

Competition Calendar

Student registration deadline	May 15, 2026
Technical report submission deadline	May 31, 2026
Finalists' announcement (up to 10 students)	June 21, 2026
Presentations for the conference ready	August 15, 2026
11th ESTC Conference	September 09 –11, 2026

ESTC Student Competition Leadership Team

Marcel Manofu
Aumovio
marcel.manofu@aumovio.com

Iulian-Ionut Ailinei
Aumovio
iulian-ionut.ailinei@aumovio.com

Michiel van Soestbergen
NXP
michiel.van.soestbergen@nxp.com

Stoyan Stoyanov
Greenwich University
s.stoyanov@greenwich.ac.uk

Wilson Maia
Thales
wilson.maia@thalesgroup.com

Christopher J. Bailey
Arizona State University
christopher.j.bailey@asu.edu

Przemyslaw Gromala
Robert Bosch Kft.
pgromala@ieee.org

In case of any question, please contact us at: estc-competition@up-see.org