



2026 IEEE AP-S Student Design Contest

Innovating Automotive Antennas

Travel to the 2026 IEEE AP-S and win up to US \$1,500!

Join the 17th IEEE Antennas and Propagation Society (AP-S) Student Design Contest! Design a compact, multi-functional antenna system for automotive applications of your choice (e.g., Vehicle-to-Everything (V2X), Ultra-Wideband (UWB) for ranging, wireless power transfer, Tire Pressure Monitoring Systems, GNSS, Cellular, Wi-Fi, Bluetooth, etc.), propose a setup to demonstrate its utility, and provide educational material to explain it. The top 6 teams will receive travel funds to attend the IEEE Antennas and Propagation Symposium in Detroit, MI, USA, July 12–17, 2026, to demonstrate their working systems. 1st, 2nd, and 3rd place winners will be announced at the 2026 IEEE AP-S Awards Presentation during the conference and will receive cash awards of US\$1,500, \$750, and \$250, respectively.

Important deadlines (see next page) are **December 31, 2025, and May 18, 2026.**

Goal: Design a compact multi-functional antenna system for automotive applications of your choice and propose a setup for demonstration.

Specifications

- The demonstration setup must showcase at least two automotive applications of your compact, multi-functional antenna system for communications and/or sensing.
- Many low-cost RF circuits, modules, and even nano-VNAs are now commercially available. Teams can consider cleverly using these off-the-shelf components to build their system and the demonstration setup.
- If FCC regulations are an issue, ISM band frequencies may be used as a surrogate in the demonstration setup.
- Performance metrics/results must be displayed in real time, with easy visualization.
- The setup and procedure must be easy to understand for non-specialists.
- The setup must be easy to reproduce in a classroom.
- The teams must explain the theory behind their demonstration setup in a simple way, so that it can be understood by non-engineers.
- Provide step-by-step instructions to allow reproduction of the system for anyone who wants to use it for teaching purposes.
- Merit will be assigned to designs based on the following criteria, equally weighted:
 - Creativity and justification of the design and its application
 - Capability of the system to demonstrate multiple functionalities for at least two automotive applications
 - Quality of the experimental setup and results
 - Educational value and clarity of the DIY/demonstration instructions
- Existing licensed software at the university (e.g., electromagnetic simulation software) or free software may be used. Any other commercial software used for the project should be included in the budget. The total production cost for the entire system must be less than US\$1,500.
- Reference specifications from some popular automotive antenna applications (but are not limited to these):
 - GNSS L1: 1575 GHz (± 10 MHz), isolation from other transmit ports ≥ 15 dB, RHCP, hemisphere upward pattern
 - Cellular: major LTE bands between 700-2700 MHz, efficiency $\geq 35\%$, near omnidirectional in azimuth
 - V2X: 5.85-5.95 GHz, moderate gain (1-3 dBi), stable pattern toward horizon.

Eligibility

The team must consist of 2 to 5 students, and at least 50% of the team members must be undergraduate students by

the end of May 2026. For a 5-year Bachelor-cum-Master degree program, students in years 1 to 3 are considered undergraduates. Each team should be advised by one professional mentor who is a member of the IEEE AP-S, but the work needs to be done primarily by the students. No student or mentor should be involved in more than one team.

Application and Review Process

1. All applicants must submit a preliminary design by **December 31, 2025**. It must include:
 - a. A proposal in pdf limited to **four pages** and in 12-pt Times New Roman font that includes:
 - i) A detailed description of the demonstration setup and quantities to be measured and/or postprocessed.
 - ii) A detailed description of the antenna system to be built.
 - iii) A bill of materials (up to US \$1,500).
 - b. A letter from a professional mentor, such as a professor or engineer in industry, indicating agreement to supervise the project (the students being mainly responsible for doing the work). The mentor must be an AP-S member (please provide IEEE membership number) and must verify that all team members are graduate or undergraduate students at a university, college, or technical school.
2. The team of reviewers will assess each preliminary design based on the likelihood of achieving the design goal and the specifications, as well as the creativity of the project and the quality of the written materials. Six semi-finalist teams will be selected by **January 20, 2026**, and will receive US\$1,500 each to build and test their designs.
3. The six finalist teams will receive stipends of up to US\$6,000 per team to attend the IEEE AP-S Symposium. These funds will be provided upon the submission of their final materials and visa application confirmation letters. The stipend is intended to cover equipment shipping costs and all expenses for two team representatives (at least one of them must be an undergraduate student). This amount can be divided among multiple team members.
4. Each of the six semi-finalist teams must submit their final design by **May 18, 2026**, in the form of a video demonstration of the working system (≤ 10 minutes), step-by-step instructions to replicate the system (≤ 5 pages) in PDF format (≤ 5 MB file size), and a final report (≤ 5 pages) in PDF format (≤ 5 MB file size). Submission instructions for the video demonstration will be provided later (some videos from previous contests are available on YouTube – in the IEEE AP-S Student Design Contest Channel). The report should follow the two-column format of the IEEE Transactions on Antennas and Propagation and include:
 - i) Detailed description of the antenna system's capabilities for automotive applications.
 - ii) An easy-to-understand explanation of the theory behind the antenna system and the demonstration setup.
 - iii) A list of parts and materials required, including where to obtain them and costs.
 - iv) Photo(s) of the final system and demonstration setup.
 - v) Simulation and measurement results of the antenna system.
 - vi) Biographies (100 words or fewer each) and photos of all team members.
5. The finalists will be expected to demonstrate their working systems during the Symposium and attend the Awards Ceremony. Each team should bring all necessary equipment for the demonstration.
6. Several Design Contest Judges will be appointed to assess each design based on achieved performance, creativity, completeness of the description, functionalities of the system as determined by the video, educational values, and quality of written materials. The Design Contest Judges will assess the final demonstrations and take into account the final reports to select the 1st, 2nd, and 3rd prize winners, who will receive certificates and cash prizes of US\$1,500, \$750, and \$250, respectively. The prize winners will be announced at the Awards Presentation during the symposium.

How to Submit Materials

Proposals must be submitted by a student member of your team through the provided link <https://ieeeaps.wizehive.app/program/ieee-aps-sdc/info> or by using the QR code on the right. All submitted materials should be in PDF format, following the guidelines above.

For all inquiries, please contact shihyuan@ntu.edu.tw, using '2026 IEEE AP-S Design Contest TeamName' as the subject line. **Messages without this subject line may not be received.**

