FEATURES

Racing Against Time: Inside NTU Racing's Pursuit of Speed, Precision, and Reinvention

Intro-video of NTU Racing.

Raindrops fell steadily on campus the day National Taiwan University's racing team unveiled its latest electric Formula-style racecar.

Through the mist and puddles of Palm Avenue, a race car soared down the slick boulevard, slicing tight figure eights between rows of umbrella-grasping spectators. The crowd gasped as the orange, blue, and white machine accelerated and braked amid the downpour. The tricolor machine was called Epsilon 6, or EP6 — a racecar designed, built, and tested entirely by students of NTU Racing.

For the team behind its inception, development, and trials, the moment meant far more than a public demonstration or press conference; it marked the culmination of months spent shedding milliseconds, solving engineering failures, and mastering the art of persevering under relentless pressure.

NTU Racing's development base at NTU's ShuiYuan Campus.

Built in the Rain

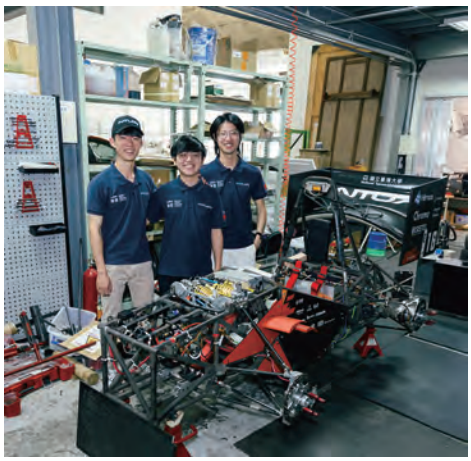
EP6 was completed in late June 2025 and immediately entered the Formula Student Taiwan (FST) competition at the Maxxis Proving Ground in Yunlin County in early July.

It rained there, too. "And, because the car is entirely electronic, we learned that waterproofing is critical," recalled team captain Wei-Zhe Hu. It was a painful lesson. During that day's competition, water seeped into the motor system, causing a malfunction so severe that the team had to withdraw from the endurance race.

That mishap notwithstanding, Formula Student Taiwan had served a crucial purpose: it was the proving ground before the team's ultimate challenge — Formula SAE Japan (FSAEJ), one of Asia's leading competitive collegiate racing events. By facing such challenges in the test drives, the team discovered the crucial weaknesses in EP6, made improvements, and refined the car's overall design before the real battles began.

By September, when the team arrived at Aichi Sky Expo in Japan, they again were welcomed by steady rain. By then, however, they had solved the waterproofing problem. But a more serious obstacle presented itself during the technical inspection. After completing the competition's static events — including business, cost, and design presentations — EP6 still had to pass a rigorous mechanical inspection before entering the grueling races.

The stern-faced judges raised safety concerns about the vehicle- - and initially rejected it.



From left to right: Team Captain Wei-Zhe Hu, former Team Captain Chen-Shuo Hsu, and Electrical Systems Leader Tai-Jie Wang.

NTU Racing's research on torque vectoring and traction control was published and presented at the SAE WCX 2026 World Congress.

The Team Strongly Disagreed

"It was a huge gamble," Hu said. "If the protest failed, we would lose a significant number of points." While some members hurriedly drafted technical arguments for the appeal, others prepared for the worst-case scenario, discussing emergency modifications that could be made on-site if necessary.

In the end, the chief judge accepted the team's appeal. EP6 was cleared to compete in its original form. On the rain-soaked track in Aichi, the car achieved the best result in team history: 11th place in the electric vehicle category, together with the JAMA Chairman Award and the Sportsmanship Award.

A Race Against Time — On and Off the Track

For NTU Racing, motorsport is as much about racing against time as engineering. "Racing is a sport obsessed with time," Hu declared. "The goal is not to build the perfect car. It's to build the best car you can before the clock runs out." That tension — between achieving perfection and meeting deadlines — creates constant pressure in the team's workflow. Members constantly innovate design tweaks for marginal improvements, pushing back production, only to find themselves scrambling at wit's end just before the race begins.

To foster synergy and speed up development, the team places enormous emphasis on the technical succession across generations of leadership. Each May, newly selected team leaders begin shadowing the team veterans, months before formal

handover of the baton takes place in September. The team also holds workshops on welding, carbon-fiber fabrication, and other manufacturing skills, so teammates from all academic backgrounds may participate in the engineering process.

Because NTU Racing draws students from across the university — not just engineering departments — not every member contributes directly to the vehicle design. But, understanding the development process allows everyone to apply their own expertise to the team's broader efforts. Former captain Chen-Shuo Hsu believes it is the team's interdisciplinary collisions of ideas that give NTU Racing its identity.

Evolving Designs, Unchanging Spirit

"Go the extra mile. Sky is the limit." This has been NTU Racing's motto since its inception. Both Hsu and Hu point out that there is no single right answer in engineering, meaning there is always room for improvisation and innovation. This is the shared vision of both team captains, which they instill in the team: take it one step at a time, and improve with every iteration.

Until 2024, the team operated out of an aging metal workshop of the Department of Mechanical Engineering. Tai-Jie Wang, electrical systems leader, lamented that the space had "no air conditioning or drinking water." During the summer, students often waited until nightfall to weld components because the daytime heat and humidity inside the building were unbearable. "It felt like we were working through the night and sleeping during the day," Wang recalled. The conditions were difficult, but they also reflected the team's seriousness and devotion.

Ironically, losing that workshop became an opportunity. After the old facility was demolished, the university helped the team relocate to a significantly upgraded research space on NTU's ShuiYuan Campus: the Advanced Vehicle Research Center.

Inside the new headquarters hang racing suits from previous generations alongside the skeletal frame of EP6, already evolving into its successor: EP7.

The next-generation car will retain EP6's torque vectoring system — an algorithm that controls vehicle dynamics while cornering — and upgrade its torque from dual motors to a four-wheel-drive configuration expected to significantly improve acceleration and handling performance.

For NTU Racing, every retired car becomes the foundation for the next generation.

Progress is measured not only in trophies, but in iteration, resilience, and the willingness to keep moving one more step further down the track.

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