

## **Electrical and Computer Engineering Department Claims 13th Victory at FIRA World Cup, Winning 9 Gold Medals in the Small Humanoid Robot Decathlon**

The Electrical and Computer Engineering Department's robotics research team from Tamkang University made history by claiming their 13th world title in the "HuroCup" small humanoid robot category at the 2024 FIRA RoboWorld Cup and Summit, held from August 5 to 9 in São Luis, Brazil. Participating in 9 of the 10 decathlon events, the team won gold in every event, achieving an unprecedented record of winning all entered categories for the first time in the team's competition history.

The robotics team, guided by Professor Ching-Chang Wong, Assistant Professor Chih-Cheng Liu, and postdoctoral researcher Yi-Chung Lin, competed in 9 events: Archery, Basketball, Marathon, Mini-DRC (robot rescue), Obstacle Run, Sprint, Spartan Race, Weightlifting, and United Soccer. Each event contributed points toward the overall decathlon rankings, making it extremely difficult to win the championship, as success in multiple events is essential. Each event had 2 rounds of competition spread over 5 days. The team strategically chose to forgo the long jump event to reduce motor damage, a tactic that successfully allowed the robots to complete all other events.

Professor Wong stated, "Winning the decathlon championship for the 13th time was made possible by the university's long-term support, which has consistently yielded outstanding results." He also expressed gratitude to alumnus Zhong-He Kuo, the chairman of Chuan Hua Precision Corporation, for donating funds to cover travel expenses, allowing students to compete in Brazil and bring honor to Tamkang University. Due to the high cost of round-trip airfare to Brazil—over NT\$100,000 per ticket—the team, initially consisting of 15 members, faced budget constraints and could not send everyone. They ultimately selected 7 members based on "team coordination," "expertise in competition categories," "responsibility for competition events," and "active participation in team activities" to represent Tamkang in Brazil.

Tamkang University's robotics team has been designing and developing small humanoid robots since 2004, participating in FIRA's small humanoid robot competitions. They won their first decathlon championship in 2007 in San Francisco, USA. The team designs and develops the robot's mechanics, circuits, and programs in-house. This year's competition used the 11th-generation small humanoid robot. Professor Wong noted that every competition event tests the robot's stability and various functions. The difficulty increases yearly, forcing teams to continuously enhance their robot's technology and creativity to complete the events.

FIRA and the Brazilian educational institution IEMA co-hosted this year's competition, attracting many local residents and students to watch. Unlike regular training and tests, the competitors had to perform under intense time pressure and in front of cheering crowds. The team was thrilled to break their record and win 9 gold medals. The student team members are as follows: Guan-Yu Chen (second-year master's), Pin-Chen Chou (second-year master's), Chi-Chia Chen (second-year master's), En-Tse Lin (master's graduate), Wei-Hsuan Chang (third-year master's), Hao-Jui Lu (master's graduate), Yan-Shiun Chen (senior), Chun-Kai Huang (senior), Pin-Ju Chen (senior), Hong-Jen Chen (senior), Wan-Rou Yeh (junior), and Yu-Hsin Chen (junior).

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The university's Electrical and Computer Engineering Department robotics research team and their

supervisors, Professor Ching-Chang Wong (far right), Assistant Professor Chih-Cheng Liu (far left), and postdoctoral researcher Yi-Chung Lin (back row, third from the left), pose for a group photo.



The Electrical and Computer Engineering Department won 9 gold medals in the “Small Humanoid Robot” Decathlon at the FIRA World Cup. The picture shows the obstacle avoidance event.



The Electrical and Computer Engineering Department won 9 gold medals in the “Small Humanoid Robot” Decathlon at the FIRA World Cup. The picture shows the weightlifting event.

The Electrical and Computer Engineering Department won 9 gold medals in the “Small Humanoid Robot” Decathlon at the FIRA World Cup. The picture shows the archery event.



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