2025 TIRT Autonomous Vehicle Maker Challenge

Competition Rules for Specific Group / Junior and Senior High School Student Group

Competition Regulations

A. Origins of the Project ： 2025.04.29

ShaYangYe is committed to advancing robotics education and promoting industry collaboration, with the aim of establishing Taiwan as an international stage for robotics competitions. Since 2018, we have collaborated with the Taoyuan City Government to organize the INTERNATIONAL ROBOTIC FESTIVAL IN TAOYUAN for seven consecutive years. This pioneering event brings together four major robotics competition fields: land, sea, air, and maker. Over the past seven years, it has attracted over 12 million participants both online and offline, with teams from 20 countries participating and a total of 10,750 teams from domestic and international regions. Our goal is to connect robot training and competitions with relevant industries, expand the international perspectives of Taiwanese participants, and create a cross-domain international robotics extravaganza that shines in Taoyuan and the world!For the 2025 INTERNATIONAL ROBOTIC FESTIVAL IN TAOYUAN, in order to promote Taiwan's robotics industry and self-made brands, we are planning a series of events, including the TIRT Autonomous Vehicle Racing Competition. This competition combines diverse control systems to showcase Taiwan's technological prowess in intelligent manufacturing. Furthermore, it serves as a link to the TIRT International Competition and Conference!

B. Objectives of the Project :

1. By organizing competition activities and facilitating learning exchanges, we aim to provide domestic and international teams with opportunities to observe and learn about programming, mechatronics integration, and knowledge sharing, thereby inspiring students' motivation to learn.

2. By incorporating diverse open control systems, we plan to design different competition targets that foster the development of students' creativity, design skills, integration abilities, and programming capabilities.

C. Guiding Organization：

Taoyuan City Government, Taoyuan City Council

D. Host Organization ：

Department of Economic Development, Taoyuan

E. Executing Unit ：

SHAYANGYE Cultural & Educational Foundation

F. Eligible Participants：

1. Students from junior high schools and senior high schools in all counties and cities nationwide.
2. International teams of the same age are also welcome to participate (proof of valid enrollment in their respective countries is required).
3. Participants must have a valid student status recognized by the Ministry of Education.

G. Competition events：

Autonomous Vehicle Maker Challenge - Specific Group

TIRT Official website.

H. Competition grouping ：

Junior High School Group: Open to elementary and junior high school students, with a maximum of 3 participants per team.

Senior High School/Vocational School Group: Open to senior high school and vocational school students, with a maximum of 3 participants per team.(The same team members cannot register for multiple teams. Any discovery by the organizing committee will result in disqualification.)

I. Event description and schedule planning ：

1. Registration Method： Visit the TIRT official website (https://www.tirtpointsrace.org/)
2. Registration Period： From May 20, 2025, to September 26, 2025 (subject to adjustment based on team registration status).
3. Competition schedule ： October 25, 2025 (Saturday).
4. Competition location ： SHA YANG YE Enterprise Co., Ltd. (No. 461, Taoying Rd., Taoyuan Dist., Taoyuan City). Please refer to the official website for any updates or changes.

J. Other matters：

The organizer reserves the right to modify the regulations and provisions of this competition. For any matters not covered, the latest announcements by the organizer on the official competition website shall prevail. If there are any inquiries or concerns regarding this program, please contact the organizer at telephone number 03-3623452, extension 5338 (Mr. Qin) or extension 5339 (Mr. Liu).

A. Eligibility：

2025.04.29

Participant eligibility is open to the Junior High School Division and High School/Vocational School Division. The organizing committee reserves the right to verify the eligibility of participants, and in the event of non-compliance with the competition criteria, the committee has the authority to revoke any awarded prizes and take legal actions against the disqualified team.

B. Competition Format：

1. The competition must be conducted using autonomous vehicles following a predefined track, and the race is conducted in a competitive manner.
2. Track definition: The main body of the vehicle must cover the track guide line (white line) in its projection, excluding dashed and shortcut sections.
3. The direction of travel must align with the track guide line (white line).
4. Failure to adhere to the track definition during the competition will result in disqualification.
5. The order of appearance will be determined by a random draw.
6. Each participating team has one opportunity during the competition to achieve a performance on the track (the number of opportunities may vary depending on the on-site registration and may allow changes to software and hardware). The official announcement by the judges on the competition day will be considered, and the best performance will be taken into account for scoring.
7. The finishing time of the teams is prioritized for ranking. If the number of teams that successfully complete the race (from the starting point to the finish line) is less than the number of winning teams, the teams with the farthest travel distance will be considered as substitutes. If all participating teams fail to complete the race, the ranking will be based on the distance traveled by the teams, and if the distances are the same, the ranking will be determined by the time performance.
8. The organizing committee will announce the practice time for the venue on the official website. Please pay attention to the information on the official website.

C. Vehicle Specifications for Participation：

1. The participating model must be made up of parts from the "CAGEBOT Technology Engineering Building Blocks" (including the main control board, drive motors, plastic building blocks, and metal connectors).
2. The vehicle should be wheeled. It should have two drive shafts at most and a random number of auxiliary wheels.
3. The main structure of the assembled vehicle must be made of plastic building blocks. The use of metal materials is allowed for structural connections.
4. The total length (including wheels) of the assembled vehicle in a stationary state should be less than 20cm. The total width (including wheels) should be less than 15cm. The total height should be less than 15cm.
5. The participating devices must obtain energy through self-carried battery power.

D. Competition Rules：

1. Competition Regulations：

a. All participants must complete the registration and check-in process. The race order will be determined through a draw, and teams must wait at the designated area according to the draw order. Once the vehicle has been checked and inspected, it must remain in the designated area throughout the competition and cannot be retrieved or adjusted during the race.

b. The competition vehicles must be started using hardware switches and cannot be activated through external connections to avoid suspicions of modifying the vehicle's program.

c. The competition order will be instructed by the relevant referees. Teams should enter the competition area in sequence. Only one team is allowed to compete on each track at a given time.

d. After the referees call out the team's name, one designated team member can bring the self-driving car into the competition area. When the referee announces the start of the race, the participant must place the self-driving car in the starting zone, ensuring that no part of the car crosses the timing start line.

e. Once the competition car is placed in the starting zone, the participant has one minute to make hardware adjustments and battery replacements.

f. The competition car must follow the specified track route and complete various challenge tasks along the way. The automatic timing will be done by the timing start line sensor, and the completion of the challenge tasks will be determined by the referees. After the referees confirm and record the results, with the participant's signature for confirmation, the participant can retrieve the vehicle and place it in the designated area, waiting for the announcement of the results.

g. In the event of disputes that cannot be resolved by the regulations, the decisions made by the referee panel will be final, and no objections will be allowed.

2. Disqualification Criteria：

If any of the following situations occur during the competition, it will result in disqualification. If the referee determines that the team has been disqualified, their finishing results will not be counted.

a. Interfering with the competition vehicle or modifying the robot's program without permission from the referees, from the completion of the registration process until the end of the race.

b. Engaging in behavior that disrupts the performance of other vehicles during the competition or any other violations of the regulations.

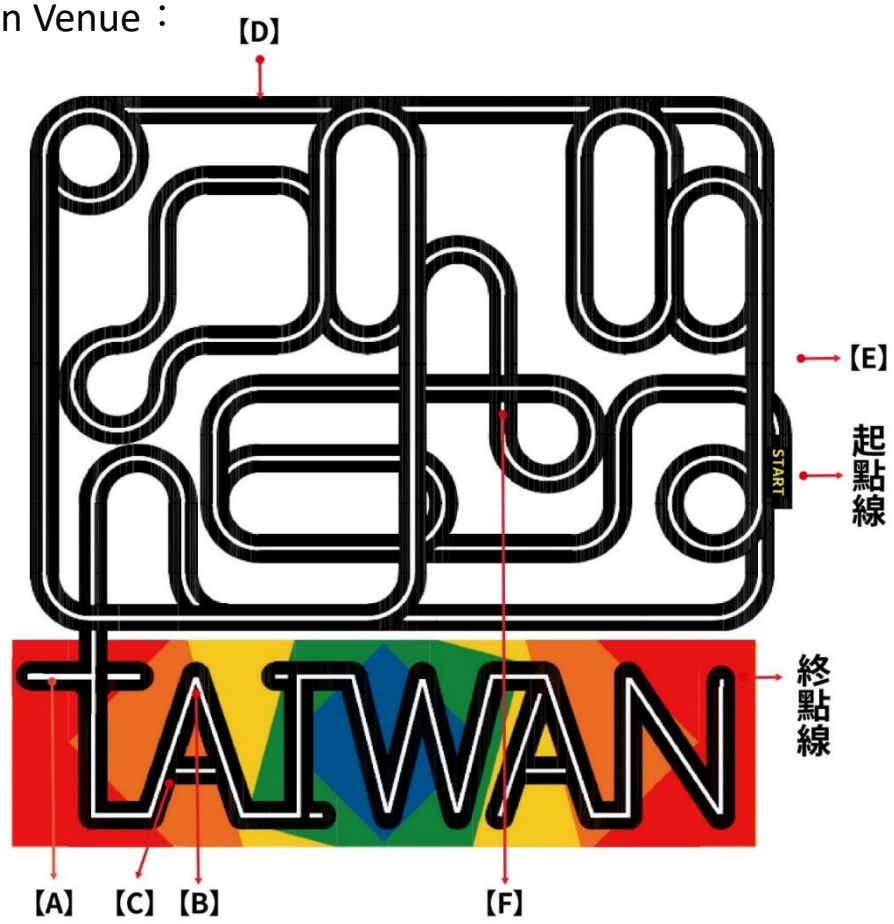
c. Any actions by team members or related individuals, such as the team coach, that are deemed by the competition referees to severely impact other participating teams.

d. Causing damage or significant contamination to the competition venue.

E. The track design consists of flat sections and inclines.

The track map is marked with a starting point, finishing point, straight lines, broken lines, curves (including acute angles, right angles, and sharp angles), and checkpoint indicators. Participants must follow the track design and drive autonomously, navigating through various checkpoints, until they reach the finish line.

1. Competition Venue：

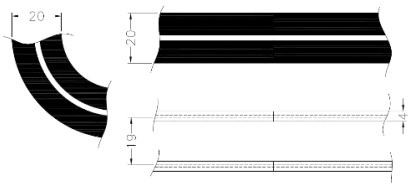


➢ **The placement and quantity of checkpoints will be determined by the judges on the day of the competition**

2. Challenging Obstacles：

Checkpoint Number and Name	Checkpoint Description	Diagram
Start Point and Finish Line	When the vehicle crosses the starting line (1), the timer starts counting, and when the vehicle crosses the finish line (2), the timer stops counting.	 

A. **【T-shaped Turn】**	Turn in the designated direction according to the specified rules while moving forward.	
B. **【V-shaped Turn】**	Make turns in the specified direction (with an angle less than 60 degrees) while driving.	
C. **【Shortcut】**	When taking a shortcut, participants must perform the action after passing the shortcut starting point (the shortcut starting line is used for illustrative purposes, and the referees on the day of the competition will determine the exact boundary).	
D. **【see-saw mechanism】**	This checkpoint features a fixed seesaw mechanism with a slope of 30 degrees or less. When the vehicle reaches a certain height on the ramp, the mechanism will instantly tilt downwards, creating a downhill slope. The placement of this ramp challenge will be randomly determined by the referees on the competition day.	 

E. **【Elevator Mechanism】**	Vehicles must stop at the stopping area of the elevator mechanism. Failure to stop will result in disqualification. After stopping, the mechanism will descend according to a fixed time. Once the descent is complete, the vehicle can continue to complete the race.	
【Three-dimensional track specifications.】	White line width of 2 centimeters.	

F. Scoring Calculation and Failure Determination

1. Score Calculation

Start from the timing start line and complete one lap to the finish line, recording the time performance. If a participant cannot finish one lap within six minutes, their score will be calculated based on the distance covered (incomplete laps will be recorded by the referee at that moment and cannot be appealed after the race).

a. Time Score Calculation：

1) Complete one lap from the timing start line to the finish line on the race track within six minutes.
2) The recorded time shown on the timer will be used as the basis for scoring.
3) In the event of any disputes that cannot be resolved by the regulations, the related decisions will be made by the referees, and no objections will be accepted.

b. Distance Score Calculation：

1) Distance Score Calculation Method: According to the judgment of the referee panel, for self-driving cars that are unable to reach the finish line, the final position of the center point of the driving axle will be recorded based on the team number. In the event of a derailment, the position of the center point of the driving axle at the moment of derailment will be recorded.
2) Derailment Definition: It is determined by the referee based on the orthographic projection from various perspectives. If any driving wheel of the self-driving car deviates from the black track and touches the colored map area, it is considered a derailment. (This does not apply to turns with an angle smaller than 60 degrees. Please refer to the illustration on page 4, section B - "V-Turn")

3) Calculation of Distance for Flat Track: The referee records the position relative to the center of the active wheel axle when the self-driving vehicle stops or derails. This information is recorded on the score sheet for distance calculation.
4) Calculation of Score for 3D Track: Numerical markers are placed on the outer side of each track section to determine the distance. If a team's vehicle stops or derails within the same marked section, the score is determined by the time taken (faster time wins).
5) If a self-driving vehicle loses power and remains motionless for 10 seconds after leaving the starting area, the score is calculated based on the distance.
6) If a team fails to reach the finish line within six minutes, the score is calculated based on the distance covered.
7) In the case of collisions with obstacles, the score is calculated based on the distance.
8) In the event of disputes that cannot be resolved by the rules, the referee's decision is final and cannot be contested.

2. Failure Judgment

In the event of the following situations occurring during the competition, it will be considered as a failed attempt, and the current round will end (the recorded score by the referee at that moment will be final, and no post-match appeals will be allowed).

a. If a team fails to enter the competition area within 30 seconds after being called three times by the referee, or if they are not ready to compete, they will be considered disqualified for that round.
b. Once the race begins, if a race car fails to leave the starting area within 10 seconds from the starting point, it will be considered disqualified.

G. Prize System

Ranking	Bonus (NTD)	Certificate
1st Prize	$5,000	V
2nd Prize	$3,000	V
3rd Prize	$2,000	V
Excellent Work	–	V