

I. Project Background:

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 six consecutive years. This pioneering event brings together four major robotics competition fields: land, sea, air, and maker. Over the past six years, it has attracted over 12 million participants both online and offline, with teams from 20 countries participating and a total of 9,400 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 2024 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!

II. Project Goals:

1. Through competition activities and study exchanges, provide domestic and international teams with opportunities to observe program design, mechatronics integration, and share experiences, in order to inspire students' learning motivation.
2. Integrating diverse open control systems, planning different competition objectives, and incorporating ways to expand students' creative abilities, design skills, integration capabilities, and programming skills.

III. Supervising Units:

Taoyuan City Government, Taoyuan City Council

IV. Organizer:

Department of Economic Development. Taoyuan

V. Implementing Unit:

ShaYangYe Charity and Education Foundation, Taoyuan City

VI. Participants:

1. High school, vocational school, and college students (including master's and doctoral students) from all counties and cities nationwide are eligible to participate.
2. **Participants must have a student status with a valid enrollment recognized by the Ministry of Education.**
3. International teams of the same age are welcome to participate (**proof of valid enrollment in their respective countries is required**).

VII. Event Categories:

Micromouse Maze Robot Competition



TIRT Official website.

VIII. Competition Grouping:

1. High school and vocational group: limited to high school and vocational school students for registration, with a maximum of 3 players per team.
2. College and university group: limited to college and university students (including master's and doctoral students) for registration, with a maximum of 3 players per team.

IX. Activity Description and Schedule Planning:

1. Registration method: Visit the TIRT official website at <https://www.tirtpointsrace.org/>
2. Registration period: From June 01, 2024 to October 28, 2024 (adjustments will be made based on team registration status)
3. Competition date: November 09, 2024
4. Competition venue: : The Taoyuan Arena (No. 1, Section 1, Sanmin Road, Taoyuan District, Taoyuan City)

X. Other Matters:

The organizer reserves the right to modify the regulations and rules of the event. For any matters not covered herein, please refer to the latest announcements by the organizer on the official competition website. In case of any doubts or inquiries, please contact the organizer at the following numbers: Mr. Chiu at extension 5334 (Tel: 03-3623452) or Mr. Qin at extension 5338 (Tel: 03-3623452).

I. Eligibility for Participation :

Players must have a valid enrollment status recognized by the Ministry of Education.

II. Vehicle Specifications for Participation: :

1. Robots must be able to operate independently without the assistance of remote control or remote computing methods. The robot's power source is limited to electrical power only.
2. Robots must be composed of plastic building blocks, with connectors allowed to use metal materials. The height of the robot must be less than or equal to 20cm, with no restrictions on length and width but must comply with the venue specifications
3. The robot's drive wheels must be mecanum wheels, and distance sensing components can only use LiDAR. Other similar sensing components such as ultrasonic, infrared, and camera sensors are not allowed.
4. **Competing robots must be equipped with the ROS (Robot Operating System) for program design and control. Both ROS1 and ROS2 systems are acceptable.**

III. Competition rules:

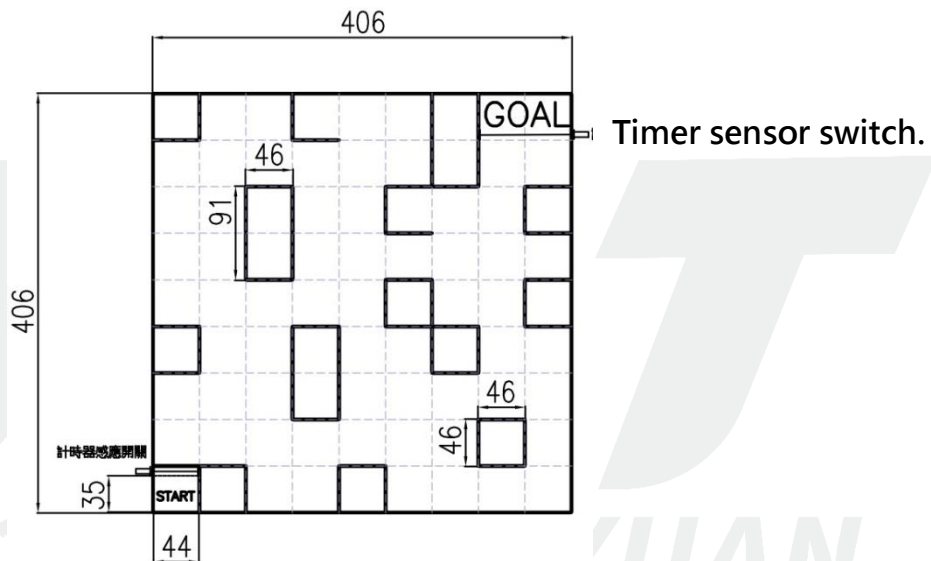
1. Each participating maze robot must start from the starting area and navigate autonomously to the finish line following the maze route.
2. In the competition, each maze robot has a time limit of 5 minutes. Within this time limit, the maze robot can make up to (and including) 5 attempts starting from the starting point. The organizers reserve the right to adjust the competition time and number of attempts according to the number of teams.
3. Before the official competition, the referee may randomly select several obstacles (each obstacle measuring 25cm*25cm*20cm) to be placed inside the competition arena. **The competition arena details are as outlined in Section 4.5 (the referee will choose one arena for the competition before the event).**
4. If the robot touches any part of the maze walls or obstacles during navigation, that attempt will be considered a failure, and the robot can restart the competition from the starting point.

5. If the competition needs to be restarted, the robot must raise its hand to signal the referee when it is ready at the starting point. Upon referee approval, the robot can then proceed to start to enable accurate timing by the referee. Failure to follow this procedure will result in that attempt being considered a failure.
6. Any other parts of the maze robot may not be transferred to other competing teams during the competition.
7. If the finish line cannot be reached within the specified competition time, the distance will be calculated based on the number of grid squares closest to the finish line.
8. The starting point and stopping point of the robot are used to trigger the timing switch for timing. The referee also uses a stopwatch for auxiliary timing. In case of abnormalities with the automatic timer, the time measured by the stopwatch will be considered accurate.
9. The robot is not allowed to leave any items or markings in the competition arena during the competition.
10. The robot must navigate in accordance with the maze route and is prohibited from damaging the walls or running across the competition arena. It must follow the planned maze pathways.
11. Destruction of the competition arena and props or causing contamination is prohibited. Participants may lose their competition eligibility in severe cases.
12. Uncontrollable environmental factors such as lighting, temperature, humidity, ground levels, and relevant hardware spatial conditions are part of the challenges for participants. These factors do not affect the determination of a rematch and cannot be cited as a reason for protesting the competition format.
13. The referee has the final decision-making authority in the competition. If there are situations that cannot be explained by the regulations on the competition day, the organizing committee has the right to interpret, and the decision made by the head referee is final and cannot be disputed.

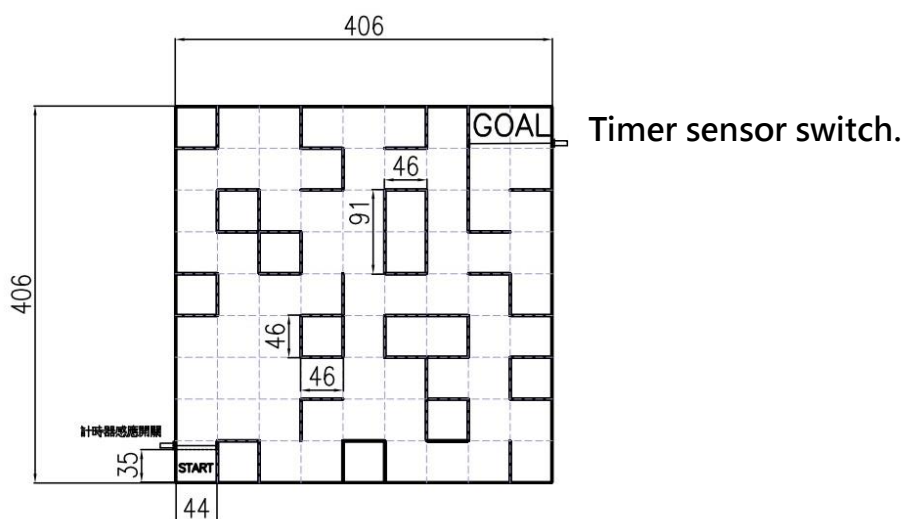
IV. Track and equipment instructions:

1. The maze is composed of square blocks with a size of 9x9, each block measuring 44cm*44cm (the external dimensions of each block are L 46cm*W 46cm*H 20cm). The maze walls have a height of 20cm, and the wall surfaces within the map are formed by blocks connected in any two-dimensional form.
2. The maze structure is made up of 1cm square aluminum bars and metal connectors, with the walls being opaque white in color.
3. The route map of the maze will be provided in a scanned file to the participating teams by the organizers in advance.
4. The surface material of the maze will primarily be the same as the floor material of the competition venue on the event day.
5. Dimensions of the venue: (proceed to provide the specific dimensions if available)

● (1)

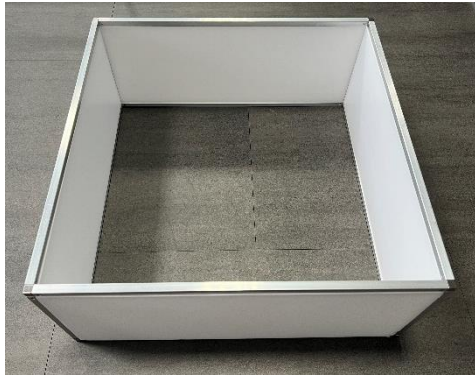


● (2)



★ The referee will choose a venue for the competition. 5

6. Maze block walls and obstacle diagrams.



a) Maze block walls (1)



b) Maze block walls(2)



c) Obstacle





V. Instructions for calculation of competition results:

Grade calculation method

1. The relevant score calculation is based on the best score of the 5 chances.
2. If a participant fails during the challenge, the player will obtain distance (in squares) and time scores at that point, which will be used for post-event score calculation.
3. If any team finishes within the time limit, the ranking will be based on the finish time in seconds. If the number of finishing teams is less than the number of winning teams, the team closest to the finish line in terms of the distance walked (in squares) will be substituted.
4. If all participating teams fail to finish, the ranking will be based on the distance walked (in squares) by all teams as explained above. If the distances (in squares) are the same, the ranking will be determined by the time score.

VI. Reward Mechanism :

High school and vocational group:

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

College and university group:

Ranking	Bonus (NTD)	Certificate
 1st Prize	\$12,000	V
 2nd Prize	\$8,000	V
 3rd Prize	\$5,000	V
 Excellent Work	-	V

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