



## Mouse - Labyrinth

Version 11 /2025

Official handbook 2026

RoboRAVE Greece

The slogan us : "Today's Play, Tomorrow's Pay."

## General information

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### 1.1 What is the Mouse - Labyrinth game?

The **Mouse Labyrinth** is one of the most unique and exciting challenges of RoboRAVE , inviting teams to design and program autonomous robots to navigate through a randomly generated maze. The goal is to navigate quickly and accurately, showcasing the participants' engineering and programming skills. Each maze has a different level of complexity, with the challenge becoming more demanding in the higher categories.

The mazes include turns, intersections and dead ends, making navigation challenging. Robots must be small and agile to overcome obstacles. The goal is to collect a piece of "cheese" and return it to the start. In the Universities category, the challenge is amplified, as robots are not allowed to touch the walls!

Don't miss the opportunity to showcase your creativity and skills in the world of robotics!

### 1.2 Who can compete on a team?

The Mouse Race Labyrinth has the following age categories:

- 1) Ages 11-14 (Middle School) - Born 2012-2015
- 2) Ages 15-18 (High School) – Born 2008-2011

Teams must consist of 2 to 4 members. Teams with more than 4 members will not be allowed to participate in the competition unless they register additional teams to comply with the regulations.

In the event that a category has fewer than 5 entries, the organizer has the right to combine age categories.

### 1.3 The specifications of the robot.

Robots must meet the following criteria to be eligible to participate:

1. **The total budget of the robot should not exceed 1500 euros.**
2. **Robots can be built from any platform or material.**
3. **Multiple sensors, motors, and processing units can be used.**
4. **The robot must operate exclusively as an autonomous system, without any remote control capability.**
  - The use of remote control devices or control cables to operate the robot is not permitted.
  - Programs can be loaded from external devices (e.g., laptop) during testing.
5. **The robot must be in a position to demonstrate a maze solving algorithm.**

- The algorithm must be adaptive and can be applied to different versions of mazes.
- It is not permitted to collect data, such as photos, scans , or other information related to the maze, before the start of the competition.

## 2. The race track

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### 2.1 What are the track specifications?

**Labyrinth challenge tracks** have been designed based on the following features:

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#### Base/Floor

The floor of the maze is a black square board, made of canvas or wood, measuring **134 cm x 134 cm** . This size includes the thickness of the walls, providing a stable and clearly visible background for the competition.

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#### Grid Configuration

The maze grid consists of **5 rows** and **5 columns** of squares, each measuring **25 cm x 25 cm** .

- The track is created by placing vertical dividing walls between the squares. The walls are placed randomly and by drawing lots.

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#### Wall Sections

The walls of the maze are made of MDF wood with dimensions:

- **Length:** 25 cm .
- **Height:** 20 cm
- **Thickness:** 1.5 cm .

The sturdy construction ensures durability and distinct boundaries for robot navigation.

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#### Start Area ( Start Unit )

The Start Area has a white "X" sticker with a diameter of **15 cm** , placed in its center.

- Both the Start Area and the Cheese Area ( Cheese Unit ) can be placed in any area within the maze.

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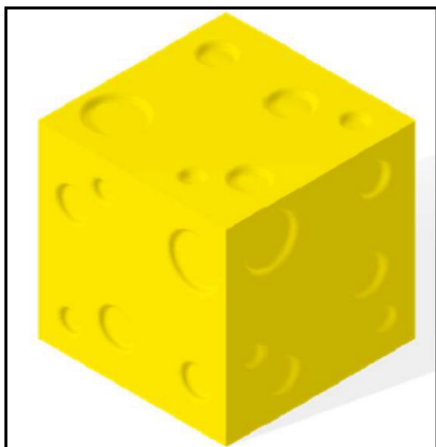
#### Unit Distances

The minimum distance between any two points (e.g. walls) is always **25 cm** , ensuring sufficient space for the robots to move.

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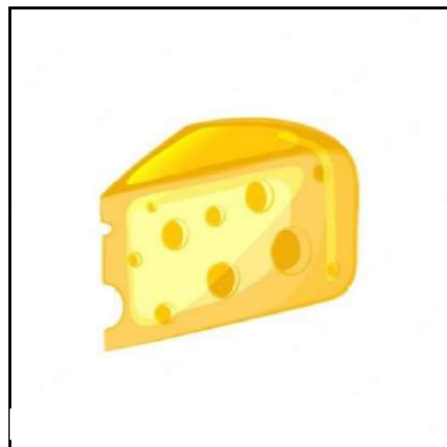
### Cheese Region Unit )

The Cheese Area includes a plastic yellow cube measuring **3 cm x 3 cm x 3 cm** , placed in the center of the unit.



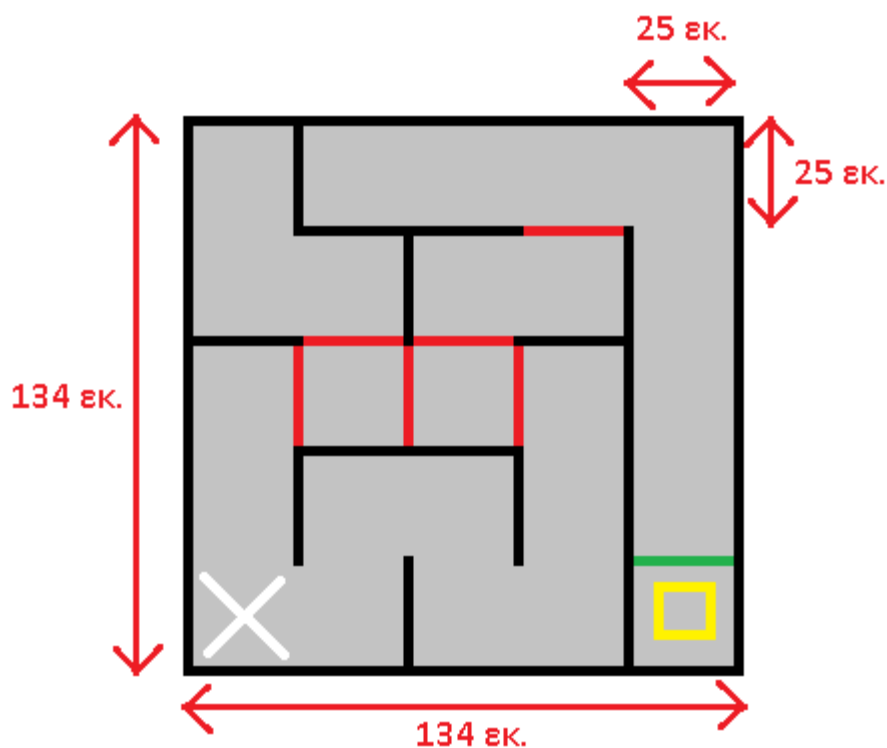
Τυρί από κομμάτια Lego 3x3 εκ.

Cheese made of Lego 3x3 cm



Παράδειγμα τυριού, όχι αντικείμενο της πίστας

Example of cheese, not a challenge material!!!



Παράδειγμα Λαβύρινθου

Example of maze

## 2.2 What are the obstacles on the track?

In **Mouse Labyrinth** , robots are challenged to face various types of obstacles, which vary depending on the category. These include:

1. **One-square dead ends:**

Dead ends that are one square long , which do not lead to the cheese.

2. **Double-square dead ends:**

Dead ends that are two squares long, which also do not lead to the cheese.

3. **T-Intersection : A**

unit where there are three available roads. A robot entering this unit has the option to choose between two directions.

4. **Crossroads ( Cross) Intersection ):**

A unit with four roads. A robot entering this unit has the option to choose between three directions.

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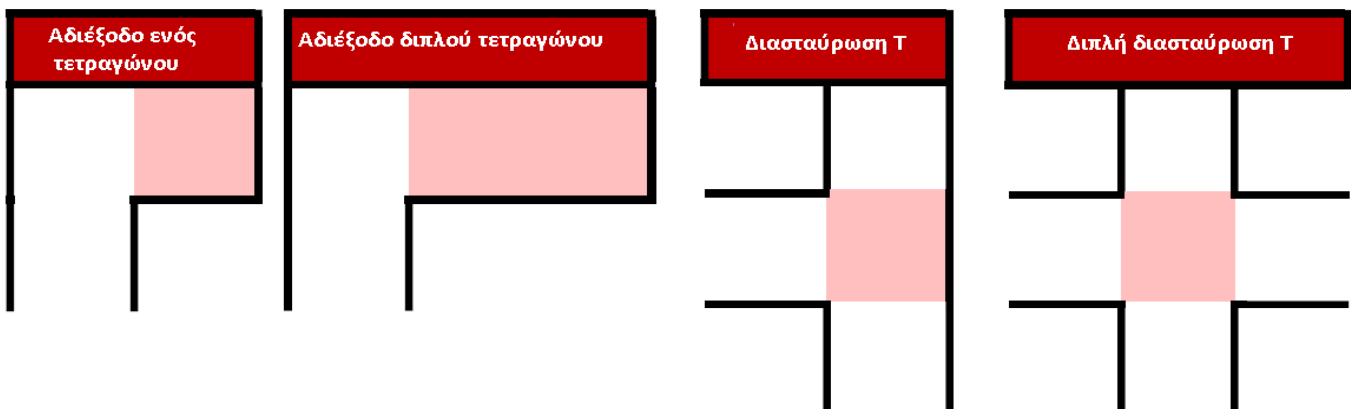
### Additional Information

- **Increasing Difficulty:** The number and complexity of obstacles increase in the higher categories, requiring a higher level of strategy and precision from the robots.
- **Start and Cheese Area:** In the higher categories, the **Start area ( Start Unit )** and **Cheese ( Cheese) Unit )** becomes more complex, potentially including multiple inputs or outputs.

One-square dead end    Two-square dead end

T-section

Double T-section



Τα εμπόδια στην πίστα

### Helpful Clues in the Labyrinth by Category

Competitors benefit from special signs that facilitate navigation on the track, adapted according to the category:

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## **Middle School and High School (MS and HS) Categories:**

### **1. Green Line:**

- A line of **2 cm thick green insulating tape** indicates the entrance to the **Cheese Unit ( Cheese Unit )** .

### **2. Red Line:**

- A line of red insulating tape **2 cm thick** indicates the entrance to a **T-Intersection** or **Cross Intersection . Intersection )** .
  - Both lines extend the full length between the walls separating the squares, providing clear guidance for robot navigation.

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### **Finished in all categories**

The robot finishes in the start area, where there will be a white “ X ” sticker. The robot must recognize the sticker and finish entirely within (all its vertical projections) the start square ( Start Unit ).

## **3. Competition procedure**

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### **3.1 How do the teams compete?**

- At the beginning of the competition and before the tests, a draw is held for the layout of the track and the **Start area Unit** .
- Students will have 60 minutes to train (program) their robot during testing.
- The track layout and the **Start area Unit** will remain the same throughout the day of the competition.
- Before the start of the qualifying round and the final round, a draw will be held for the **Cheese region Unit** .
- The Cheese area will be drawn in a line or column around the perimeter (outer) of the track and at least 5 blocks away from the start.
- Robots start from any point within the square Start as soon as the referee gives the signal and starts the timer.

**The robots have a total of 3 minutes to make as many trips as necessary to have a successful trip.**

### **1. Scoring Points:**

The team collects points as the robot moves through the maze until it reaches the **Cheese area Unit** .

### **2. Extra Attempts:**

If the robot fails to complete the route, it can try again. However, the time will continue to count until the game is complete.

## Termination of the Robot

### 1. Leaving the Cheese Area:

Once the robot enters the **Cheese Area ( Cheese Unit )** , can begin its return from the maze to the **Start area ( Start Unit )** . On the way back, it can carry or push the piece of cheese.

### 2. Collect Points on Return:

The team continues to collect points as the robot heads back to the **Start area Unit** .

### 3. Time Stop:

The timer stops once the robot successfully reaches the Start square for the first time, unless the team chooses to make a new attempt.

4. In case of a failed attempt, the team can choose to try again, in order to bring it back to the **Start area Unit** one new piece of cheese which the referee will have placed.

### 5. Robot and Cheese Reset:

If the robot needs to be manually returned by the operators to the **Start Unit** for any reason (stuck on the track, flipped over, etc.), the piece of cheese will be returned to the Cheese Unit, and the robot will have to re-enter the maze, with the clock continuing to run until the end of the 3-minute attempt.

## 3.2 What are the rules of the competition?

The following rules are applied by referees during official matches:

### 1. Compliance with the Rules:

- The referee ensures that the team and robot meet the criteria of rules 1.2 and 1.3.
- If the referee determines that any of the criteria are not met, the **Chief Referee is called** to decide the next steps.
  - Robots or teams that do not meet the criteria are usually not allowed to compete, unless necessary modifications are made according to the decision of the Chief Referee .

### 2. Race Duration:

- The match lasts up to **3 minutes** , as determined by the referee, and this is the only time during which the robot can accumulate points.
- The race is held on a pre-determined track. The track layout is revealed on the day of the competition.

### 3. Robot Launch Area:

- Robots are placed anywhere in the **Start area Unit** at the start of the match.

### 4. Rating:

The final score of the match is based on the time it took the robot to make a successful attempt during the 3 minutes of play.

### Return Robot to Start area ( Start unit ):

There are several reasons why a robot may be returned to the starting area:

- If a competitor touches the robot during the robot's movement.
- The referee may choose to end the match if the interference provides a significant advantage to the robot.

- With the referee's permission, competitors may return the robot to the **starting area** for any reason.

If the piece of cheese is moved, it is returned to the Cheese Unit.

#### 5. **Robot Handling:**

Only competitors may operate or interact with the robot during the competition.

Remember:

**"Players Play, Coaches Guide, Parents Encourage."**

## 4. **The scoring of the event**

Challenge	Maximum points per route		
	MS	HS	
4.1.1 On the way to the cheese	2 points for each square	2 points for each square	
4.1.2 Getting to the cheese	10 points	10 points	
4.1.2 On the return journey	1 point for each square	1 point for each square	
4.2.2 Returning to the beginning	10 points	10 points	
4.2.3 The cheese was received from the area of	20 points	20 points	
4.2.4 Cheese delivered to the start successfully	30 points	30 points	
4.2.5 Time remaining	1 point / second	1 point / second	

### 4.1 **Points Earned While Navigating the Labyrinth**

Points are awarded the first time a successful maze navigation is completed. A successful navigation is defined as autonomous driving, collecting the cheese, and returning to the starting area:

#### 1. **On the way to the cheese (2 points per square):**

- The robot earns 2 points for each square along the solution path it travels.
- The **solution path** is the shortest path between the **Start area ( Start Unit )** and the **Cheese area Unit** , excluding these two units.
- A square is considered scoreable when any part of the robot passes the points separating the squares.

#### 2. **Arriving at the Cheese (10 points):**

- The robot gains 10 points when it enters the **Cheese area Unit** .
- Entry into the area is confirmed when any part of the robot passes the points separating the squares.

### 4.2 **Points Earned upon Return to the Start Area**

Points for returning are awarded only after the robot has entered the **Home area** . Points are awarded the first time a successful navigation is completed:

#### 1. **On the return journey (1 point per unit):**



- The robot earns 1 point for each square along the solution path it travels on its way back to the **Start Unit Unit** .
- The **solution path** is the shortest path between the **Cheese region ( Cheese Unit )** and the **Start area ( Start Unit )** , excluding these two units.
- A square is considered scoreable when any part of the robot passes the points separating the squares.

## 2. **Returning to the beginning (10 points):**

- The robot earns 10 points if it reaches the **Start area Unit** .
- The robot is considered to have returned when any part of it is above the Start area.
- No points are awarded if the robot is returned manually.

## 3. **The cheese was received from its area (20 points):**

- If the robot removes the **piece of cheese** from the Cheese area, it earns 20 points.
- The cheese should not touch or be in the cheese area.

## 4. **The cheese was delivered to the start successfully (30 points):**

- If the cheese is successfully placed in the Start Area ( Start Unit ) at the end of the match, without any contact with the walls, the robot earns an additional 30 points.

In the event of a tie, the shortest navigation time until a successful attempt counts.

5. **Time (1 point/second):** Each second remaining on the timer at the end of the game is worth 1 point.  
Time points are only awarded to robots that have earned points for a successful Return.

## 5. Qualification and winner selection

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### 5.1 How the Top Teams Are Selected:

#### Finals Procedure

The finals are held at the official competition to determine the top teams in each category. The best teams compete live to determine the top team and the most effective robot. The qualification process for the **Mouse Labyrinth Finals** is determined as follows:

#### 1. Official Games

- Teams participate in timed matches on the day of the competition. The number of matches is determined by the Competition referee, with a minimum of **three matches** .
- a. An **official match** is any game officiated by a referee and with a recorded score.

#### 2. Choosing the Best Game

- For each team, **only the game with the highest score** of the day will be considered for qualification to the finals.

### 3. Qualifying for the Finals

- The teams with the **8 or 16 best scores** in each category advance to the finals.
  - In the event of a tie between two teams, **both teams** qualify.
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#### 5.2 How the final matches are held:

**Labyrinth Finals are held according to the following rules:**

1. **Competition of the Top Teams:**
  - The top teams in each division compete against each other in an additional set of matches.
  - Each team has only one chance to achieve the best possible route to the final ranking.
2. **Recognition of Achievements:**
  - All three positions receive awards, recognizing their achievements.

**"Think. Move. Conquer the Labyrinth!"**