INTERNATIONAL ROBOT OLYMPIAD

AI GUARDIANS

CREATORS

Be the Safe AI Guardian for tomorrow

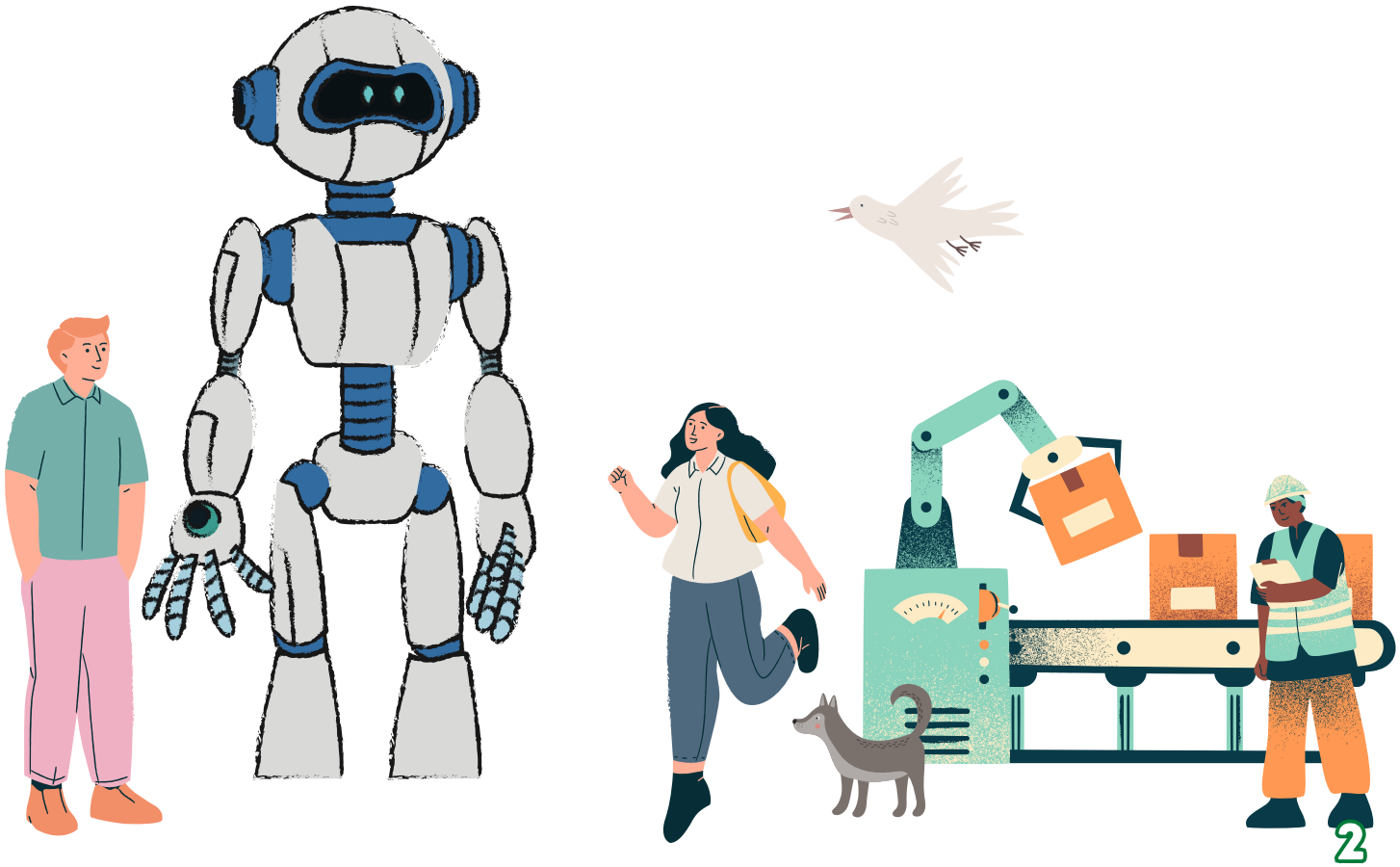
OFFICIAL RULEBOOK

WELCOME, CREATORS!

Creators of the future, welcome to AI Guardians!

Your mission is to design and program an autonomous robot that can safely navigate a mat filled with obstacles. The robot must detect and avoid all obstacles while moving efficiently from the start to the finish. Along the way, it will complete assigned tasks in designated zones. Your robot's intelligence, precision, and problem-solving skills will determine its success in completing the challenge.

Design, code, and strategize your way through each task. As creators, your performance isn't just technical – it's visionary.




CREATROS
IA

THEME OVERVIEW

Welcome to AI Guardians: Creators, a competition where your technical skills, ethical thinking, and creative problem-solving define the future of Artificial Intelligence.

This competition invites you to test your technical skills, creativity, and problem-solving as you design and program an autonomous robot to navigate a challenging obstacle course.

This year, your mission is to construct an AI Guardian – a robot that moves intelligently across a mat, avoids obstacles, and completes assigned tasks in designated zones. Each challenge reflects real-world problem-solving, requiring your robot to make decisions efficiently and safely.

Along the way, you'll explore core robotics and AI concepts like sensor-based navigation, obstacle detection, and autonomous decision-making, while managing constraints such as limited energy or movement efficiency – simulating how real autonomous systems must balance performance with reliability.

This competition is more than building a robot – it's about shaping machines that are smart, adaptive, and capable of handling real-world challenges with precision and intelligence.

COMPETITION COMPONENTS AND AWARDS' SPACES

🤖 1. Robot Game - Pages 6 to 18

- How well does your robot complete the missions?
- You'll get points based on your robot's performance on the mat.

👫 2. Team Motivation - Page 19

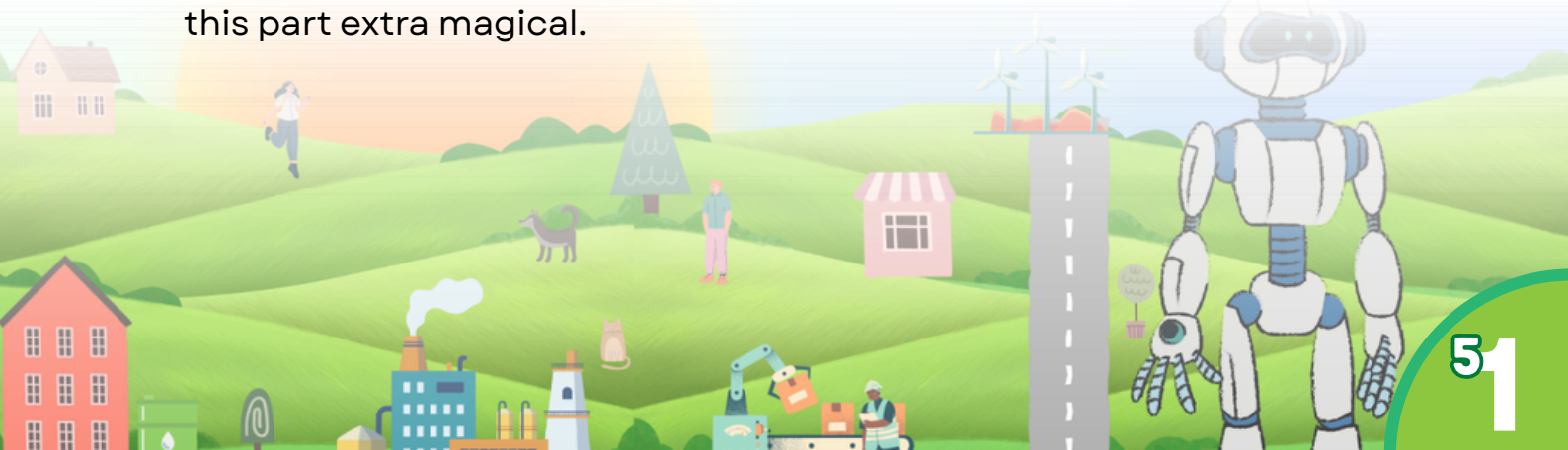
- Joining the AI Guardians challenge is more than just building robots; it's about personal growth.
- Judges will observe if you support each other, share tasks, and maintain positivity, even during setbacks.
- This is also an opportunity for more students to participate as part of "Cheerleading" teams

💡 3. AI Invention Proposal - Page 20

- What's your big idea for using AI to help people in the real world?
- Your team can create a simple drawing or short explanation for a new AI invention – maybe a robot that helps kids learn, keeps the planet clean, or keeps people safe!

🎤 4. Team Presentation - Page 21

- Can you explain your robot and your Invention proposal impressively?
- You'll talk about your robot design, your code, and how your team made decisions. Clear drawings, fun ideas, and great teamwork make this part extra magical.



🤖 1. Robot Game

ROBOT DESIGN & STRATEGY

In this challenge, it's not just about what your robot does – it's also about how you build it, plan it, and make it better. You'll get to share your ideas and tell the story of your robot!

You should:

🤖 **Talk about your robot's design** – what makes it special and how it helps with the missions.

💡 **Explain your code** – how your robot knows when to move, turn, or stop.

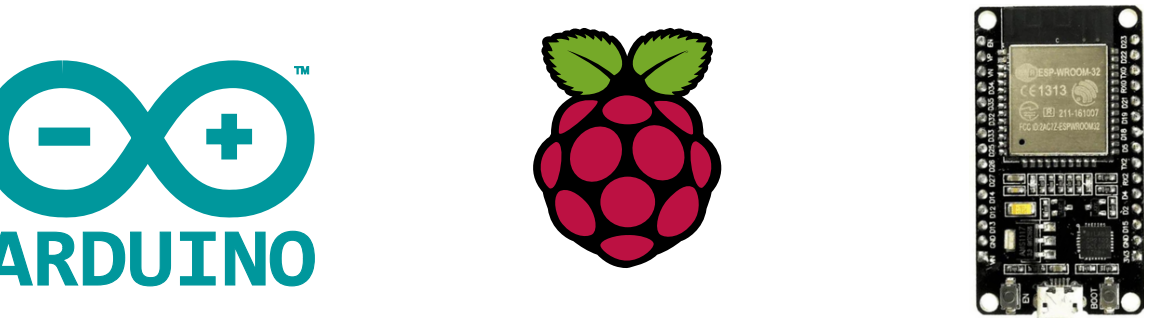
📋 **Share your plan** – How you approached each mission.

🔧 **Keep testing and improving** – it's okay to make mistakes, just learn from them and try again!

👫 **Show how everyone helped** – building, coding, planning, and testing together as a team.

ROBOT SPECIFICATIONS

Your team will work together to design and build a robot using one of the following Robotics kits.



Robot Constraints:

- Must be entirely autonomous (no remote control).
- Your robot is allowed to use a **maximum of 4 motors and 1 controller.**
- Your robot size should be within 30cm × 30cm × 30cm.
- **No replacement** of attachments are allowed within the matches.

ROBOT GAME

Challenge Format

- **Objective:** Each participant will guide their autonomous robot to complete as many of the missions as possible on the mat.
- **Time Limit:** Each participant has 4 minutes to complete the tasks. Efficiency and precision are key – the faster and more accurately your robot completes the missions, the higher your score.
- **Scoring:** Performance will be evaluated based on accuracy, efficiency, and time taken to complete each mission.

Mission 1: Obstacle Navigation Challenge

Your autonomous robot must move through the mat full of obstacles, detecting and avoiding every hazard in its path. Each obstacle you successfully navigate adds points to your score, so plan your route carefully and keep your robot safe!

Mission 2: Patrol and Protect

Guide your robot around the mat in a complete loop, ensuring all zones are “secured.” Pause briefly at each marked area to simulate scanning for threats – your robot’s precision and speed will determine how well it protects the territory.

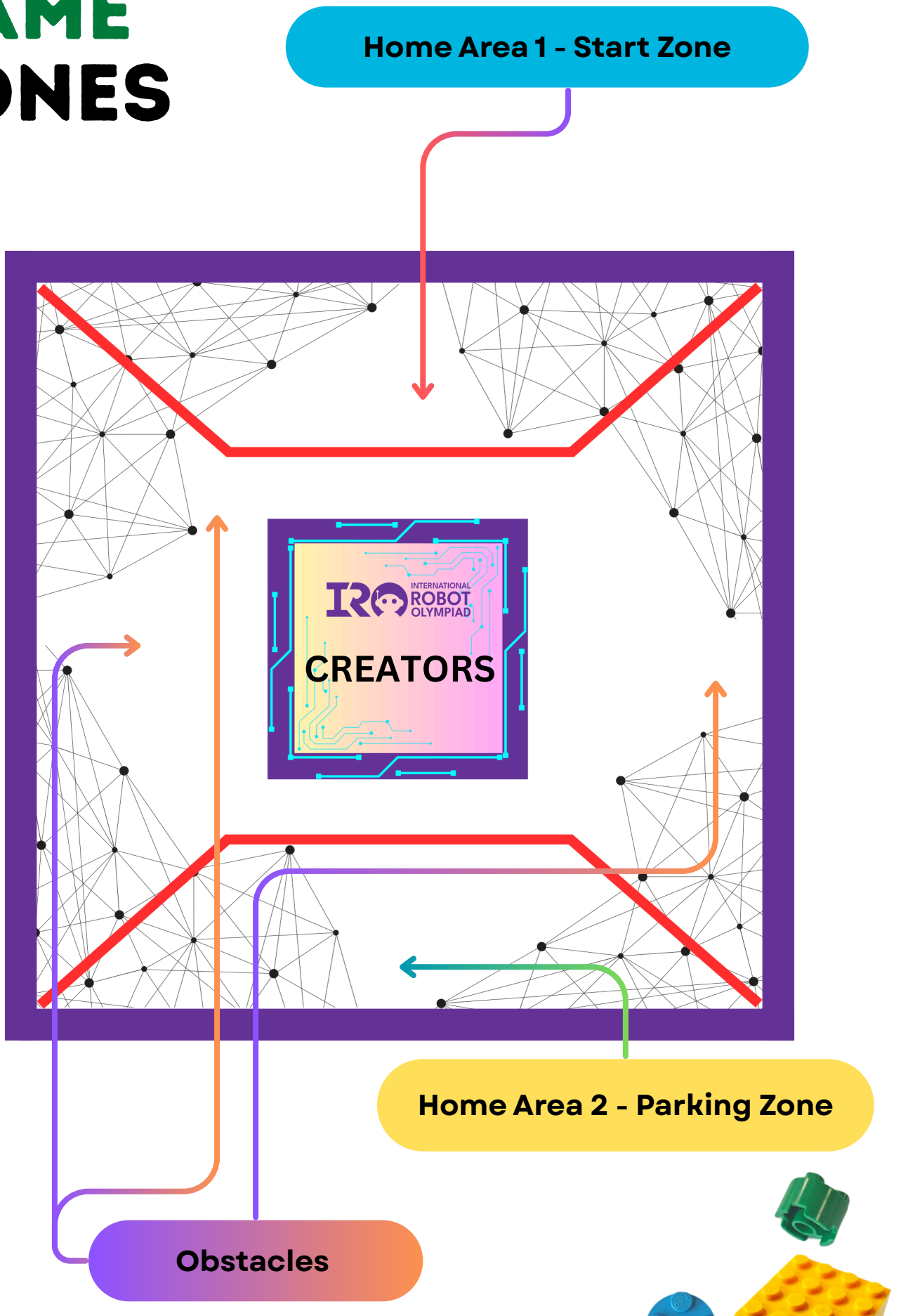
Creators Challenge: Emergency Response

Unexpected obstacles can appear at any moment! Visit the Safety Check Zone frequently to detect and adapt to new hazards. Only robots that respond quickly and efficiently will complete the mission with maximum points.

GENERAL
MISSIONS RULES

- Your robot must be launched from the **Start Zone** located on the mat. It should be fully prepared with the necessary coding and attachments for **all** the tasks your team plans to attempt.
- Teams must attempt the three missions in **the given order** .
  It's up to your team to plan and strategize the best way to perform each mission and maximize your score while following the required sequence.
- Each team will have two official matches. Use each match as a chance to improve your strategy and performance. **Only your highest score will count toward rankings and awards.**
- Team members and coaches must not touch or move their **robot or any game element** on the mat during a match. Violating this rule will result in a loss of points as outlined in the rubric.
  Hands-on interaction is permitted **only** within the designated home areas.
- You are not allowed to manually move your robot from one home area to the other, if you need to change the home area, program your robot to do so.
- Along with your robot's performance, teamwork, communication, and positive conduct matter. Judges and referees will observe how well your team works together, supports each other, and treats others with respect throughout the event.

GAME ZONES


Home Area 1 - Start Zone
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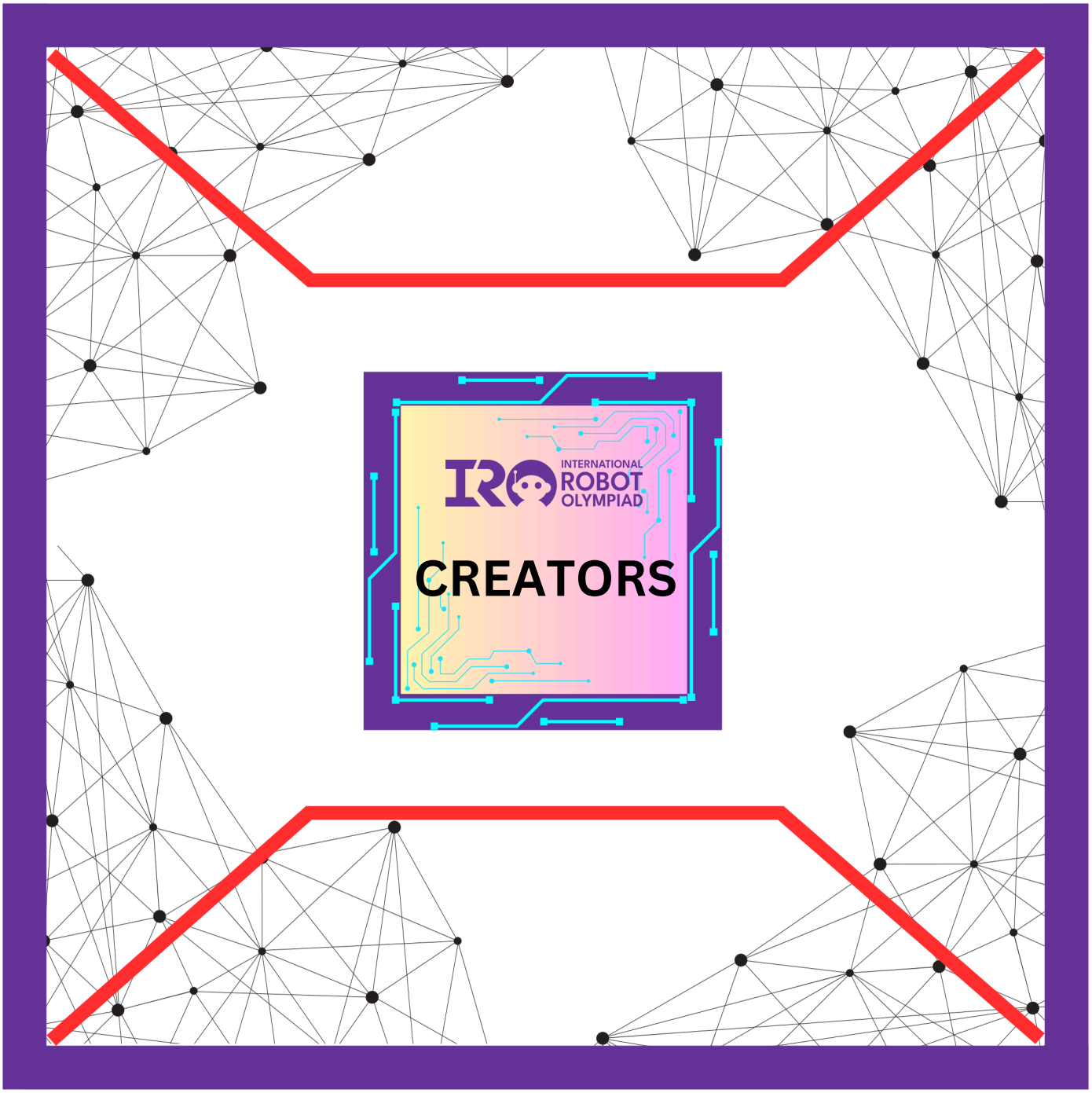
CREATORS
Home Area 2 - Parking Zone
Obstacles

MAT DESIGN



MISSIONS DETAILS

01 BUILDING THE AI GUARDIAN

Starting position:
Start Zone

Ending position:
Parking Zone

Mission Description:

- Your robot must navigate across the mat, avoiding all obstacles in its path. As it moves, the robot should pass through the designated checkpoints to show that the area has been patrolled and secured. Efficiency, accuracy, and obstacle avoidance are the keys to success.
- This mission demonstrates your robot's ability to operate safely and intelligently in a real-world-like environment.

Example:

- If the robot passes through the North Zone checkpoint, it must pause and align within the marked area to score points.
- If the robot touches a wall or obstacle while patrolling, points are deducted.

Scoring:

- Reaching and pausing at each Checkpoint Zone (10 points each)
- Completing the full patrol loop (30 points)

Penalty:

- Obstacles hit: -5 points each
- Skipping a checkpoint: -10 points

MAXIMUM SCORE FOR THIS CHALLENGE IS 80 POINTS.

MISSIONS DETAILS

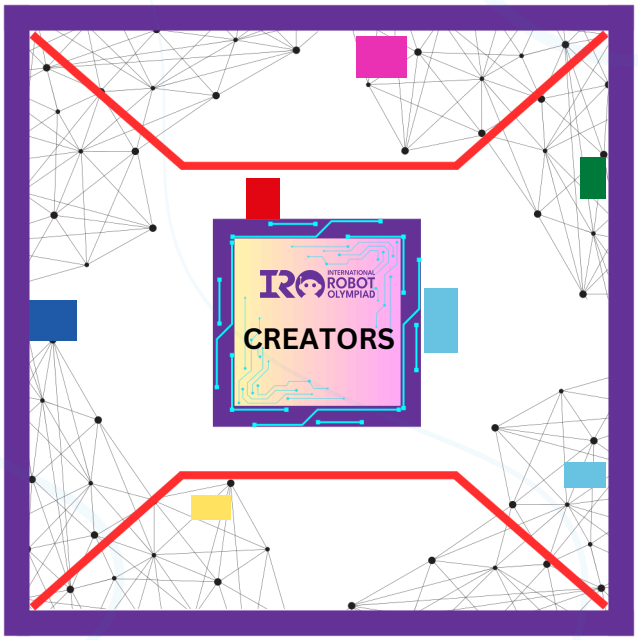
02 PATROL THE CITY

Starting position:
Start Zone

Ending position:
Parking Zone

Mission Description:

- Make a one full loop of following the line to go around the city and make sure every place is safe.
- It's up to your team to decide whether to use sensors or distances while following the line. However, if you are using distances instead of sensors, your robot must avoid all these obstacles.



Scoring:

- Successfully cross obstacle (10 points at each obstacle)

MAXIMUM SCORE FOR THIS CHALLENGE IS 70 POINTS.

MISSIONS DETAILS

CREATORS CHALLENGE

Starting position:
From anywhere on the mat

Ending position:
Parking Zone

Emergency Response:

- Unexpected obstacles can appear at any moment! In this mission, your robot represents an AI system that must regularly check for hazards to ensure safe operation.

Challenge Description:

  - To simulate emergency responses, your robot must visit the Safety Check Zone once during each full minute of activity. This shows the robot's ability to monitor its environment and adapt quickly.

Example:

  - Between 0:00 and 1:00 → one Safety Check must occur.
  - Between 1:01 and 2:00 → another Safety Check must occur.
  - And so on…
- Your robot may continue navigating or avoiding obstacles before or after the Safety Check, but it's your responsibility to track the timing and keep your system "safe."

Important Notes:

- If your robot starts or ends a patrol in the Parking Zone and performs the required action, it counts as the check for that minute.

Penalty:

- Failure to perform a Safety Check within a one-minute window = –5 points.

MAXIMUM PENALTY FOR THIS CHALLENGE IS - 20 POINTS.

GLOBAL
POINTS OR PENALTIES

TIME BONUS

Time Bonus: Your team will earn bonus points based on how quickly you finish **all missions.** The faster you finish, the more points you earn!

Timer when team declares “Finished”	Total Bonus Points
Completed between 3 mins and 4 mins	0
Completed between 2 mins and 3 mins	10
Completed in under 2 mins	20

Only the teams who will attempt **all missions** will be eligible for Time Bonus

MANUAL ADJUSTMENTS

Every time a team member touches the robot or it is taken outside the home areas, points will be deducted from their total score.

Number of illegal manual adjustments	Total deduction
0	0
Once	- 5
Twice	-10
More than twice	Disqualification

GETTING STARTED

Start with:

- Placing the Mat on a flat surface.
- Building the blocks and tokens and setting up the game mat properly before starting.

Read the Challenge Overview carefully.

- To learn how to maximize your score

Review the Rules Section to understand:

- How a match is started and finished.
- What your robot is allowed and not allowed to do.
- How scoring works for each mission.

Then,

- Build a basic robot using one of the allowed kits.

You are free to customize your robot by adding sensors, grabbers, and attachments based on the missions you want to complete.

- **No specific building instructions are provided –** this is your chance to be creative and innovative with your robot design.

Note:

- The competition table has boarders from all sides.
  - Table size: 3000x3000 mm
  - Mat size: 3000x3000 mm

EXAMPLE SCENARIO FOR ROBOT GAME

Step one: Judges will inspect the robot to make sure it is following the allowed specs

Step two: After the team has passed inspection, they will be given a couple of minutes to set up.

Step three: The team should inform the Judge that they are ready and wait for their approval to start.

After launching:

- Team members may not touch any game model or the robot outside the start zone to avoid losing points and/or get disqualified.
- Between mission, the robot must return back to one of the home areas only then the team members can switch the programs and adjust the robot direction if needed.
- The time taken to set up and start new code between missions is included in the total match time (4 minutes). Referees will not pause the timer during this process.

After 4 Minutes:

- After 4 minutes, the match ends. Technicians must stop their robot and touch nothing else. This is when scoring begins.
- For scoring, all mission requirements must be visible at the end of the match or as otherwise mentioned in the mission details.

👭 2. Team Motivation

TEAM MOTIVATION & VALUES

As Creators, your success isn't just measured by completing missions, but by how you design solutions, think critically, and grow together as a team.

Your team is encouraged to:

🧠 Collaborate like future innovators – combine your unique skills and perspectives to tackle complex problems and build something remarkable, together.

💡 Embrace bold thinking – whether you're engineering your robot, crafting your code, or responding to unexpected challenges, let your creativity lead the way.

🤝 Foster respect and inclusion – ensure every team member's voice is heard and ideas are considered, not just within your group, but throughout the competition environment.

🚀 Make the most of the journey – celebrate breakthroughs, learn from setbacks, and take pride in shaping the future as tomorrow's leaders in AI and robotics.

CHEERLEADING RULES:

Teams have the optional opportunity to bring one cheerleading group of **maximum 2–3 students**.
These students can be either members of the competing team or different students.
A **special award** will be given to the most enthusiastic and creative cheer team, so get your motivators ready and bring the energy!

💡 3. AI Invention Proposal

TEAM AI INVENTION PROPOSAL

As the future creators and problem-solvers of the world, your team is invited to design a concept for a brand-new AI-powered invention. Think big! Your invention could improve how we learn, protect the environment, enhance safety, or solve any real-world challenge that matters to you.

You should:

1. **Research & Brainstorm**
2. **Identify a problem** you'd like to solve using AI. What kind of invention could make life better for people, communities, or the planet?
3. **Develop Your Idea**
4. **Choose your best concept.** Research similar technologies or solutions. What makes your idea unique or innovative? What technologies might it use?
5. **Prepare to Present**
6. Think about **how you will clearly explain your idea** to the judges during your team presentation. You can use:
   - Diagrams or drawings
   - A short video or digital slide deck
   - A physical or digital prototype (optional)

It is up to your team to decide how will you showcase your idea.

🎤 4. Team Presentation

TEAM PRESENTATION

Your team will have 5 minutes to present their work to the Judges.

In this presentation you should:

- Tell the judges about your proposed invention and why it is important!
- Explain your robot design, code, and strategy
- Share your team's process

It's up to your team to decide how you want to present your work. You may use posters, slides, prototypes, or any other creative method – these are optional, not mandatory.

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