

IROBEX

Battle bot

2024



RULES & GUILDELINES

IROBEX Battle bot

Rules & guidelines

V.1.2

Contents

Overview	4
Section 1: Eligibility and Registration.....	6
Section 2: Robot Specification	8
2.1 Mobility and Control	8
2.2 Weapons and Configuration.....	8
2.3 Size, Weight and Height Limits	8
2.4 Component Protection and Safety	8
2.5 Activation/Deactivation.....	9
2.6 Electrical System.....	9
2.7 Remote Control System	9
2.8 Construction Materials.....	9
2.9 Prohibited Weapons.....	9
2.10 Special Considerations for Non-Wheeled Robots.....	10
Section 3: Judging Criteria and Evaluation Protocols.....	11
3.1 Determining Match Winner	11
3.2 Judging Criteria Overview	11
3.3 Judging Process	12
3.4 Finality of Decisions	12
Section 4: Combat Structure.....	13
Tournament Flow	14

Overview

Welcome to the IROBEX 2024 Tournament, an exciting platform where engineering and strategy meet in the dynamic arena of robotic combat. This document serves as the official compilation of rules and guidelines for all teams looking to participate. Our goal is to foster innovation and competitiveness while ensuring fairness, safety, and compliance with the competition standards.

Purpose

This document outlines the necessary regulations that govern the construction and operation of combat robots in the tournament. It is designed to ensure that all entries not only meet the technical and safety standards but also adhere to the spirit of fair competition.

Scope

The competition is open to teams from educational institutions. Each robot must fit within the specified dimensions and weight classes and adhere to the defined technical specifications.

Detailed information on eligibility is available in Section 1.1 of this document.

Key Requirements

All teams must undergo a preliminary approval process by IROBEX officials to ensure they meet design, safety, and operational standards. Specifications include limits on size, weight, power sources, and weaponry. For detailed technical requirements, refer to Section 2.

Procedure for Approval

To enter the competition, teams must submit a google form containing details of their robot for approval before beginning to build. The approval process is crucial to ensure acceptance of all competition guidelines and to prevent delays or disqualifications on the day of the event. For detailed information, refer to Section 1.2

Guidance and Support

If you have questions about your robot's design or need clarification on the competition rules, please contact our support team at [info@irobex.com]. We are here to assist you in ensuring your design meets all the necessary criteria.

Updates and Amendments

Please note that the rules and guidelines may be updated periodically to reflect changes in safety standards or competitive structures. It is the responsibility of each team to stay informed of any amendments. Updates will be communicated through our official email and direct emails to registered participants.

Consequences of Non-Compliance

Failure to comply with any of the rules set forth in this document can result in penalties ranging from scoring deductions to disqualification, depending on the severity of the infraction. Ensuring adherence to these guidelines is essential for fair and successful competition.

Invitation to Participate

We encourage all aspiring robot builders and designers to bring their creativity and technical skills to the forefront. Let this competition be a platform for innovation, showcasing your capabilities and potentially setting new standards in the field of robotic combat.

We look forward to seeing the ingenuity and engineering excellence that participants will bring to the IROBEX 2024 Tournament. Good luck, and may the best robots prevail!

Section 1: Eligibility and Registration

1.1 Eligibility Criteria:

IROBEX is committed to fostering an inclusive environment where creativity and engineering skill are the only requirements. The competition is open to all, the only requirement is that each team must consist of a minimum of Three members to ensure sufficient support and handling of the robot during the competition. This requirement is in place to ensure that all safety and operational protocols are observed during the event.

1.2 Registration Requirements:

To participate in the IROBEX competition, teams must provide detailed information about their robot and team members as part of the registration process. The required information helps in organizing the competition smoothly and ensures compliance with our technical and safety standards. Each team must submit the following information:

- **Robot Name** - Each robot must have a unique name. This name will be used for identification, scoring, and announcements throughout the competition.
- **Weight of the Robot** - Provide the weight of your robot in grams. This is crucial for classifying your robot in the appropriate weight category and ensuring compliance with the competition rules.
- **Dimensions of the Robot:** Report the length, width, and height of your robot in centimeters. Accurate dimensions are necessary to verify that your robot fits within the size limitations specified for the competition.
- **Main Weapon Description:** Describe the primary weapon system of your robot. Include details such as the type of weapon, operational mechanics, and any safety features incorporated to protect against unintentional activation or harm.
- **Robot Description:** Provide a brief description of your robot. This should include an overview of its design, special features, and any innovative technologies used. This description helps the audience, and judges appreciate the engineering work behind your creation.
- **Member Count:** Each team must meet the minimum requirement of Three members and maximum five Members including the team leader.

- **Team Member Details:** For each team member, include their first name, last name, and age. Moreover, a WhatsApp number of an active team member is required to provide any updates if necessary. This information is used for registration, identity verification, and ensuring all participants are accounted for in case of emergencies.
- **Organization Name (Optional):** While team affiliation with a school, university, or organization is not required, providing this information is encouraged if applicable. It can add context to your team's background and is used in various communications and publications related to the event.

1.3 Registration Submission:

All registration details must be submitted through the google forms link provided by the IROBEX officials on or before September 30th, 2024. Early submissions are encouraged as they provide additional time for any necessary revisions or compliance checks. Ensure that all information is accurate and up to date to avoid delays in the registration process.

Section 2: Robot Specification

This section provides comprehensive guidelines and rules for designing and building combat robots for participation in the IROBEX 2024 Tournament. Compliance with these specifications is mandatory to ensure fairness, safety, and minimal arena damage.

2.1 Mobility and Control

- **Types of Mobility:** Robots can use various mobility forms (walkers, rollers, hoppers, etc.) if they move in a controlled manner without damaging the arena.
- **Bot Control:** Robots must have reliable remote-control overall functions. Autonomous functions are allowed if they can be overridden remotely at any time.

2.2 Weapons and Configuration

- **Weapon Requirements:** Each robot must be equipped with at least one independently powered weapon capable of significantly impacting an opponent's operation. Spares or modular weapons are recommended.
- **Configuration:** Robots must be a single unit and meet all outlined design requirements. Multiple smaller robots combined into one are not permitted.
- **Functional Requirement:** Entry into the arena without a functional weapon result in a forfeit.

2.3 Size, Weight and Height Limits

- **Maximum Dimensions and Weight:** Robots must not exceed dimensions of 45cm x 45cm (length and width) and a weight limit of 15kg. Additionally, the maximum height of the robot is 50cm.
- **Weight Verification:** Weight will be officially verified at the tournament on certified scales. Design your robot underweight to accommodate last-minute adjustments.

2.4 Component Protection and Safety

- **Protection Requirements:** Batteries and high-pressure tanks must be shielded against penetration from sharp objects.
- **Floor Clearance:** There are no specific requirements for under-bot clearance as the arena floor is flat except for two pit areas.

2.5 Activation/Deactivation

- **Safety Systems:** The robot must be equipped with a single switch, referred to as the "Master Kill Switch," which controls both mobility and weaponry functions. When this switch is turned on, the robot should initiate its operations within 2 minutes. Similarly, when toggled off, the robot must power down within 2 minutes. Prior to the first battle attempt, the Master Kill Switch will be checked once to ensure it functions correctly. After this initial check, the functionality of the Master Kill Switch will not be verified before each subsequent attempt. Failure to activate or deactivate the Master Kill Switch within the specified time frame may result in disqualification from the battle round at the discretion of the judges.

2.6 Electrical System

- **Voltage Limits:** Weapon and motion systems must not exceed 48 volts.

2.7 Remote Control System

- **Communication Standards:** Use commercially available Digital Spread Spectrum (DSS) systems to minimize interference. The system should ensure the bot and its weapons cease function if the controller is turned off or signal is lost.

2.8 Construction Materials

- **Permissible Materials:** Avoid materials that create hazards or mess in the arena (e.g., toxic metals, loose fibers like asbestos). Specific bans include radioactive materials and certain reactive metals except in battery components.

2.9 Prohibited Weapons

- **Bans:** Specific weapons and tactics are prohibited, including EMP generators, fouling devices, deliberate smoke generators, liquids, flammables or explosives, lights that obstruct vision, projectiles, and entanglement devices. Weapons that damage the arena or endanger spectators or judges are not allowed. Apart from the prohibited weapons listed, participants are free to utilize other types of weapons as they see fit within the scope of the competition.

2.10 Special Considerations for Non-Wheeled Robots

- **Weight Advantage for Walkers:** Robots that move without wheels, using articulated legs, may qualify for additional weight allowances. This is subject to IROBEX's discretion to encourage innovative designs.

Each team must ensure their robot fully complies with these specifications to participate in the tournament. Understanding and adhering to these guidelines will facilitate smooth and fair competition.

Section 3: Judging Criteria and Evaluation Protocols

In this segment, we outline the criteria and process used by judges to assess robots during battles, including how damage, aggression, control, and strategy contribute to determining the match winner. Additionally, the winner or loser may also be decided based on whether a robot falls into the pit area during the match.

3.1 Determining Match Winner

- **Fall into Pit Area:** If a robot falls into the pit area, the remaining robot in the arena immediately wins, and vice versa.
- **No Fall into Pit Area:** If neither robot falls into the pit area, the winner is decided based on their scores according to the criteria outlined below. These are the two conditions followed when choosing a winner.

3.2 Judging Criteria Overview

The judging criteria use four factors, each assigned a point value as follows:

- **Damage – 5 Points**
Robots score 5 points if they significantly reduce their opponent's effectiveness without harming themselves.
- **Aggression – 2 Points**
Robots earn 2 points for consistent and effective attacks on their opponent without self-inflicted damage.
- **Control – 2 Points**
Robots receive 2 points for effective weapon use, targeting opponent weaknesses, and minimizing self-damage.
- **Strategy – 2 Points**
Robots gain 1 point for demonstrating a strategic plan leveraging strengths against opponent weaknesses or defensively guarding against opponent strengths.

3.3 Judging Process

- Each judge evaluates robots based on the criteria and assigns points accordingly.
- If the robots do not fall into the pit and the scores of each robot are equal, a rematch will be given to the robots.
- Based on the rematch, the scores of both the robots will determine which robot wins and goes to the next round.

3.4 Finality of Decisions

- Judges' decisions are final and not subject to challenge or appeal from competitors.
- Once most judges agree on the winner, that decision stands.

Section 4: Combat Structure

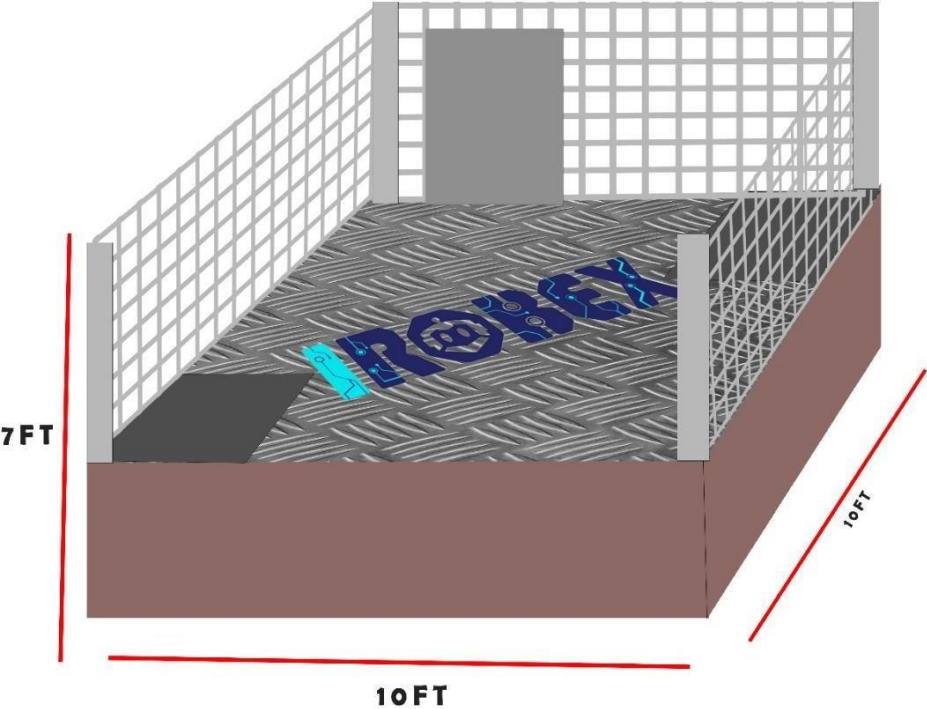


Figure 1: Battle cage displaying the 2 pits

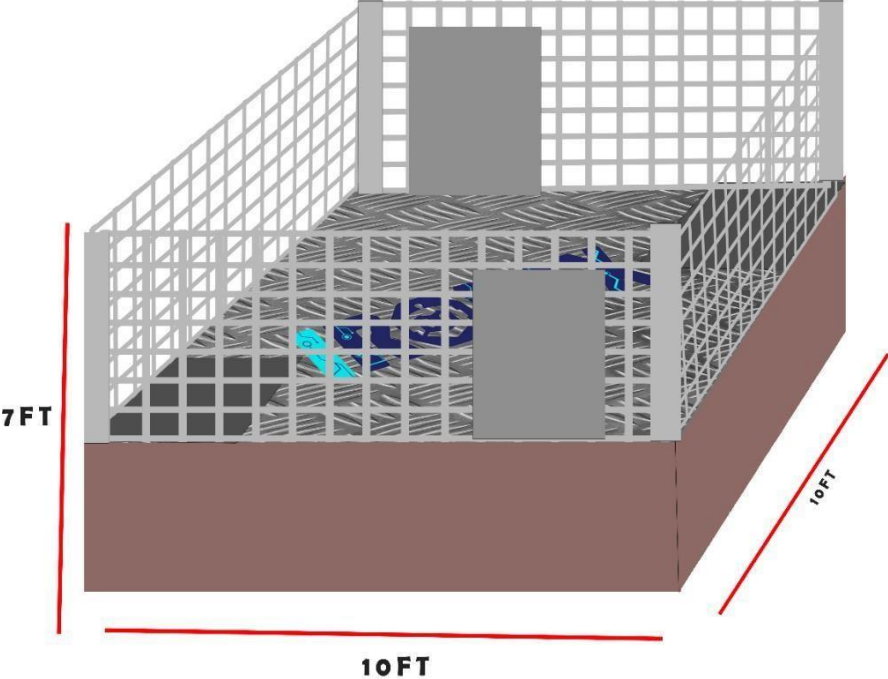


Figure 2: Battle cage view

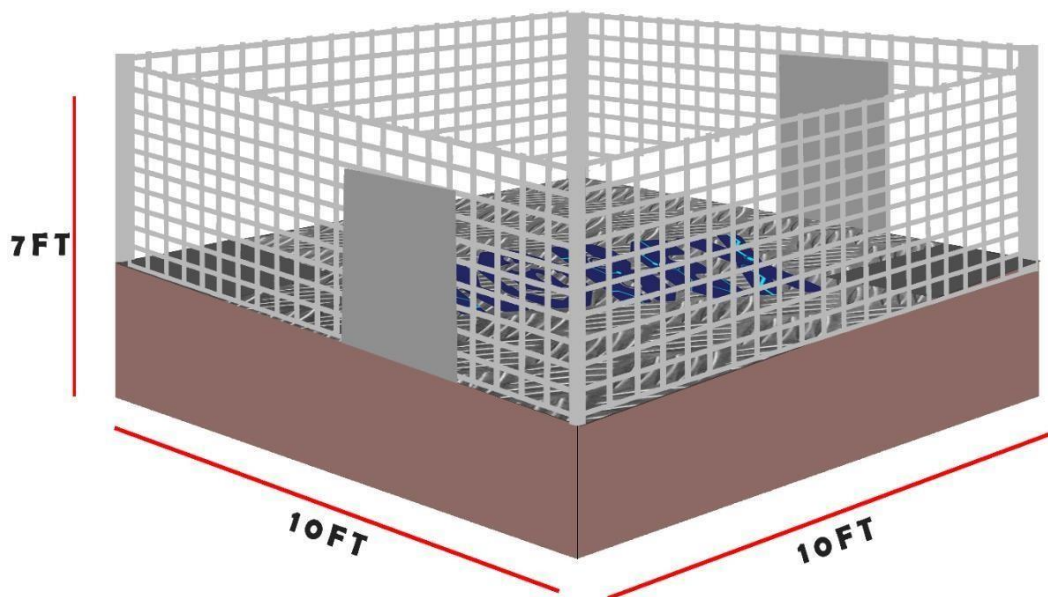


Figure 3: Battle cage view 2

This diagram above shows how the arena will be available on the day of the competition. The pits are visible in Figure 1.

Tournament Flow

We will notify the registered teams about the tournament rounds and the tournament flow via email using the contact information provided in the registration form.