

# Robotics Association of Nepal[RAN]

Talchikhel  
Lalitpur, Nepal

## Yantra International Robotics Competition 2024: Creating Robotics Industry of Nepal by 2030

### International Robotics Competition

### International League

### "Kicking into the Future: The Beautiful Game Meets Robotics"

### Yantra 9.0

### Theme Book:

### Introduction:

Hey everyone who loves soccer and tech! Welcome to Yantra 9.0: International League, the coolest event where soccer teams play against each other using robots. It's part of the Yantra International Robotics competition, and it's called "Kicking into the Future: Where Soccer Meets Robotics." It's not just a competition; it's a big party celebrating teamwork, cool inventions, and the awesome things that happen when soccer gets mixed with super cool robots. Yantra 9.0 is like the ultimate mix of the fun game we all love and the latest technology, promising a show that'll make you see soccer in a totally new way and make you want to try out tech stuff too! To fight against the Climate change, for every goal scored during the Yantra International League, the Yantra Organizing Committee will plant trees in Kathmandu valley.

### Yantra International League:

Teams of three robots and their Pilots are going to compete to score the most goals. The winning team not only gets to be super proud but also gets a chance to meet some famous Nepalese Football players. And here's a fun twist – for every goal scored, RAN is going to plant a tree in Kathmandu Valley to make the world a little greener!

## Theme Description:

"Kicking into the Future: The Beautiful Game Meets Robotics" isn't just a catchy phrase; it's what makes Yantra 9.0 so exciting. It's a big celebration of new ideas, a dance between technology and teamwork, and a little peek into a future where robots and soccer hang out together.

## Relevance and Significance:

In a world where technology is everywhere, Yantra 9.0 is showing how humans and machines can be friends. It's about trying new things, breaking the usual rules, and showing that the future where robots play soccer is already here – and it's awesome!

## Task:

Here's your job: Make 3 robots that can play soccer with other robots, and don't forget to add a cool shooting feature. It's like giving your robot superpowers for the game!

## Scoring Criteria:

- Goals only count when the ball crosses the goal line.
- The competition happens in stages, league games at first.
- From League games, top two teams from each group qualify for quarter finals
- Winning in the beginning gets you 3 points, losing gets you 0, and a draw means 1 point for each team.
- When it gets more serious in the later rounds (like quarterfinals), it turns into a knockout – one mistake, and you're out!

## Prizes and Recognition:

### Prizes:

- Winner: Rs. 1,00,000
- Runner up: Rs. 50,000.
- Certification and Medals for outstanding performance.
- Certificate of Participation: All participants receive digital certificates.

Note: Prize money is subjected to applicable government taxes.

## Certification Policy:

1. Winners get a certificate of appreciation, medals and trophy for being awesome.
2. All teams get a Digital certificate of participation.
3. Sponsors get a special certificate/recognition too. (This needs to be informed to the organizer 3 weeks prior the event)
4. If a team doesn't play fair, their certificates might get invalid/canceled – it's all about having fun and playing nice.

Get ready for Yantra 9.0 – where soccer meets the future, and robots take center stage!

## Rule Book:

### General Rules

1. **Voltage Limitation:** The potential difference between any two points within the robot or any external components must not exceed 24 volts.
2. **Team Composition:** Each team can consist of a maximum of 5 members.
3. **Age Group:** The age group is open to all.
4. **Robot Verification:** Robot verification will take place 2 weeks before the Competition. Teams are required to send videos and photos along with the Abstract of their robot building and design during the verification process.
5. **Safety Precautions:** Safety guidelines and precautions must be followed.
6. **Fair Play and Sportsmanship:** Unsportsmanlike behavior, including but not limited to cheating, disrespect, or harassment, will not be tolerated.
7. **Identity :** Bots and their pilots must be clearly identifiable throughout the event.
8. **Robot :** Participants are allowed to bring up to 5 robots that can be swapped twice in a match as substitution.
9. **Referee's Decision:** Decisions made by the event referees are final and binding.

## Robot Specifications

1. **Control:** Each robot must be manually wirelessly controlled.
2. **Dimensions:** The robot's size must not exceed 45 cm (length) \* 45 cm (width) \* 45 cm (height).
3. **Components:** The use of ready-made toy cars or Lego in robot construction is not permitted.
4. **Weight:** The robot's weight must not exceed 6 kg with a 5% tolerance.
5. **Shooting Mechanism:** A functional shooting mechanism is mandatory, otherwise the team will be disqualified.
6. **Keeper Robot Extension:** The Keeper robot is allowed to extend its structure and mechanism by an additional 15 cm during gameplay only.
7. **Drive Motor:** Motors like planetary motors, Brushless motor, Hybrid motor or any kind of modified stepper or high gear motor is not allowed.

## Game Play Rules

1. **Match Duration:** Each match is composed of two halves, with each half lasting 3 minutes, resulting in a total match duration of 6 minutes.
2. **Half-Time:** A brief 2-minute half-time break is provided between the two halves, allowing teams to make quick repairs to their robots if needed.
3. **Extra Time and Penalty Shootout:** Extra time and penalty shootouts come into play during the knockout phase, specifically in the quarter-finals onwards. Extra time lasts for 3 minutes, divided into two halves of 1.5 minutes each. If the match is still tied after extra time, a penalty shootout is conducted, and there are no goalkeepers in this shootout.
4. **Kick-Off:** Each half of the match begins with a kick-off from the center circle. The team that wins the coin toss at the start of the match gets to choose which goal to defend and starts the game.
5. **Goal Scoring:** A goal is scored when the entire ball crosses the goal line, passing between the goalposts and under the crossbar. The team with the most goals at the end of regulation time, extra time, or the penalty shootout wins the match.

6. **Out of Bounds:** If the ball goes out of bounds, the opposing team receives either a throw-in or a corner kick, depending on where the ball went out. The robot that last touched the ball before it went out cannot participate until the ball is back in play.
7. **Pushing Goalkeeper:** At any given time, Two bots can not push the goalkeeper.
8. **Fouls:** Traditional soccer fouls such as pushing ,tripping apply. The opposing team is awarded a free kick or penalty kick based on the location and severity of the foul.
9. **GoalKeeper:** Goalkeeper Robot can not cross the half line of their respective area.
10. **Robotic Interference:** If a robot from one team disrupts the movement or actions of a robot from the opposing team, leading to gameplay disruption, the opposing team is awarded a free kick or penalty kick at the discretion of the referee.
11. **Player Ejection:** In cases of repeated or severe fouls or unsportsmanlike behavior, a robot might get a Red Card., as determined by the referee.
12. **Referee's Decisions:** The decisions made by the referee are final and binding. Referees ensure that the rules are upheld and fair play is maintained throughout the match.

## Event Rules

1. **Ball Handling:** No dragging or picking of the ball is allowed. Robots must use their designated shooting mechanisms to interact with the ball during gameplay.
2. **Air Blowing Mechanism:** The use of air-blowing mechanisms to manipulate the ball is not allowed. Robots must rely on their shooting and kicking mechanisms to play the game.
3. **Ball Out of Arena:** If a robot throws the ball outside the arena, the opposing team will be awarded an advantage in the form of a throw-in or a corner kick, depending on where the ball left the field of play.
4. **Free Kick Distance:** In the case of a free kick, the robot taking the kick must maintain a minimum distance from the robot defending or attempting to block the kick. The specific distance will depend on the position from where the free kick is taken, as determined by the referee.
5. **Penalty Kick:** Penalty kicks, used as a means to penalize fouls committed within the D area (penalty area), will be taken from the middle of the ground. This rule ensures that

penalty kicks are fair and central, offering an equal opportunity for both the kicker and the goalkeeper.

6. **Penalty Shootout:** Each penalty shootout will have a time limit of 15 seconds for each robot. Robots will take turns attempting to score goals during the shootout.
7. **Yellow and Red Cards:** In the event of a foul, the offending team will receive a warning in the form of a yellow card. Repeated mistakes or severe violations may result in disqualification (red card) of the offending team.
8. **Physical Damage:** If a participating robot causes any kind of physical damage to the opponent's robot during a match, it will be immediately disqualified. Safety is a priority, and such actions are strictly prohibited.
9. **Strict Adherence to Schedule:** Teams must arrive on time for scheduled matches. A grace period of 5 minutes is provided for unforeseen delays. Failure to arrive within this period results in a warning for the first offense. Subsequent offenses will lead to a deduction of 3 points from the team's overall score.
10. **Disqualification for Persistent Violations:** Persistent violations of time management rules, including failure to notify the organizing committee of delays or deliberate manipulation of match timings, may result in immediate disqualification from the competition.
11. **Team Identification:** Teams should prominently display their team identification and robot numbers during matches to ensure clear identification by referees and spectators.

## Arena Specifications

1. **Arena Size:** The arena is an 20ft \* 16ft rectangle with a boundary wall, standing at a height of 20 cm.
2. **Markings:** All markings within the arena are consistent with those found on a standard football field.
3. **Ball Size:** The soccer ball used in the competition is approximately 10 cm in diameter.
4. **Goalkeeper Area:** A designated goalkeeper area, often referred to as the "D area" is marked within the arena. Pushing the goalkeeper is not allowed in the D area.
5. **Referee's Station:** A designated referee's station is set up adjacent to the playing arena.