Robotics Association of Nepal[RAN]

Talchikhel

Lalitpur, Nepal

Yantra International Robotics Competition 2025: Creating Robotics Industry of Nepal by 2030

Yantra President's Cup : Yantra Kids

"Transforming Tech Trash into Treasures"

Theme Introduction

The **Yantra Kids: Transforming Tech Trash intro Treasures** aims to inspire innovative use of robotics and AI to address the critical issue of e-waste management. In today's technology-driven world, discarded electronics contribute significantly to pollution and resource wastage. This competition challenges participants to design autonomous robots capable of navigating mazes, detecting e-waste using sensors, and transporting it to recycling zones. These tasks highlight the potential of robotics and AI to transform e-waste into valuable resources, making a meaningful impact on sustainability.

Beyond technical excellence, the theme fosters environmental awareness, teamwork, and critical thinking. Through problem-solving and programming, participants gain hands-on experience addressing real-world challenges. Robots become tools for positive transformation, illustrating how technology can promote a greener, smarter future.

Competition Overview

The **Yantra Kids:Transforming Tech Trash into Treasures** promotes creativity, sustainability, and teamwork.. Participants must design autonomous robots to complete tasks such as navigating a maze with ultrasonic sensors, following line paths, and detecting objects using IR sensors. The event emphasizes innovative problem-solving while addressing real-world issues like e-waste management.

Eligibility Criteria

- Participants must be school students from grades 4 to 10.
- Each team must have 4 members with an adult mentor.
- Robots must be built by the participants themselves before the event.

Registration Details:

Early Bird Registration: Nrs 3000
Normal Registration: Nrs 5000
Late Registration: Nrs 7000
Prize pool of NRs. 32000

** Some of the rules and regulations, and minor gameplay are subject to change as required in future **

Note: Prizes are subject to applicable government taxes

Yantra Kids Pre- Event:

The **Yantra Kids Pre-Event** aims to inspire young minds through hands-on exploration of **e-waste materials**—items often dismissed as junk. Students will creatively repurpose discarded electronics (broken keyboards, old phones, wires, batteries, etc.) to design **innovative, functional, or expressive creations**.

Objectives

- Engage students in **STEM learning through creativity** and **sustainability**.
- Encourage innovation using **e-waste as raw materials**.
- Provide a platform for **student voice** and **presentation**.
- Build **confidence** and **teamwork** ahead of the main robotics competition.

Judging & Presentation

All projects will be featured in a **student-led showcase**, where participants will:

- Explain their **design process**
- Share **what they learned**
- Highlight how their creation relates to the **themes of innovation, reuse, or robotics**

Judging Criteria

Criteria	Description	Points
1. Creativity & Originality	Unique concept, imaginative design, and innovative use of e-waste components.	15 points
2. Use of Materials	Effective, thoughtful, and safe reuse of e-waste; minimal use of new items.	10 points
3. Functionality or Message	Project either works as intended (mechanically/electronically) or communicates a clear idea.	10 points
4. Presentation & Explanation	Clear explanation of process, learnings, and relevance to innovation, reuse, or robotics.	15 points

Main Event :Yantra Kids Robotics Competition

Robot Requirements

- **Autonomy:** Robots must operate autonomously.
- **Sensors:**
  - Ultrasonic sensors for maze navigation.
  - IR sensors for object detection and line following.
- **Dimensions:** Maximum size of 30 cm × 30 cm × 30 cm.
- **Weight Limit:** Robots must weigh no more than 3 kg.
- **Power Source:** Battery-powered; combustible energy sources are prohibited.

Preparation Guidelines

- **Sensor Calibration:** Ensure ultrasonic and IR sensors are calibrated for accuracy.
- **Testing:** Conduct mock runs to refine navigation and object-handling capabilities.
- **Team Coordination:** Assign roles such as coding expert, hardware designer, and strategist for efficiency.

Gameplay Zones and Tasks

1. **Maze Detection Zone (Ultrasonic Sensors):** Robots start in a maze and use ultrasonic sensors to navigate walls and obstacles, finding the exit autonomously.
2. **Line Following Zone:** After the maze, robots follow clearly marked black lines on a white surface, navigating paths to the object detection area.
3. **Object Detection Zone (IR Sensors):** Robots use IR sensors to identify e-waste objects marked with reflective strips, push or transport them, and deliver them to a designated collection area.

Gameplay Regulations

- Robots must operate autonomously throughout the competition.
- Robot is touched during the time of start and after the completion.
- Tasks must be completed within the time limit.
- Objects must be fully delivered into the collection zone for scoring.

Time Limit: Each team will get a certain time limit to complete the tasks.

Scoring System

Task Component	Points	Criteria
Maze Navigation	40 Points	Smooth, collision-free navigation
Object Detection	30 Points	Accurate identification of marked objects
Object Handling	20 Points	Successful delivery into the collection zone
Time Efficiency	10 Bonus Points	Completing tasks within a set time limit

Penalties

- **Collision with Maze Walls:** -5 points per collision.
- **Boundary Violation:** -10 points if robots leave designated zones.
- **Failure to Deliver Objects:** No points for undelivered objects.

Education and Outreach

The competition includes optional workshops and demo sessions (additional charges apply) to teach participants sensor integration, programming, and the importance of e-waste management. This ensures both technical understanding and environmental awareness, making the event impactful for all.

Awards and Recognition

- **Winner(Best Performance Award):** For the highest overall score.
- **1st Runner up:** Team with the second highest overall score
- **Innovation Award:** Recognizing the most creative and efficient design.
- **Team Spirit Award:** For outstanding teamwork and collaboration.

Theme Takeaway

This competition merges robotics with environmental stewardship, inspiring participants to solve real-world challenges while highlighting the importance of sustainability in technology. The event aligns technical skills with meaningful goals, encouraging innovation and responsibility.

Contact Information

For inquiries, please reach out to:

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We look forward to welcoming you to the **Yantra Kids:Transforming Tech Trash into Treasures** and witnessing your innovative robots in action.

Best of luck to all participants as you contribute to building a smarter, greener future.