

# Line Following Bot

## Problem Statement

An autonomous robot has to follow black lines on a white background and reach from starting line to finishing line as soon as possible. Robot must be able to detect particular line and keep following it.

## Game play

Robots will be placed at starting point and time will be recorded until it reaches finish line.

Each team will be given two trials in each round.

A robot must restart if:

- The robot does not start after pressing the Start Button for 1 minute.
- A human touches the robot.
- The robot moves off the field.
- The referee orders to restart.

There is no limit for the number of restarts within the TRIAL period.

Time limits, scoring and penalties rules will be announced on the day of event.

# Line Following Bot

## Robot

- The following size limitations apply for each robot

Width – 200mm max

Length – 200mm max

Height – no limit

- The robot cannot have potential more than 12V between any two points.
- The robot must be controlled autonomously with no human aid.
- The robot must be started manually with a start button.
- The robot can be powered by a power source such as a battery fixed on the robot or by a stationary power source connected to the robot by a cord.
- Participants should keep spare batteries otherwise; it may lead to disqualification if bot is not ready or stops in trial.

# Line Following Bot

## Arena

- The arena is made up of white colored flex sheet with black colored lines on it.
- There will be one START point and one FINISH point in the entire arena.
- The thickness of the lines will be 30mm.
- The course line may have acute, obtuse and right angles, curves.
- The course line may also have discontinuities at various points.

## Rules & Regulations

- A team can have maximum of 3 members.
- Before each game begins, the participants should clearly describe how their robot detects the obstacles and indicates at the checkpoint.
- Between trials, participants may not feed information about the arena to the machine. However, participants are allowed to: Adjust sensors (Gain, Position etc.), Change speed settings and Make repairs. However, a participant may not alter a machine in a manner that alters its weight

# Line Following Bot

(e.g. removal of a bulky sensor array or switching to lighter batteries to get better speed). The judges shall arbitrate.

- One team member is elected as the robot handler. Only that team member is permitted to handle the robot during the game. All other team members must remain outside the game zone.
- Participants who misbehave may be asked to leave the competition area and risk being disqualified from the contest.
- Robots or participants that cause deliberate interference with other robots or damage to the arena will be disqualified.
- All decisions about scoring, game play and timing made by the Organizing Committee are final. Teams should completely respect their vote and decisions.

# RoboKick

## Problem Statement

A manually controlled robot wired or wireless has to push ball in opposite team's goal post and also it has to prevent opposite team from pushing ball in our goal post. Robots can have kicking mechanisms.

## Game play

- This is a 1 on 1 type game.
- The balls used will be 3 – inch smiley balls.
- Robots will be placed in different halves of the arena with ball in center of arena.
- Each team will try to score goal by pushing the ball.
- Team with more number of goals will win the match.
- If ball goes out of arena it will be placed in center and match will be resumed.
- In case of a tie, 3 penalties would be taken by each team.
- Match duration will be announced on the day of event.

# RoboKick

## Robot

- The following size limitations apply for each robot including whatever kick mechanisms the bot have
  - Width – 250mm max
  - Length – 250mm max
  - Height – 250mm max
- The robot cannot have potential more than 12V between any two points.
- The external device, which is used to control the machine, is not included in the size constraint.
- The machine can be wired/wireless.
- The machine must not be made from Lego parts, or any ready-made assembly kits, however participants are allowed to use their own creativity for the kick mechanism.
- The robot can be powered by a power source such as a battery fixed on the robot or by a stationary power source connected to the robot by a cord.
- Participants should keep spare batteries otherwise; it may lead to disqualification if bot is not ready or stops in between the match.
- The length of the wire (for wired bots) should be long enough to cover the whole arena and wire should remain slack during the complete game.

# RoboKick

## Arena

- The arena is made up of wooden ply of dimensions 8 feet in length and feet in 4 widths.
- The arena has 15 cm wide goal post on either sides.
- The arena is bounded from all sides.

## Rules & Regulations

- A team can have maximum of 3 members.
- One team member is elected as the robot handler. Only that team member is permitted to control the robot during the game. All other team members must remain outside the game zone.
- Participants who misbehave may be asked to leave the competition area and risk being disqualified from the contest.
- Robots or participants that cause deliberate interference with other robots or damage to the arena will be disqualified.
- All decisions about scoring, game play and timing, participation made by the Organizing Committee are final. Teams should completely respect their vote and decisions.

# RoboRace

## Problem Statement

A manually controlled robot wired or wireless has to traverse through the track full of turns and obstacles in minimum possible time.

## Game play

- The robot will be placed at start line.
- The robot can start the lap when timer starts.
- The robot should remain on track, otherwise it has to start from last checkpoint crossed though timer will not be stopped.
- There are penalties for each obstacle skipped. Penalties will be added to total time.
- Timer will stop as soon as robot crosses finish line.
- Scoring and penalties rules will be announced on the day of event.

# RoboRace

## Robot

- The following size limitations apply for each robot
  - Width – 250mm max
  - Length – 250mm max
  - Height – 250mm max
- The external device, which is used to control the machine, is not included in the size constraint.
- The machine can be wired/wireless.
- The machine must not be made from Lego parts, or any ready-made assembly kits, and it must be powered electrically, use of IC engine is not allowed.
- The robot can be powered by a power source such as a battery fixed on the robot or by a stationary power source connected to the robot by a cord.
- Potential between any two points on the robot should not exceed 12 V.
- Participants should keep spare batteries otherwise; it may lead to disqualification if bot is not ready or stops in between the race.
- The length of the wire (for wired bots) should be long enough to cover the whole arena and wire should remain slack during the complete race.

# RoboRace

## Race Track

- There will be only one Start and one Finish line.
- The track surface and course line may have unevenness.
- There will be certain obstacles in the racetrack, which will try to slow down the robot.
- The design and size of the track may vary from that shown in the pictures.
- Track may consist of bridges, speed breakers, marble pit, slippery path, rotating disc, curve ramp down, seesaw etc.

## Rules & Regulations

- A team can have maximum of 3 members.
- One team member is elected as the robot handler. Only that team member is permitted to control the robot during the game. All other team members must remain outside the game zone.
- Participants who misbehave may be asked to leave the competition area and risk being disqualified from the contest.

# RoboRace

- Robots or participants that cause deliberate interference with other robots or damage to the arena will be disqualified.
- All decisions about scoring, game play and timing, participation made by the Organizing Committee are final. Teams should completely respect their vote and decisions.

# RoboKombat

## Problem Statement

Two manually controlled robot wired or wireless are placed in arena. The robots have to fight one-on-one battle with other robot in arena using the weapons.

## Game play

- The robot and opponent's robot will be placed in arena.
- The robots will fight and try to score points according to the scoring rules.
- There will be points for pinning, damaging, tackling and toppling the other robot.
- In case of tie, there will be a tiebreaker, which will be decided by organizers.
- The winner will be decided by more points, or if the other robot is immobile. Robot will be declared immobile if it cannot show linear motion of 5 inch in 30 seconds.

# RoboKombat

- If robots become entangled or a crushing or gripping weapon is employed and becomes trapped within another robot, then the competitors should make the timekeeper aware, the fight should be stopped and the robots separated by the safest means.
- Final Time limits, Scoring and penalties rules will be announced on the day of event.

## Robot

- The following size limitations apply for each robot
  - Width – 600mm max
  - Length – 600mm max
  - Height – 600mm max
  - Weight – 35Kg Max
- The external device, which is used to control the machine, is not included in the size constraint.
- The machine can be wired/wireless.

# RoboKombat

- The robot cannot have potential more than 24V between any two points.
- The machine must not be made from Lego parts, or any ready-made assembly kits, and it must be powered electrically.
- Nothing can intentionally detach from the robot. Robots will not be immediately penalized if pieces detach because of breakage. In the case of repeated breakage, the Referee may invalidate a Battle, request certain remedies be taken, or disqualify a Team. Robots can have any kind of cutters, flippers, saws, hammers, and lifting devices etc. as weapons.

## **The following weaponry is not allowed:**

- Liquid projectiles, Acid based Weapons, EMP generators, any kind of flammable liquid, Flame-producing weapons, any kind of explosive material, Radio jammers, any other weapon that might cause damage to the arena, Pneumatics and Hydraulics
- The robot must not contain any combustible, corrosive, or other materials which may pose a hazard to any person, robot or object. Participants should keep spare batteries otherwise it may lead to disqualification if bot is not ready or stops in between the event.
- The length of the wire (for wired bots) should be long enough to cover the whole arena and wire should remain slack during the complete battle round.

# RoboKombat

- All wires should be channeled together at the top of robot to avoid tangling and damage to wires.

## Arena

- Arena is made by 12 feet x 12 feet platform at 2 feet height from ground level.
- Arena's platform will be covered by metal sheet.
- Platform will be surrounded by wire meshes with polycarbonate sheets for protection.
- There will be appropriate space for wired bots to place wires.

## Safety

- Compliance with all event rules is mandatory. It is expected that competitors stay within the rules and procedures of their own accord and do not require constant policing. The machine would be checked for its safety before the competition and the team would be disqualified if their machine were found unsafe.
- Participants are requested to wear shoes and helmet during a match.

# RoboKombat

- Participants are expected to abide by the rules & should cooperate with the organizers.
- If you have a robot or weapon design that does not fit within the categories set forth in these rules or is in some way ambiguous or borderline, please contact the event organizers. Safe innovation is always encouraged, but surprising the event staff with your brilliant exploitation of a loophole may cause your robot to be disqualified before it even competes.
- All participants build and operate robots at their own risk. Combat robotics is inherently dangerous. There is no amount of regulation that can encompass all the dangers involved. Please take care to not hurt yourself or others when building, testing and competing.
- Proper activation and deactivation of robots is critical. Robots must only be activated in the arena, testing areas, or with the express consent of the event organizers.
- Kindly note that we are very strict about compliance with the above mentioned Safety measures. Any violations will lead to immediate disqualification.

# RoboKombat

## Rules & Regulations

- A team can have maximum of 5 members.
- Three team members are elected as the robot handlers. Only that team members are permitted to control the robot during the game. All other team members must remain outside the game zone.
- Participants who misbehave may be asked to leave the competition area and risk being disqualified from the contest.
- Robots or participants that cause deliberate interference with other robots or damage to the arena will be disqualified.
- All decisions about scoring, game play and timing, participation made by the Organizing Committee are final. Teams should completely respect their vote and decisions.

# RoboSumo

## Problem Statement

A manually controlled robot wired or wireless has to either push other robot out of arena or make it immobile. Robots can have pushing, toppling and braking mechanisms.

## Game play

- This is a 1 on 1 type game.
- The robot and opponent's robot will be placed in arena.
- The robots will fight and try to push other robot out of arena or make it immobile by toppling.
- Robot will be considered out of arena if it touches the ground or its 75% or more body is out of the boundary.
- Robot will be declared immobile if it cannot show linear motion.
- In case of tie, there will be a tiebreaker, which will be decided by organizers.
- If robots become entangled or trapped within another robot, then the competitors should make the timekeeper aware, the fight should be stopped and the robots separated by the safest means.
- Final Time limits, Scoring and penalties rules will be announced on the day of event.

# RoboSumo

## Robot

- The following size limitations apply for each robot including whatever pushing and breaking mechanisms the bot have
  - Width – 300mm max
  - Length – 300mm max
  - Weight – 15 kg max
- The robot cannot have potential more than 12V between any two points.
- The external device, which is used to control the machine, is not included in the size constraint.
- The machine can be wired/wireless.
- The machine must not be made from Lego parts, or any ready-made assembly kits, however participants are allowed to use their own creativity for the pushing, breaking and toppling mechanism.
- Nothing can intentionally detach from the robot. Robots will not be immediately penalized if pieces detach because of breakage. In the case of repeated breakage, the organizing committee may invalidate a Battle, request certain remedies be taken, or disqualify a Team.
- Robots can have any pushing, breaking, flipping, lifting devices etc. as weapons.

# RoboSumo

## The following weaponry is not allowed:

- Liquid projectiles, Acid based Weapons, EMP generators, any kind of flammable liquid, Flame-producing weapons, any kind of explosive material, Radio jammers, any other weapon that might cause damage to the arena, Pneumatics and Hydraulics
- The robot is not allowed use any kind adhesive or mechanism, which can stick to the platform.
- The robot must not contain any combustible, corrosive, or other materials, which may pose a hazard to any person, robot or object.
- The robot can be powered by a power source such as a battery fixed on the robot or by a stationary power source connected to the robot by a cord.
- Participants should keep spare batteries otherwise; it may lead to disqualification if bot is not ready or stops in between the match.
- The length of the wire (for wired bots) should be long enough to cover the whole arena and wire should remain slack during the complete game.

# RoboSumo

## Arena

Arena is a circular platform at some height from ground.

## Rules & Regulations

- A team can have maximum of 4 members.
- One team member is elected as the robot handler. Only that team member is permitted to control the robot during the game. All other team members must remain outside the game zone.
- Participants who misbehave may be asked to leave the competition area and risk being disqualified from the contest.
- Robots or participants that cause deliberate interference with other robots or damage to the arena will be disqualified.
- All decisions about scoring, game play and timing, participation made by the Organizing Committee are final. Teams should completely respect their vote and decisions.