भारतीय सूचना प्रौद्योगिकी संस्थान, नागपुर

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FIESTA

Presents

Fighter Bot

(Robo Hunger)

Category – fighting bots

All participants are advised to carefully go through this information brochure and should follow each and every instructions mentioned here.

Aim – to design a fighter robot which is controlled by wireless remote control device.

BOT specifications-

•1) Robot must be waterproof.

•It should be able to traverse on rough terrain.

•It should be able to pass through a gap of 800mm width.

•Flying (using airfoil, helium balloons, ornithopters, etc.) is not allowed.

Robots should not secure itself on the ring surface by using suction cups, diaphragms, sticky treads, glue or other such devices.

•maximum weight of bot must be 50kgs and minimum weight should be 28kgs including on board batteries and pneumatic tanks. Only weight of remote control will not be counted.

The machine should not intentionally be split into components or any parts should not be intentionally detached from machine at any point of match.

•Autonomus bots with manual override feature and emergency stop are allowed, however these features must be on remote controller as well.

MOBILITY- 1) Rolling (wheels, tracks or the whole robot).
2)Walking (linear actuated legs with no rolling or cam operated motion).
3)Shuffling (rotational cam operated legs)
4)Jumping and hopping is allowed, but max height while jumping of any part of machine should not be more than 4 feet.
4)Flying (using aerofoil, helium balloons, ornithopters, etc.) is not allowed.

battery specifications

•all power source must be on board only.

•Robots must be powered electrically only. Use of IC engine in any form is prohibited.

•Onboard batteries must be sealed and must be well protected ,so that it may not burst or catch fire, violation of this rule may lead to disqualification of team.

•Batteries permitted are Ni-Cd, NiMH, Li, gel ,dry cells only.

•Use of damaged and non leak proof batteries may lead to disqualification.

•All effort must be taken to protect the battery from short circuit causing fire.

•Change of batteries is not allowed till time out.

8)The voltage difference between any two points in the machine should not be more than 40V DC at any point of time.
9) each bot must have failsafes

a) manual emergency-stop on bot as well as on remote controller to stop bot without harming anyone. And damage caused by this will be the responsibility of the team.

Remote controller

•In case of wireless operation each robot must have two remote control (or a dual frequency Remote control circuit) which can be switched to either frequency before the start of the race. This is done to avoid frequency interference between the two competing robots in the game.

- **remote controller must have transmission range of at least 10 meters.**

•Remote control system from toys can also be used and also those available from the market.

•Teams must pair their wireless with their bots prior to the match, no extra time will be given for that.

•Remote control must be capable of manually overriding and shutting down bot in case of emergency. this feature is compulsory.

hydraulics

•Robot can use non-inflammable liquid to actuate hydraulic devices e.g. cylinders.
•All hydraulic components on-board must be securely mounted. Special care must be taken while mounting pump, accumulator and armour to ensure that if ruptured direct fluid streams will not escape the robot.
•All hydraulic liquids are required to be non-corrosive and your device should be leak proof.
•Maximum allowed pressure is 12 bars*.

- **Participant must be able to indicate the used pressure with integrated or temporarily fitted pressure gauge.**
- **Entire hydraulic setup should be on board, no external input (from outside the arena) can be given to the robot for functioning of its hydraulic system.**

Pneumatics

Robot can use pressurized non-inflammable gases to actuate pneumatic devices. Maximum allowed outlet nozzle pressure is 10 bar. The storage tank and pressure regulators used by teams need to be certified and teams using pneumatics are required to produce the Safety and Security letters at the Registration Desk at the venue. Failing to do so will lead to direct disqualification.
Participants must be able to indicate the used pressure with integrated or temporarily fitted pressure gauge. Also there should be provision to check the cylinder pressure on the bot.
The maximum pressure in cylinder should not exceed the rated pressure at any point of time.
You must have a safe way of refilling the system and determining the on board pressure.
All pneumatic components on board a robot must be securely mounted. Care must be taken while mounting the pressure vessel and armor to ensure that if ruptured it will not escape the robot. The terms 'pressure vessel, bottle, and source tank' are used interchangeably.
Entire pneumatic setup should be on board, no external input (from outside the arena) can be given to the robot for functioning of its pneumatic system.

Weapons

Robots can have any kind of magnetic weapons, cutters, flippers, saws, lifting devices, spinning hammers etc. (if they qualify the criteria mentioned below) as weapons.

Following weapons are exceptions and <u>cannot be used</u>:

1) Liquid projectiles (Foam, liquefied gases)

2) Any kind of inflammable liquid.

3) Flame-based weapons (Even flammable solids)

Weapons causing invisible damage (Electrical weapons, RF jamming weapons and others)

Spinning Weapons:

- **The maximum rotational speed of any point on the weapon/body should not exceed 150mph*.**
- **Spinning weapons must come to a full stop within 60 seconds of the power being removed using a self-contained braking system.**

Spring-loaded or flywheels:

- **Under no circumstances must a large spring be loaded when the robot is out of the arena or testing area.**
- **All springs, flywheels, and similar kinetic energy storing devices must**

fail to a safe position on loss of radio contact or power.

Inception and basic format of robo hunger games

Robo hunger games is not any traditional robowar or any sort of common college fest event,it is one of its kind and completely different from the conventional robo wars, it is the ultimate survival test of robots. Inspired from the famous novel "the hunger games". The thing that makes this event unique is its arena and its battle framework, it tests the ability of robot to survive against the hostile arena plus challenge from other opponents. The arena is designed in such a way that only one robo can survive and rest all are eliminated.
BASIC FORMAT-Each of the fighters will be given one sector of the arena ,they have to overcome its difficulties plus the challenge from other bot. it is not mandatory for fighting bots to cover entire arena ,but they have to destroy others and if they stay in their own sectors other bots will come and destroy them. Your aim should be to destroy others and survive the hostile arena and the last bot standing will be the winner.

Team specifications

Each team can have max 6 members. Members can be from different institutions. There should be one captain of team with whom all communication will take place.
Each team must have a unique name and must be given at the time of registration.
Registration fees per team is INR 1000/- and for other countries it is 100 USD.

Competition rules and guidelines

Read all of these very carefully

1) There will be water barriers on the track. Hence, make sure your robot is water-proof.

2) the terrain is tough and uneven so design robots according to it.

3) Each of the fighters will be given one sector of the arena , they have to overcome its difficulties plus the challenge from other bot. it is not mandatory for fighting bots to cover entire arena ,but they have to destroy others and if they stay in their own sectors other bots will come and destroy them. Your aim should be to destroy others and survive the hostile arena and the last bot standing will be the winner.

4) It is mandatory for fighters to destroy other opponents by moving into their area, or destroy them in the central arena by dragging them there. It is mandatory for a robot to fight with other bots within 5 minutes of commencement of the game. Violation of this rule will lead to disqualification.

5) Time given for fighter round will be 25 min.

6)Although the arena is designed such that only one survives after the round ,but if we have more than one survivors then winner will be decided by the following rules.

1) All the surviving bots will be given a 30 min break during which they can be recharged and only damaged parts will be replaced with identical one.

Note- no alterations to software, addition of weapons and any other changes to bots can be made during the break .violation of this policy will lead to direct disqualification.

2) after the break all the surviving bots will have to battle at the same time in the central arena where they will have to fight against each other and winner among them will be the victor of the tournament. Time for this battle will be 5mins.

(pls refer fighting rules at central arena).

7)It is to be noted that if any participant takes advantages of some loophole in the rules and surprises the judges, it will lead to immediate disqualification of the team.

8) **Teams that are not ready when called for battle will be considered to have declared a walkover, and will disqualified.**

9) It is mandatory for every team to sign a declaration mentioning your robot is safe and accident caused by it will be responsibility of the team.
10) robots should not damage the arena.
11) once in arena if a robot's battery is discharged or it is immobile due to assault ,it will be eliminated.
12) organizers will not be responsible for damage caused to bots due to traps and terrains of the arena.
13)every team must cooperate with organisers ,volunteers and must abide by their instructions and directions.
14) improper behaviour will not be tolerated and team can be disqualified. Organizing team of hunger games reserves all rights to disqualify a team.

criteria for victory

- **A bot is eliminated if it is immobile.**
- **A robot will be declared immobile if it cannot display linear motion of at least one inch in a timed period of 30 seconds. A bot with one side of its drivetrain disabled will not be counted out if it can demonstrate some degree of controlled movement. In case both the robots remain mobile after the end of the round then the winner will be decided subjectively.**
- **A bot who survives the terrain and eliminates other opponents by immobilising them ,and remains the only survivor will be the victor.**

- **If more than one bots survive then winner will be decided by central arena rules.**

- **There shall be only one winner in any case.**

- **Robots cannot win by pinning or lifting their opponents. Organizers will allow pinning or lifting for a maximum of 20 seconds per pin/lift then the attacker robot will be instructed to release the opponent. If, after being instructed to do so, the attacker is able to release but does not, their robot may be disqualified. If two or more 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.**

7)If a robot is thrown out of the central arena the match will stop immediately, and the robot still inside the arena will automatically be declared as the winner.

CENTRAL ARENA RULES

1)Points can be obtained by pushing your opponent to the blue area,red area,or out of the central arena.Points can also be obtained by immobilizing your opponent.

2)Points for pushing your opponent to blue area every time is 10.

3)Points for pushing your opponent to red area every time is 20.

4)50 points will be awarded for immobilizing your opponent.Same points will be awarded for pushing the oppponent out of the central arena(ie beyond red area).

5)It is to be noted that immobilizing and throwing the opponent out of the arena will be a case of direct knock - out.

6)Also if your robot accidently goes to the above mentioned areas points will be deducted accordingly and may even lead to elimination in case your robot goes out of the arena.

Criteria for certification

- **All participants will be given participation certificate.**
- **Winner team will given certificate of excellence and prize money**.

Event Specific Terminology:

- ***Disabled:*** **A robot is not functioning correctly due to either an internal malfunction, or contact with the opposing robot or Arena Hazard.**
- **Disqualification: A Robot is no longer permitted to compete in the current Robowars Tournament.**
- ***Immobilized:*** **In Judge's opinion, a robot is not responsive for a specified period of time.**
- ***Knockout:*** **Occurs when the attack or deliberate actions of one robot causes its opponent to become immobilized.**
- ***Lifting:*** **Occurs when one robot controls an opponent's translational motion by lifting the drive mechanism of the opponent off of the Arena floor.**
- ***No Contact:*** **Occurs when neither robot makes contact with each other for a specified period of time.**
- ***Pinning:*** **Occurs when one robot, through sheer force, holds an opponent stationary in order to immobilize it.**
- ***Radio Interference:*** **Refers to the situation where at least one robot becomes non-Responsive or non-controllable due to the effect of the other robot's remote-control signal.**

- ***Non-Responsive:*** **In a Referee's opinion, the robot cannot display some kind of controlled translational movement along the Arena floor.**
- ***Restart:*** **Occurs after a Fault or a Timeout has been declared and the competing robots are ready to continue.**
- ***Stuck:*** **A robot is hung-up on a part of the Arena, an Arena Hazard or an opponent, such that it is effectively non-responsive.**
- ***Tap-Out:*** **Occurs when a Robot's Operators decide that they no longer want to continue the Match, and concede the win to the opposing Team.**
- ***Technical Knockout:*** **Occurs when a robot wins due to immobilization of its opponent even though, in the Judges' opinion, no action of the winning robot caused the opponent's immobilization.**
- ***Timeout:*** **A temporary halting of a Match. Timeouts are usually called to separate robots, but can be called for other reasons as well.**

NOTE: In case of any discrepancy, decision made by the team "TantraFiesta 2k17" will be final.

COME 1 HOUR PRIOR BEFORE COMPTETION.
SCHEDULE IS SUBJECT TO CHANGES.

REGISTRATION FEE: INR 100 for participation.

- Stay tuned to our website tantrafiesta.me for registrations and updates.
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