

QUARK 2013

QUANTUM LEAPS



ROBOKOMBAT

PROBLEM STATEMENT

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Design a wired/wireless, manually controlled robot that is capable of overpowering its opponent in a battle against other bots.

Weight limit : Maximum of 25 kg.

Size : Maximum of 50x50x50 (in cm)

When all movable/extendable parts / weapons are fully compacted so as to occupy minimum space.

GAME PROCEDURE

1. During the match only **three** team-members will participate in competition (within the area demarcated for participants): one member will **control the bot**, another to help with **control wires** and the third member will **control the weapons** on the bot (pushers, flappers, cutting wheels, pneumatic weapons etc.) Teams are allowed to switch members in different matches.

2. **Rounds :**

2.1. **Qualifying** Round : This round involves pulling a weight of 15 kg on a trolley, a certain distance up an incline.(Angle will be specified later)

Criteria - Basic power criterion

2.2. **Round I : Three robots** will participate in this round with **one teams** advancing. (2 teams will be eliminated) Weapons are allowed and 4 dropping zones are available at your disposal.

Criteria - Strategy

2.3. **Round II : Three robots.** Basic arena weapons will be present. One team advancing.

Criteria - Strategy

2.4. **Round III : Capture the Flag. Four bots.** Four flags. Your objective is to destroy the opponent's flag. Weapons allowed. 4 dropping zones available. Number of participants are subject to change.

Criteria - Gameplay technique and Speed

2.5. **Round IV :** Details will be revealed prior to the competition. Their nature will be that of a **Death Match**, i.e. fight till either 1 is incapable of fighting. Number of participants per round may either be 2 or 3.

Criteria : Agility, Endurance, Aggressiveness and Strategy

3. **Elimination Criteria :** Either the robot is pushed into the **dropping** zone or is **unable to move for 60 seconds** leading to a knockout.

4. **Setup time :** 2 minutes

5. **Match duration :** 2 minutes for the Qualifying round. The remaining rules will be explained to the participants at the time of the event or just before the next round begins.

6. Weapons cannot be used to intentionally destroy the control wires (if any) of opponent bots. Damage to the arena will lead to disqualification of the bot and thereby the team. Care must be taken to secure control wires, as mentioned below.

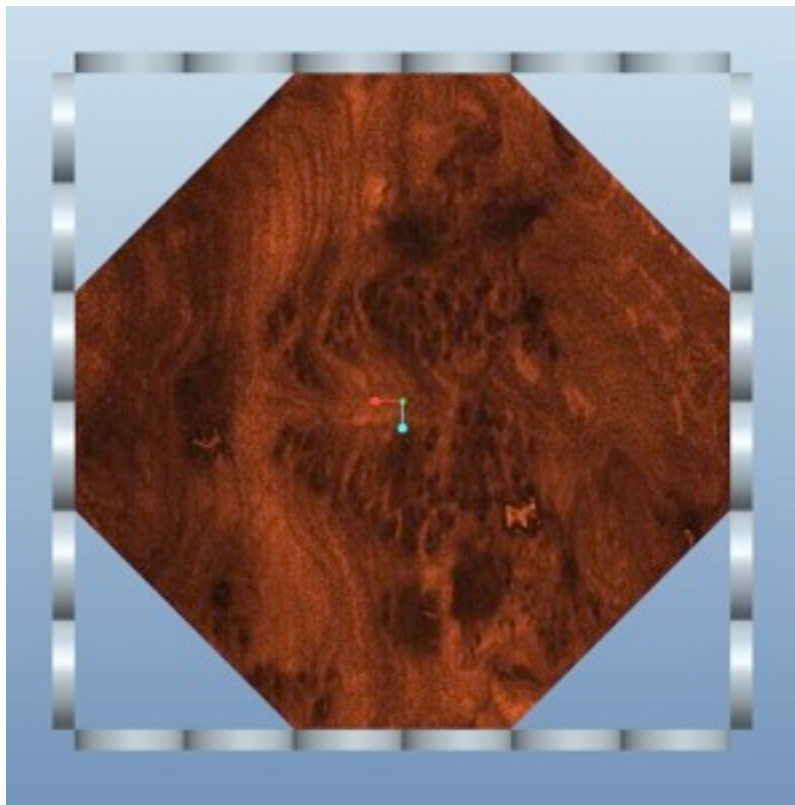
IMPORTANT INSTRUCTIONS :

1. Each team can register with a maximum of **FIVE** members and there will be a minimum of two rounds involving weapons.
2. Kindly **note** that in all of the above mentioned rounds, the **number of participants are subject to change** (Depending on the participation) and may be revealed just prior to the competition as well. But the **structure/format** of the round will still be the **same**.
3. Since, the event consists of **more than 2 rounds involving weapons**, it is therefore, suggested to concentrate on the **durability** of the robot and the weapon. It is also advisable to carry **spare parts** for external, damage prone areas and weapons.
4. It is mandatory for teams to undertake the following **precautions** to avoid damage to the wires during the game and also avoid tangling of the wires.
 - Metal rod of minimum 50 cm at the top of the bot to channel the wires out of the robot body.
 - Further, the wires should be encompassed within a flexible pipe for minimum 3 ft. (Or any other alternative which serves the purpose)
 - Any kind of exposed wiring (not covered by a pipe) should be held together by cello tape.

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5. Workshop for working on the robot will be made available during the festival for repairing the damages. Kindly get in touch with the Event Managers to avail access to the workshop.
6. In any given round, the decision of the Judges will be final and binding on all participants.

ARENA



The basic design of the arena. The arena is Octagonal, fit in a square of 12 X 12 ft as shown above. The arena will be bounded by a chain of tires, placed in an upright position, as shown above.

SAFETY

1. 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.
2. The machine would be checked for its safety before the competition and the team would be disqualified if their machine is found unsafe.
3. Participants must wear shoes during a match.
4. Participants are expected to abide by the rules & should co-operate with the organizers.
5. 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.
6. 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.

Kindly note that we are very strict about compliance with the above mentioned Safety measures. Any violations will lead to immediate disqualification.

BOT SPECIFICATIONS

BOT DIMENSION & FABRICATION :

1. The initial dimension of bot should not exceed **50 X 50 X 50 cm.** However, there is no limitation on bot dimension once the match starts.
2. The electrical voltage at any point of time in the machine should not exceed **40 V DC/AC.**
3. Any machine component should not be detached (intentionally) during any point of the war.
4. **Weight limit : 25 kg (Wired bot) & 30 kg (Wireless bot).**
5. Readymade gear boxes, parts, chassis, control circuits and remote control can be used.

BOT CONTROL :

1. In case of wired bots, the wires should remain slack at any instant during the fight. All the wires coming out of the machine should be stacked as a single unit. As mentioned above, the wires coming out of the bot should be contained in a pipe.(Or other alternative mentioned above).
2. Remote controls that are readily available in the market may also be used with suitable modifications if needed.

3. In case of wireless system, it should have a minimum two / three frequency remote control circuit or two dual control circuits or a transmitter-receiver paired module so that the frequency interferences with opponent team can be avoided (in case of any interference in the wireless systems, they will not be considered for rematch or in the results).

BATTERY AND POWER :

1. The machine can be powered **electrically** only. Use of an IC engine in any form is not allowed. Batteries must be sealed, immobilized-electrolyte types (such as gel cells, lithium, NiCad, NiMH, or dry cells). Since destruction is allowed batteries should be suitably and sufficiently protected from damage as far as possible.
2. Also multiple rounds may be conducted back to back so the batteries are advised to be kept fully charged with backup battery(s). It is advised to make provision for alternate power source such as a provision to use 230V single phase AC. The previous statement was advisory in nature but not compulsory.
3. The electrical voltage at any point of time in the machine should not exceed 40 V DC/AC. In case higher voltage is being used for weapons such as in cutting blade motors please mail the event managers and get their approval beforehand failing which teams may be disqualified.
4. 230V (AC) power will be provided (for wired bots).

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5. In case of wireless bots batteries should be placed on the bot itself and teams cannot use 230V AC external supply.
6. In case of wired bots teams can use external batteries.
7. All efforts must be made to protect battery terminals from a direct short and causing a battery fire. Failure to do so will cause direct disqualification.

WEAPONS SYSTEMS :

Robots can have any kind of cutters, flippers, saws, hammers, lifting devices etc. as weapons,

With the following **EXCEPTIONS** :

1. Pneumatics and Hydraulic
2. Liquid projectiles
3. Acid based Weapons
4. EMP generators
5. Any kind of flammable liquid
6. Flame-producing weapons
7. Any kind of explosive material.
8. Radio jammers
9. Any other weapon that might cause damage to the arena .

VIOLATIONS

1. If the bot operator is seen to be using the wire from the controller to pull, move or hold the bot, i.e. if the wire becomes taught at any point, the team will be disqualified.
2. All efforts must be made to protect battery terminals from a direct short and causing a battery fire, failure to do so will lead to direct disqualification.

Kindly keep checking the website for any updates on the problem statement and any other additional information or resources, soon to be put up.

Team Specifications :

Minimum : 1 members

Maximum : 5 members

CONTACT DETAILS :

In case of any queries or any clarifications, kindly drop us an email at robokombat@bits-quark.org, or get in touch directly with the Event Managers :

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