



# ROBOCALYPSE PROBLEM STATEMENT

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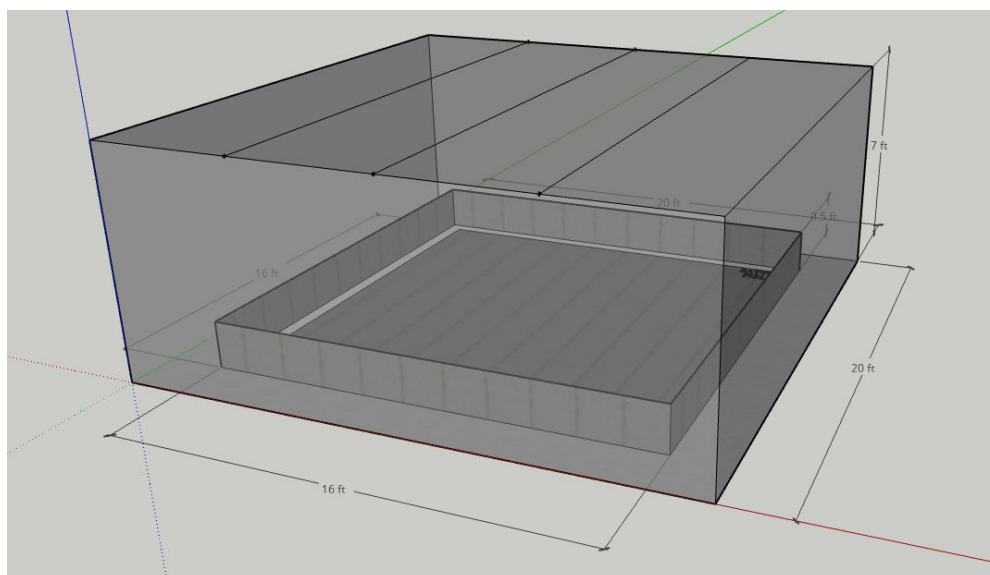
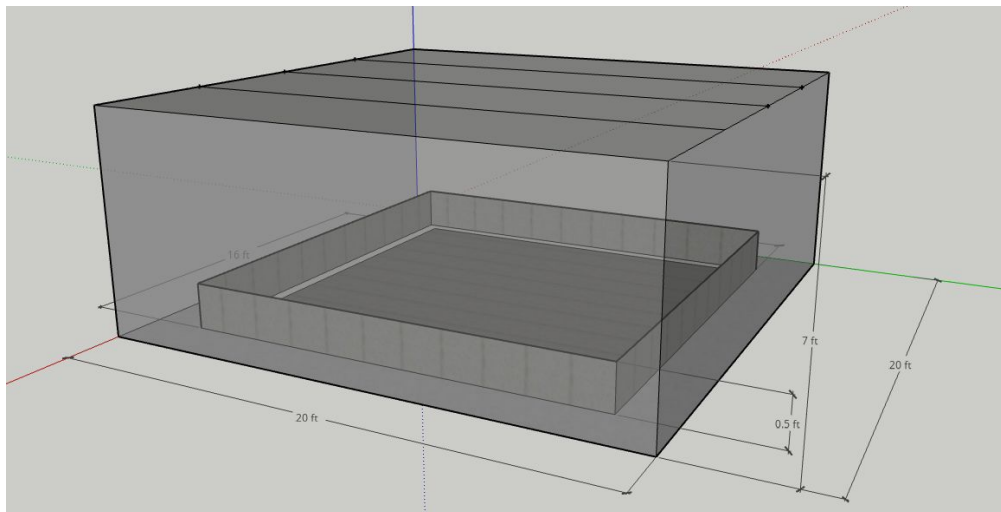
## AIM:

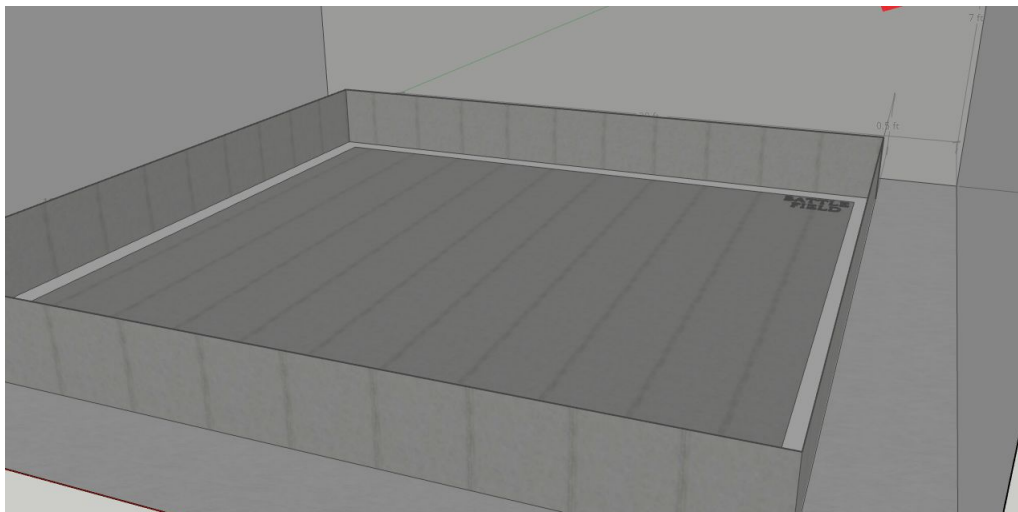
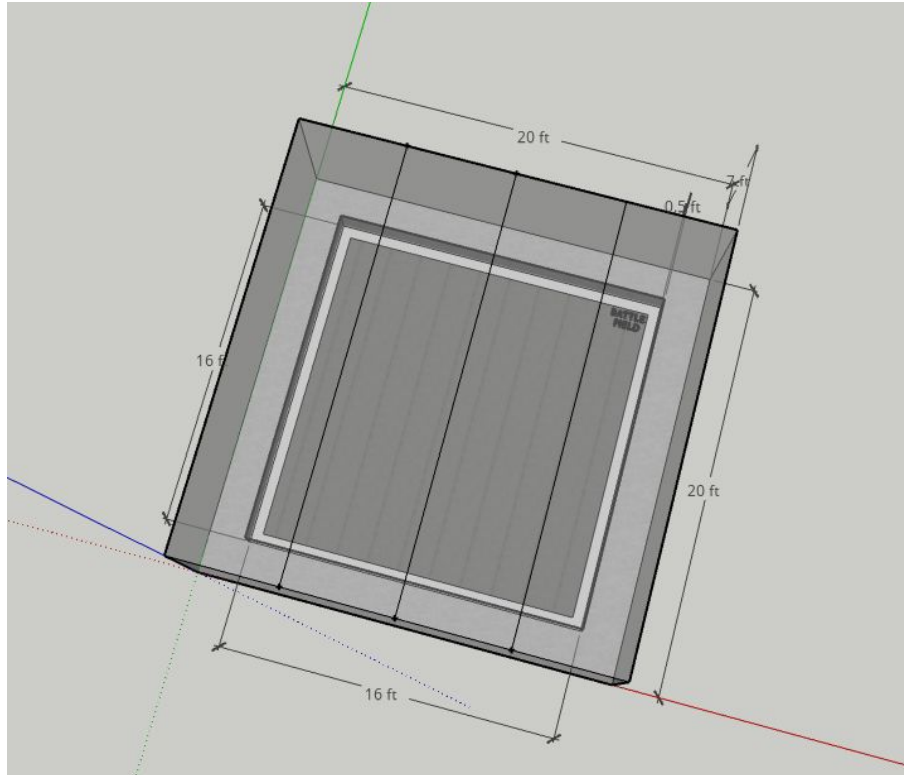
The objective is to make a wireless, manually controlled bot that can immobilize the opponent bot in a one on one knock-out match.

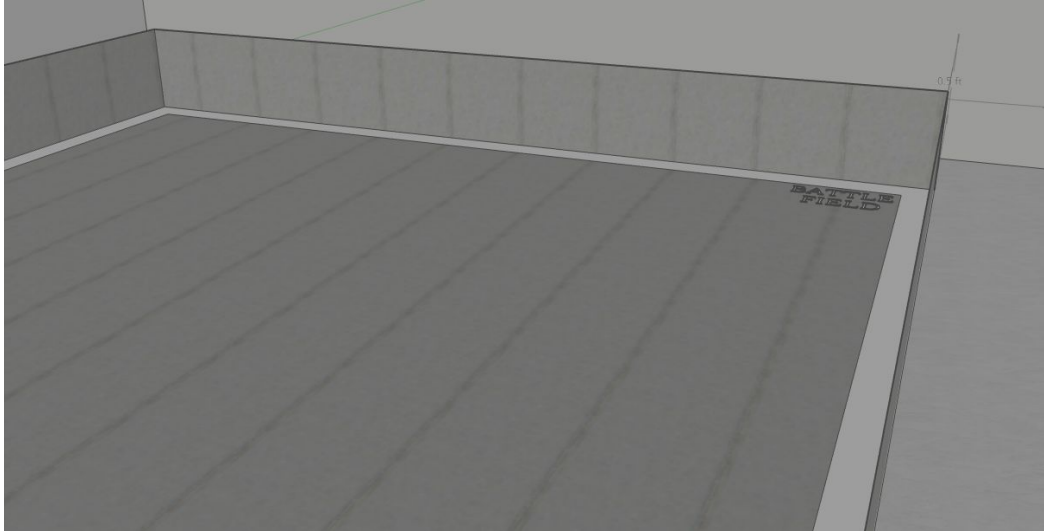
## ARENA:

The boundary covered with polycarbonate sheets 20ft x 20ft (lxb)

The metal battle field is of 16ft x 16ft (lxb)







## SPECIFICATIONS:

### Bot Specifications:

The bot should not exceed the stated dimension i.e 750mm x 750mm x 1000mm (l x b x h) at any point during the match.

- External device used for control are not included in the size constraint.
- The weight of bot should not exceed 60 kg , including the weight of pneumatic source/tanks.
- The weight of adapters and the remote controller will not be included, in this constraint Mobility.
- All robots must have easily visible and controlled mobility in order to compete.

### Control Requirements:

- The machine can be controlled through wireless remote only. Power supply should be on board only. Refer below for further details on battery and power.
- All the robots with wireless control should be able to change frequencies (if required) or coded channels to prevent any radio conflicts, it may be changed before the start of the race to avoid frequency interference with other teams.
- Remote controls available in market can also be used.



- Team should pair the wireless remote with the machine(bot) before entering into the arena.

## Battery and Power:

- The machine(bot) can be powered electrically only. Use of an IC engine in any form is strictly not allowed. On board batteries must be sealed, immobilized-electrolyte types (such as gel cells, lithium, NiCd, NiMH, or dry cells).
- The electric voltage between 2 points anywhere in the machine(bot) should not be more than 36V DC at any point of time.
- All efforts must be made to protect battery terminals from a direct short and causing a battery fire, failure to do so will result in direct disqualification.
- Usage of damaged, non-leak proof batteries will lead to direct disqualification.
- Special care must be taken to protect the on-board batteries. If judges or organisers find any lack of proper protection, then team will be subjected to disqualification.
- Change of battery during a match will not be entertained at any cost.
- Only bots with on board batteries are allowed to participate in the said event.
- It is suggested to have an extra battery charged and ready during competition so that on advancing to next level, the team will not face any delay in the conduction of the said match.

## Pneumatics:

- Robot can use pneumatic devices actuated by pressurized non-flammable gases. Maximum allowed outlet nozzle pressure is 8 bar. The storage tank and pressure regulators used by a team needs to be certified.
- Upon any discrepancies participants must be able to display the used pressure with integrated or temporarily fitted pressure gauge and also, there must be provision for organisers to check the cylinder pressure on the bot as and when asked.



- The maximum pressure in cylinder should not exceed the rated pressure at any given circumstance.
- Team must have a safe way of refilling the system and determining the on board pressure.
- All pneumatic components on board the machine(bot) must be securely mounted. Care must be taken while mounting the pressure vessel and armour to ensure that if ruptured it will not escape the machine(bot). The terms 'pressure vessel, bottle, and source tank' are used interchangeably.
- Overall pneumatic setup must be on-board, no external support (from outside the arena) can be given to the machine(bot) for the functioning of its pneumatic system.

## Weapons:

Robots can have any kind of magnetic weapons, cutters, flippers, saws, lifting devices, spinning hammers etc. as weapons with following exceptions and limitations:

- Liquid projectiles.
- Any kind of inflammable liquid.
- Flame-based weapons.
- Any kind of explosive or intentionally ignited solid or potentially ignitable solid.
- Nets, tape, glue, or any other entanglement device.
- High power magnets or electromagnets or heating devices.
- Radio jamming, Tasers, tesla coils, or any other high-voltage device.
- Tethered or untethered projectiles.
- Caution: spinning weapons are not allowed touch the arena ground in a standby mode.

## ABSTRACT:

The written abstract should be prepared on the following lines:

The weapon systems and power supply method should be explained in detail, along with proper diagrams. Pictures depicting the above must be attached.



- Functioning of wireless remote and the frequency or any other wireless module used for wireless remote must be explained in detail.
- Description of any special advantageous mechanism used must be given. The specifications of all the components used, including motors, suspension springs, remote controller, wires, battery etc. have to be mentioned properly.
- Team can email the abstract and send the video later. This will make sure that at least the abstract part of your portfolio reaches us before the deadline.
- Email must be sent to [robotics.techniche@gmail.com](mailto:robotics.techniche@gmail.com) in pdf and ppt format.
- An email will be sent to the team leader confirming the receipt of the entry. Each team is allowed to make online submission only by email. In case of multiple submissions, only the first submission will be used for judging purposes.
- All submission must be made online before the deadline.
- Soft copy of the permission regarding pneumatics must be mailed to before deadline. Hard Copy of the permission must be brought during the competition. Teams failing to do so, will not be allowed to participate.
- Deadline for submission of Abstract for ROBOCALYPSE is 10th August 2019. Further instructions for abstract submission will be sent by mail to registered participants only.

## VIDEO ABSTRACT:

- The video should be of at least 1 minute with the unedited clip showing the machine(bot) performance to the fullest. All destructive mechanism(s) being used must be shown working. We may demand another clip on a later stage to the participants who qualify Round 1. Instructions for the same will be sent by mail to such participants. Last date for submission for first video is 20th August.
- It is not necessary to explain the mechanisms in the video. All abstracts will be used strictly for seeding purposes. The elimination procedure will be objective and the evaluation of every participant will



be published on the website. Techniche assures total privacy of the matter submitted to us. The portfolio of your machine will be helpful in future as an evidence of your hard-work along with determining your position for the competition. Hence, please pay adequate attention to it.

- All submissions must be made online before the deadline.

NOTE: This video abstract will not be the sole criteria for selection of your robot to perform at ROBOCALYPSE, TECHNICHE. Judges will go very thoroughly over the video and written abstracts both and then shortlist the robots which would be allowed to perform in the competition here at TECHNICHE. The portfolio is meant to assess the efforts put in by participants. Thus even if you are not able to meet the requirements asked in the portfolio, please send us the portfolios based on the current state of your machine before the deadline. That means that even if your machine is incomplete, please send the portfolios anyway, instead of not sending them or sending them late.

## GAMEPLAY:

- A robot is declared victorious if its opponent is immobilized.
- A robot will be declared immobile if it cannot display linear motion of at least two inches in a timed period of 30 seconds countdown.
- In case both the robots remain mobile after the end of the round then the winner will be decided subjectively.
- A robot that is unsafe, as deemed by the judges, will be disqualified immediately and the opponent robot will be declared as the winner.
- Every match will consist of 3 rounds of 2.5 min each and each subsequent round will have a time gap of 45 sec.
- Robots cannot win by merely lifting their opponents. Organizers will allow lifting for a maximum of 20 seconds for each lift and then the attacker robot will be instructed to release the opponent. If, after being instructed to do so, the attacker is unable to release, their robot may be disqualified.



- Points will be given on the basis of aggression, damage, control and strategy.

**Aggression** – Aggression is judged by the frequency, severity, boldness and effectiveness of attacks deliberately initiated by the robot against its opponent. If a robot appears to have accidentally attacked an opponent, that act will not be considered Aggression.

**Control** – Control refers to a situation wherein a robot is able to attack an opponent at its weakest point, use its weapons in the most effective way, and minimize the damage caused by the opponent or its weapons.

**Damage** – Through deliberate action, a robot either directly or indirectly reduces the functionality, effectiveness or defensibility of an opponent. Damage is not considered relevant if a robot inadvertently harms itself. Also, if a pressure vessel or a rapidly spinning device on a robot fragments, any damage to the opponent will not be considered "deliberate".

**Strategy** – The robot exhibits a combat plan that exploits the robot's strengths against the weaknesses of its opponent. Strategy is also defined as a robot exhibiting a deliberate defence plan that guards its weaknesses against the strengths of the opponent.

## GUIDELINES:

If there is any kind of ambiguity in selection of weapon systems, please clarify the same with the event organizers to avoid further confusion.

- If the organizers doubt the safety of viewers due to a particular bot, then that team might be denied participation.
- The bot is not allowed to leave anything behind during the run. It should not leave any mark on the arena. Any bot found damaging the arena will be immediately disqualified.
- The time measured by the organizers will be final and will be used for scoring the teams. Time measured by the contestant by any means will not be considered for scoring.
- In case of any disputes/discrepancies, the organizers' decision will be final and binding. The organizers reserve the right to any of the above





rules as they deem fit. Changes in rules, if any will be notified to the team leaders through mail.

## TEAM SPECIFICATIONS:

- A team may have a maximum of 6 members.
- Participants from different educational institutions may also form a team.
- A team can register as two separate teams if they are using two different bots for the event ( In case both the bots reach the semi-finals only one of the teams bot is eligible to participate and the choice is left to the team itself.)

## Contact Us:

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Register at: <https://techniche.org/robotics>

For more details, mail us: [robotics.techniche@gmail.com](mailto:robotics.techniche@gmail.com)