

MRO - Big Challenge 2018

Description, Rules and Regulations.

Introduction

The BigChallenge is an open competition specifically aimed to 16+ students following undergraduate studies, as well as advanced hobbyists. The aim of such national initiatives is to involve emerging students studying in the field already as well as high-achieving students in a restricted and regulated competition environment. Since we would like to see a synergy between student levels in this challenge the scoring takes into consideration mixed teams preferably offering high-achieving students an opportunity to work with higher-education teams.

Finality of Rules Interpretation

The MRO competition board shall make the interpretation, and application, of the BigChallenge Rules and Regulations. Its decisions shall be final and binding. In order to promote the sport of robotics challenges, to achieve prompt finality in competition results, and in consideration of the numerous benefits to them.

Description

The Big Challenge is in a timed obstacle course made up of 7 stages, each stage offering its unique challenges. The design of the competition course will be released by the end of May of every year. The actual course during the challenge will strictly follow the build design issued in May the previous year. The Big Challenge is judged by a panel of independent judges which will be not less than 3.

Team Make-up

There are no rules and regulations determining the team make up. Each team can be made up of as many members as you would like, however if the team is made up of more than 4 members there will be a 5 point reduction for each extra team member (to a maximum of -10points) which will be taken out as a handicap from the event total score. There is also no age restriction for the team members. However, each member having a team member which is under the age of 15 by 30th December will be awarded 5 points for each member (to a maximum of 10 points)

Scoring

The scoring of the event was kept simple to make the competition as transparent as possible. The obstacle course is divided in 7 sections each with their own challenges. For every section the robot completes successfully the team will be awarded 10 points.

Equal Scoring Possibility

Yes, there is a possibility that more than one team will be end up with the same score, in this occurrence the preference for standings will be down to the completion time of the whole course or the completion time of the previous section in case of non-completion.

Successful completion of a section

The team will only be awarded the points after the robot has completely surpassed the section. Each section is marked with a visible boundary. The whole robot must be out of the section to the awarded the points.

In case of non-completion

Yes, there is a possibility that your robot will not complete the whole course, this does not mean you are out of the competition. Your team captain can call for a course run termination through a remotely operated device at the computer station. Once the team captain presses the Run Termination button the timer will stop and the scores calculated. If the robot is for example in section 6, the scores will only be counted up to section 5.

Course Completion

The completion of the course is obvious and evident, again this was done to ensure transparency in the scoring and judging process. The total course completion can only happen in one way, by activating the Goal push button at the end of the course. The activation of the goal button will stop the timer as well as award the team 20 points for section 7 instead of 10. If the Robot terminates its run at section 7 without successfully completing the course (and only on this exception) the points will be calculated on all 7 sections and not until section 6 as in standard non-completion.

Run-Termination Process.

The run termination button will only be accessible to the team captain. If the run-termination button is pressed by any other team member the team will be disqualified. In case the robot is stuck or has a malfunction the timer will keep going until the run-termination button is pressed. The team captain must also shout "Terminate Run!", since in case of timer failure the judges will also be timing the event with chronometers. If the terminate button will be pressed without shouting the "Terminate Run" the team will suffer a 3 points deduction.

Start Timer

The start timer will be set when the robot completely leaves the start bounding box.

Penalties

The idea of the creation of the big challenge is to have a competition of a higher level with strict rules and regulations. Any deviation from the rules and regulations will mean instant disqualification.

Inspections and Support

As part of the competition the organisers are offering technical support for all teams and as part of the competition the team will have inspections during the build of the robot, the first inspection will happen in November and the second inspection will happen in January.

A special closed facebook group was created at:

<https://www.facebook.com/groups/264442924064714>

You will only be allowed access to this closed group once you submit your registration, all BigChallenge announcements and updates will be done through this group only and not by e-mail. This group will be used for technical support and collaboration.

Official Registrations

To register your team you must fill in the form located at:

<https://goo.gl/forms/09awpxqKdBfHGd2T2>

until the 15th of November 2017 applications after this date will not be accepted.

Robot Technical Rules and Regulations

Important: Ready Made Robotics Platform are NOT allowed

Form Factor

There are no regulations governing the form factor of your robot, however the following will be enforced.

Score weighting on form factor:

Wheeled Vehicle: -15 points

Tracked Vehicle: -10 points

Bi-Pedal Robot: +10 points

Construction methods points awards:

Entirely 3D Printed: +3 points (100% 3d printed - apart from electronic parts)

Ready made models (which are downloaded cannot be used, 3d printing model designs have to be designed and modelled by the team)

Mostly Recycled Materials: + 5points, (All electronics and body parts must have been used before in a previous project)

Green Robot: +15 points, green robot must have a power regeneration facility and/or obtaining operational power through alternate energy such as HHO generators, Steam Generators, Air Motors, Solar Power Charging.

Restrictions

The Robot must be autonomous, this means, that from the starting position the robot must have no human input to tackle the obstacle course. Ready Made Platforms are not accepted for this challenge.

Electrical

- The robot can only have one battery with the following maximum specifications: 5,000mah, 6s configuration (or less) and upto 20c discharge rate.
- The robot is only allowed two independent power rails, one running at 6v Max and the other at 12v max. If any power rail exceeds this voltage there will be a deduction of 10 points.
- The battery technology MUST be Lithium Polymer.
- The robot must have a main power emergency cut-off switch accessible from the outside, it have to be flush with the outer skin of the robot and must not require any disassembly to be activated. This power cut-off switch will be tested under nominal operation by the judges during the weigh-in. If this emergency cut-off switch is found to be not working the team will not be allowed to run the course. *(so please make sure you check them well)*
- The battery must be strapped to the main body of the robot and covered to contain any bloating or in an event of a battery being compromised the containment of the liquid.

Computational

- There are no limits on the computational power of your robot. However, the computational power of the robot must be contained and all processing must be done on the robot itself, you cannot rely on outside data connections such as bluetooth, wi-fi and radio waves.
- Computer Vision: Computer vision is encouraged in this competition, real use of real-time computer vision to tackle the obstacle course will be awarded 3 points.

Mechanical

- Does not exceed the operational width of 50cm
- Does not exceed the operational length of 55cm
- Does not exceed the operational height of 75cm
- Does not exceed the operational weight of 20kg (including battery)
- We all love our robots and there is also a 5 point award that will be given to only one team for the best looking robot (this will be decided by the judges exactly following the weigh-in).

Weigh-In

- Before the course run the robot will be weighed and measured by the judges.
- The robot in its starting position cannot exceed the weight of 15Kg (including battery)
- The robot cannot exceed the operational width of 40cm and length of 45cm
- The weigh-in is only valid if done on the MRO calibrated scale.
- If the robot exceeds 15Kg it will be disqualified and not allowed to run the course.

Running the course

- The first day the course is reserved for test runs by the teams.
- During the big challenge there will be two runs for each team. One pm Saturday Morning and one on Sunday Morning
- The running order will be set at random by draw. The draw will be on the first day of the MRO and the Big Challenge will happen on the 2nd and 3rd Day of the MRO
- The best score from both runs will be chosen to represent the final score for the team
- You can only physically touch your robot once the run is terminated. If the robot is touched by any team member whilst the run is still active you will be disqualified

Respect and Collaboration

This challenge is aimed to bring out the best in you and although we understand that a bit of competitive nature is also healthy we demand respect from all team members towards all others. It is also encouraged that members work collaboratively in a maker environment with participating in technical questions and solutions.

Media Coverage

Upon registration for the BigChallenge all team members agree to a media release agreement, that any footage or marketing material can be presented. It is important that the organisers are aware of any and all media coverage taking place. The MRO organising committee has to approve everything before it gets published. If any media coverage happens without the expressed permission of the BigChallenge organiser your team will be instantly disqualified. We take matters like this seriously since we want to preserve the quality of the event. To make this process easy you will have direct access to one of the organisers.

Making Use of Specialised Tools

In the case of private entry teams which don't have access to specialised tools, such as 3D Printers, Metal Working Stations, Electronics Stations. The Ministry will make equipment available by appointment. Such appointments can be discussed with the organisers.

Online Media and Promotion

No team is allowed to promote their build online without mentioning the MRO page and tagging the post with a direct link to the MRO facebook page. The teams will make their

builds available in the case of scheduled filming or photography.

Commitment towards the event and obligations towards the main sponsor.

It is important to note that the BigChallenge is part of a wider group of events in the MRO, hence we feel that each team should show commitment towards the event and the organisers. Withdrawals late from the competition are extremely discouraged as these cause monumental administration problems and delays, hence any team which withdraws their entry will be banned from competing in future MRO events.

Such events require substantial investment which is usually augmented via corporate investment. We would like to make it clear that respect should be shown to the main sponsor of the event and be treated as one of the organisers. The main sponsor might ask but is not limited to stickers or logo placement on the robot itself as well as an apparel being used by the team. The main sponsor may also supply apparel for the teams which they must adhere to. The main sponsor might also request scheduled filming or ongoing marketing operations, each team will do their utmost to uphold these requests. Such requests can only be refused by the organising committee.

Extenuating Circumstances

On the other hand, we do understand that life happens sometimes, hence if you need to withdraw your entry because of extenuating circumstances please contact the organisers for further guidance.

Tentative Schedule (subject to change)

Registration Open: Monday 2nd October 2017

Registration Close: 15th November 2017 at Midnight

MRO Day 1: Friday 20th April 2018

MRO Day 2: Saturday 21st April 2018

MRO Day 3: Sunday 22nd April 2018

Scheduled Visit 1: 15th January 2018 – 19th January 2018

Scheduled Visit 2: 5th March 2018 – 9th March 2018

Awards

The 2018 BigChallenge there will be the following awards:

- First Place BigChallenge Winner (calculated on scores) – MAIN
- Second Place BigChallenge (calculated on scores) - MAIN
- Best Engineered Robot Award (scored by the judges) - Secondary
- Best Use of Technology (scored by the judges) - Secondary