

robotex

International '20

GIRLS FIREFIGHTING RULES

Kelly Olvi

Kelly.olvi@robotex.ee



Table of Contents

Table of Contents	2
1 Introduction	3
2 Contestants.....	3
3 The Field.....	4
4 The Robot	7
5 The Competition.....	7
6 Scoring.....	8
7 Organization	9
8 Changes and cancellations in the rules	9
9 Appendix 1. Scoring matrix.....	10
10 Revision history	11

1 Introduction

Robotex Firefighting is a competition for all females around the world to encourage them to partake and learn about technology and engineering.

The object of the competition is to create a robot that can locate and extinguishing 4 randomly placed candles, without touching them, inside a field outlined by a black line.

The aim of the firefighting competition is to raise more engineers and IT-specialists. We have taken it for our mission to change the ratio of boys and girls, in the ordinary robotics competition fields. We hope to see many eager participants, whose passion for robotics, technology, programming, electronics, mechanics and everything digital era related, would carry on and give courage to all the women and girls in the world!

2 Contestants

1. The maximum number of competitors in a team is 5 people.
2. Competitors can only be female.
3. Team mentors can be both male and female.
4. Robotex 2018 Firefighting will be held in two age groups:
 5. Class A Up to 13 years,
 6. Class B 14+ years.
7. The age group of the team is determined based on the age of the oldest team member.
8. Competitors must register themselves into the class they will belong to on the day of the competition, not on the day of registration.
9. Team must be registered to the correct age category in order to avoid disqualification from the competition. **NB!** Teams who belong to the younger age group based on actual age can compete in the older age group if desired.
10. The organizers reserve the right to check the age of the competitors during the competition and in case of violation of the age rule, the robot will be disqualified.

3 The Field

1. The field area is white with dimensions of 2.5 x 3.5 m. The field is made from white PVC polyester fabric which has B1 flame resistance. The circles are made from the same PVC material and placed on top of the field.
2. The field is surrounded by a 25mm black line, as seen on the picture below. There is an extra 200mm white area outside the black borderline.

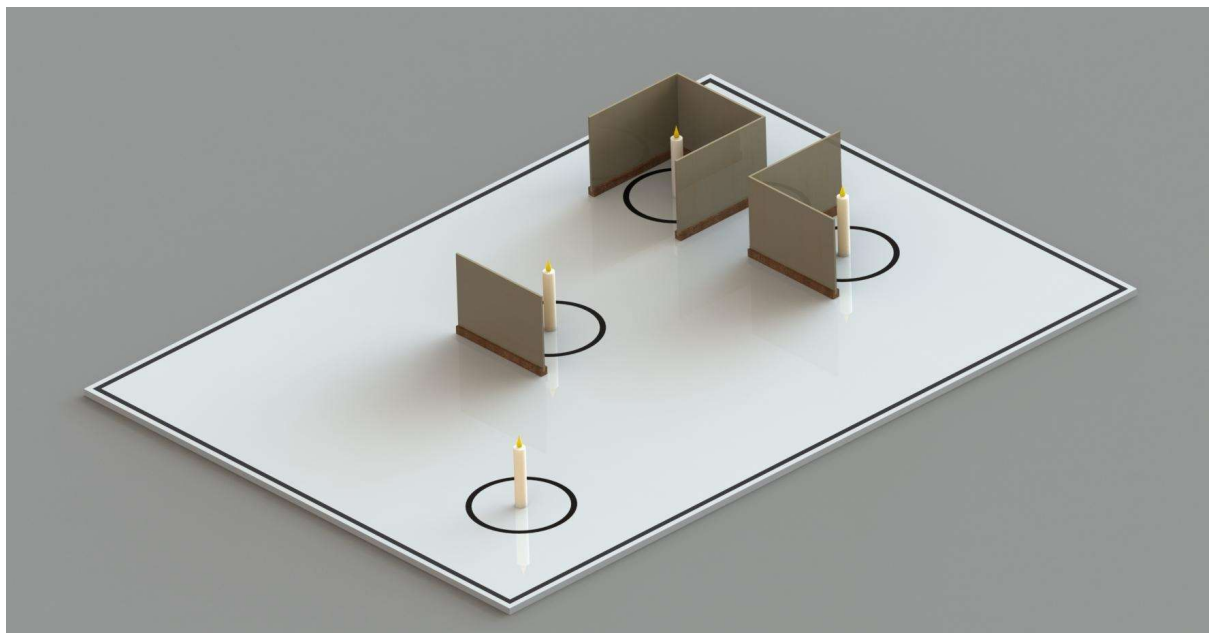


Figure 1 (Example of the field and a candle combination)

3. The competition area dimensions are at least 3.5 x 4.5m, which includes the field. The area is intended for the team members operating the robot during the run. Each competition area is surrounded by white walls.
4. Candles and walls will be randomly placed for every run. There will be a minimum of 10 different combinations of candles and walls prepared for the challenge.
5. Candles stand at the center of a white circle, surrounded by a 25mm diameter black circle.
6. The candles vary in heights according to age groups. Candles in Class A have a height of 100 mm. In Class B the heights vary between 100 mm to 400 mm.

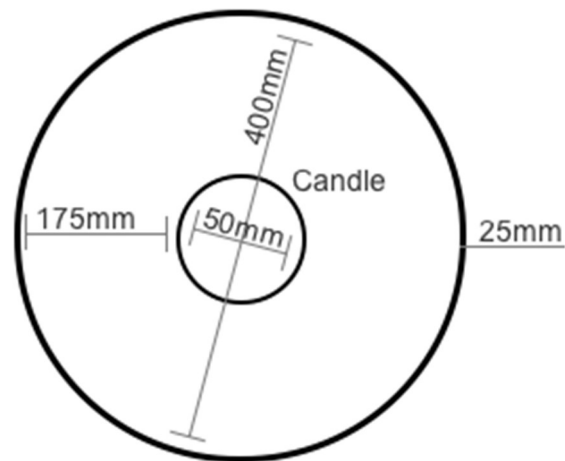


Figure 2 (Candle with the surrounding line)

7. In both age groups the candles are blocked by walls:
 - 1 candle - No wall
 - 1 candle - 1 wall
 - 1 candle - 2 walls
 - 1 candle - 3 walls
8. 8. The wall widths vary from 200mm to 350mm and are 400mm tall. They are held up by wooden bases that are 45mm tall and may span the approximate width of the wall. **NB!** Note that two walls may have gaps between the connections.
9. 9. The challenge may be held in areas with natural light present which may change the lighting conditions of the track. Be prepared to engineer around this natural condition.

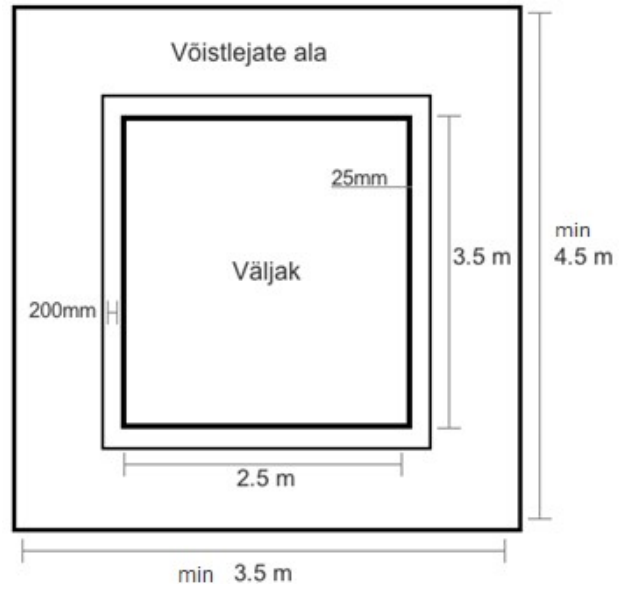


Figure 3 (The field)



Figure 4 (Top view of the field)

4 The Robot

1. Robots must be autonomous.
2. The maximum dimensions of the robot at registration and in the beginning of the run are 200x200mm (length x width). The robot can expand during the competition up to 300x300mm (length x width).
3. The robot can weigh up to 3kg.
4. The robot must have a start and stop button or a remote control (recommended).
5. Robots are forbidden to damage the field and endanger the spectators.
6. Robots can use any type extinguisher to put out the candle fire but are not allowed to damage the field and endanger the spectators.
7. The field must stay clean after the run. If needed, the team must clean it quickly right after their run.

5 The Competition

1. The robots will start each heat at a spot along the border as chosen by the challenge coordinator.
2. A run starts with the referee's signal.
3. The robots must start moving in 5 seconds after they have received the start command. If the robot hasn't moved within 5 seconds, the run will be considered as DNF (did not finish).
4. The first candle will be in plain view of the robot at the start of the challenge.
5. Competition is held in two parts: initial heats and championship round.
6. Each robot has 3 minutes to extinguish the 4 candles in every run.
7. In the initial heats and final round every competitor has 3 runs. Scores of the 3 runs will be summed together.
8. In the final rounds every competitor has 3 runs. Scores of the 3 runs will be summed together.
9. Only competitors can operate and manipulate the robot during the heat.

10. If a competitor touches the robot after the challenge has begun, the time stops, the run ends, and the challenge will be scored based on the number of candles extinguished before the robot was touched.
11. If the robot leaves the field, the time stops, the run ends and the challenge will be scored based on the number of candles extinguished before the robot left the field. Robot is counted as out of the field when none of the four wheels are in contact with the black line surrounding the field.
12. Heats will be drawn or randomly appointed at registration.
13. The heats and their approximate time will be announced via email after the registration.

6 Scoring

1. The points are given out based on the number of candles extinguished. (See Appendix.1 Scoring matrix)
2. There will be a "time bonus points" awarded, when all four candles are extinguished before the 180 second time limit is up. The seconds remaining before the run time was up will be added to the score.
3. The process of extinguishing the lit candle is defined as: Entering the circle, extinguishing, and leaving the circle. During this time the robot cannot make contact with the candle.
4. When a candle is extinguished outside the circle, only 50% of candle's value will be taken account. Robot is counted as inside of the circle when at least one wheel is in contact with the black line.
5. When the candle is extinguished and falls, only 50% of candle's value will be taken account.
6. Previously extinguished candles become obstacles in the playfield, and do not count as a penalty if touched.
7. The initial heats consist of 3 rounds. The score of the 3 runs will be summed together.
8. Top 25% robots are going to compete in the final round.

9. The final rounds consist of 3 rounds. The score of the 3 runs will be summed together.
10. The top-three is formed of the highest scored robots.

7 Organization

1. Official tracks will be available to practice on when not in use by competitors attempting an official run or the organizers haven't given different directions.
2. The robot must be registered before the competition. The registration process includes technical inspection of the robot, marking the robot with a number sticker and testing the start and stop functions.
3. Technical inspection must be completed by the time specified by then organizers.
4. All questions and problems that arise during the competition are solved by the referee.
5. The final decision regarding any appeals is made by the referee and/or the organizers. All complaints must be reported to the referee during the match or right after the ending of the match. Complaints filed later will not be accepted. The final decision regarding any dispute or inconsistencies, is always made by the referee and/or the competition organizers.

8 Changes and cancellations in the rules

Changes and cancellations made to the rules are adopted by the main organizer of the competition according to the regulation of the regulatory committee of the competition.

9 Appendix 1. Scoring matrix

	Number of candles extinguished				Total possible score
	First (No walls)	Second (One wall)	Third (Two walls)	Fourth (Three walls)	
Full Points	100	200	300	400	1000
Half points (see 6.4 ja 6.5)	50	100	150	200	
Time Bonus: Clock counts down from 180 seconds and stops when the robot extinguishes the fourth candle (see 6.2)					180

Table 1. Scoring matrix

10 Revision history

1. 09.06.2020 Paragraph 3 Nclause 6. Removed the exact diameter of the candle.

