# HAJDÚBÖSZÖRMÉNYI ROBOTOLYMPICS

## Competition announcement

2025.

"Every good book is a teacher of the nation" (Gárdonyi) Foundation

# Content

**Since 2012, the Bocskai István High School in Hajdúböszörmény and the "Every Good Book is a Teacher for the Nation" (Gárdonyi) Foundation have been organizing the Robot Olympics every year, where teams and robots have to compete in pentathlon.**

# Aims

In preparation for the competition, the teams cover the entire vertical of the technical career, which is very important today, from the birth of the idea, through design and construction, to programming and testing. It is a great pleasure for them when the robot they designed and built themselves reaches the finish line before the others.

We consider it important that the competition be completely public, in order to promote the technical track. In addition, the spectators' cheering greatly helps the teams to return home with a positive experience.

Since robotics is considered the science of the future, with this competition we prepare primary and secondary school students for the 21st century.

# Structure

During the construction of the competition, we aimed to present different challenges to the teams and robots. The five events are as follows: obstacle course, darts, maze, sumo, and slalom. The speed of robots in obstacle running, accuracy in darts, and strength, creativity and innovation in sumo are the qualities that robots can use to help their teams win. The contestants are tasked with building and programming a robot that possesses these capabilities. This is not an easy task. Still, students surprise me year after year with their solutions, creativity and innovations.

This competition is becoming more and more popular. This is also shown by the number of teams that applied for the competition. While in the first year there were 11 entrants, in the second year 23 teams, in the third year 31 teams competed for the gifts, and in 2019 80 teams competed for the gifts. Unfortunately, in 2020 and 2021, the RobotOlympics were cancelled due to COVID, but it was held again in 2022. In 2023 and 2024, 72 teams each entered the competition.

Not only more and more teams entered the RobotOlympics, but students also traveled to us from further and further afield. Thus, the competition, which was initially limited to the county and its catchment area, became popular first in the region, then in the areas east of the Danube, and later in Transdanubia. This competition also offers students the opportunity to prove their knowledge in an international environment and to establish international relationships between students, talent management workshops, study groups and schools.

**The tasks of the competition are given to the teams in advance, but some details are only revealed to them during the competition (e.g. the location of obstacles). This way, the teams can prepare for the race, but the robot must be adapted to the exact task and environment on site. The fact that the students prepare for the competition at home – even with the help of the teacher – does not cause a problem, as the primary goal is learning. During the preparation, the teams gain a lot of useful knowledge, which knowledge they can apply when learning mathematics, physics, information technology, digital culture subjects, and vice versa, they can use what they have learned earlier in practice, so it is more deeply integrated and fixed.**

The tasks can be read in detail on the RobotOlimpia website (http://bighb.hu/index.php/robotolimpia-2025) and on the RobotOlimpia 2025 facebook event page (https://fb.me/e/64z66Sp8S).

# Remuneration

We also consider it important that as many participants as possible receive gifts. That is why we award the first three teams in each event, and why we also announce the results in the overall category. This way, we can give at least 18 prizes to the best teams. The teams will receive a certificate, medal and gifts.

We also strive to give every participating student and teacher a small gift and a commemorative certificate for the teams.

# Registration

**There is no entry fee!**

We are expecting two- or three-person primary and secondary school teams to enter the competition **until midnight on May 2, 2025** on the following online interface. Questions are accepted at the olaht@bighb.hu e-mail address.


https://forms.office.com/e/FB57p8SDnX

The list of entered teams will be available on the RobotOlympics website (http://bighb.hu/index.php/robotolimpia-2025).

# Race Time

**31 May 2025 (Saturday)**

# Venue

Bocskai István Primary School Sports Hall

4220 Hajdúböszörmény, Iskola u. 4. GPS: 47.674041, 21.505852

# Patrons

**Lajos Árpád Tóth** , Director of the Hajdúböszörmény School District Centre

# General rules

**Each team can start with one robot.**

**Each student can only be a member of one team.**

**A team cannot compete under more than one name.**

**A robot can only be started by a competitor.**

**Robots cannot be started from an external device (laptop, tablet, phone, etc.).**

**During the races, the robot must not use wireless communication.**

## Rules of robot building:

Each robot must be built to be 100% openable and built with authentic LEGO components. (Gluing, cutting, melting or any other modification is not allowed by the basic rules). This rule also applies to sensors and motors.

The base robot must fit in a square with sides of 1 foot (1 foot = 30.48 cm).

**The robot cannot be rebuilt between events. It does not count as a rebuild in the case of sensors and motors pre-built on the robot if the cables are connected from one sensor (motor) to the other sensor (motor).**

**Before the Darts competition, the necessary additional arm can be installed and removed from the robot after the throws.**

The height of the robot can be arbitrary.

The base of the robot must be a LEGO brick (NXT or EV3 or Spike).

The weight of the basic robot participating in sumo must not exceed two pounds. (2 pounds = 0.909 kg), this will be checked every time before the sumo event, and the referee can ask the robot to be weighed at any time on a random basis.

The robot must have enough stamina to potentially race for 12 to 36 minutes without recharging.

The robot must be fully autonomous, i.e. the operation of the robot must not be affected by human intervention after the start of the program, and it must perform its task completely independently. During the competitions, at the request of the team, the referee or the assigned assistant can touch the robot. The competing team may only touch its robot during the active period of the competition when it receives permission from the referee.

Can be used with any number of NXT, EV3 or spike motors and sensors: light or color sensor; distance sensor (ultrasonic or infrared sensor), touch sensor, gyro sensor.

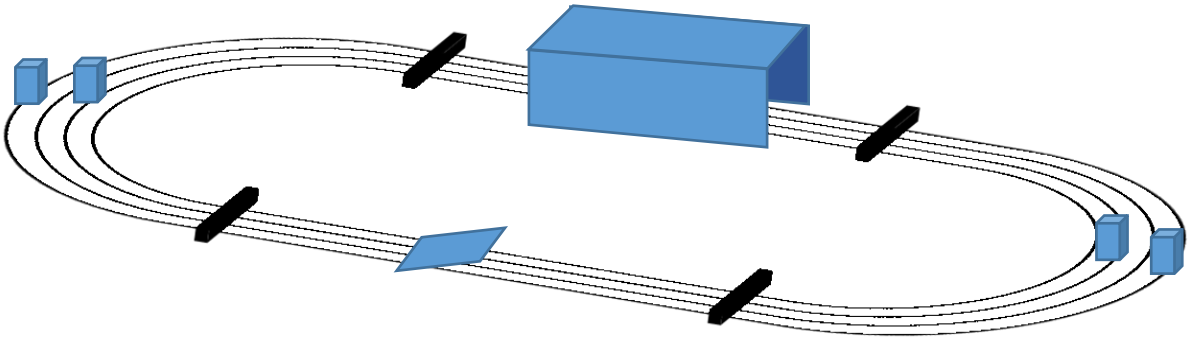
Each round will start at the same time, so it cannot happen that a team has to compete in two events at the same time. Turns will be indicated by audible signals.

Teams draw a number at the beginning of the competition. Throughout the competition, we will identify the teams and robots with this serial number, so the serial number must be clearly visible to the team members and the robot. In the competitions, the robot can only be started by one of the team members.

In the different events, the order of the teams is scheduled in advance. This is given to the teams at the beginning of the race, so they can follow the progress of the race. We will do everything we can to make the competition run as smoothly as possible. We ask the teams to study the competition schedule carefully, to show up for each event in a timely and identifiable way!

**There is no video referee at the event, the referee always decides based on the competition rules.**

# Steeplechase



This task involves following lines, crossing a seesaw and avoiding obstacles.

- On the course, you have to cross obstacles 1 cm high. The obstacle will occur several times on the course. Obstacles will be fixed on the course.
- Seesaws are 40 cm wide, 55 cm long, 6 cm high in the middle; white in colour and without a guideline. There is a longitudinal black line on the two edges of the seesaw. On the track, one or two seesaws will be placed on the straight section.
- The obstacles to be avoided are 12 cm wide, 16 cm high, and 7 cm thick.
- A tunnel 40 cm wide, 30 cm high and 50 cm long will also be placed on the track. It will be possible to follow a line in the tunnel.

Following a black line on the course without human intervention to get over obstacles placed on the course. Teams should pay attention to the changes in light conditions due to the tunnel.

If the robot loses its own guide line or follows the line in the opposite direction for some reason, it will be taken off by the race marshals. Until the end of the time limit (3 minutes), the robots can try to reach the finish line.

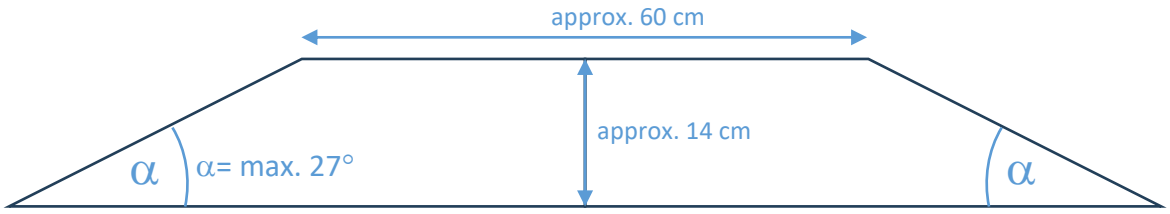
The robot should start with a 3-second delay after pushing the start buttom.

Each robot starts twice on the same track. The robot that completes the distance the fastest wins.

The parameters described in the general rules apply to the construction of the robot.

**A new obstacle!**

**A ramp will also be placed on the slope, the parameters of which are: ascent and descent of up to 27°. The ramp will be white in color and will have a black stripe in the middle, like on the base track. There may be a few millimeters of difference in the middle of the ramp due to the fitting, as you can see in the photo. The width of the ramp is 30 cm.**

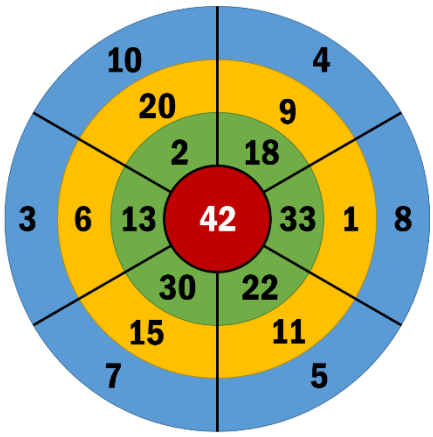



# Darts

The robot must throw balls into the target area on the field. The robot that can score exactly 141 points from fewer throws wins. A maximum of 8 balls are available for the robots to reach the goal. In the event of a tie, the teams play darts until the order can be clearly decided.

The darts field will be a board placed horizontally on the ground, into which the robots will throw ping-pong balls instead of darts arrows.

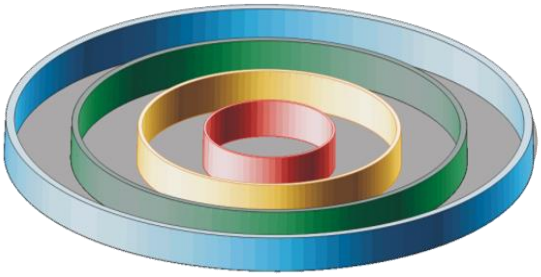
The points that can be reached are illustrated in the figure. The points rolled by the robot are continuously deducted from the initial 141 points until they reach exactly zero or all 8 balls have been thrown. If the team exceeds 141 points by throwing a ball, i.e. it would go negative after deductions, the value of the last ball thrown will not be deducted, if it has any remaining throwing opportunities, it can keep trying.



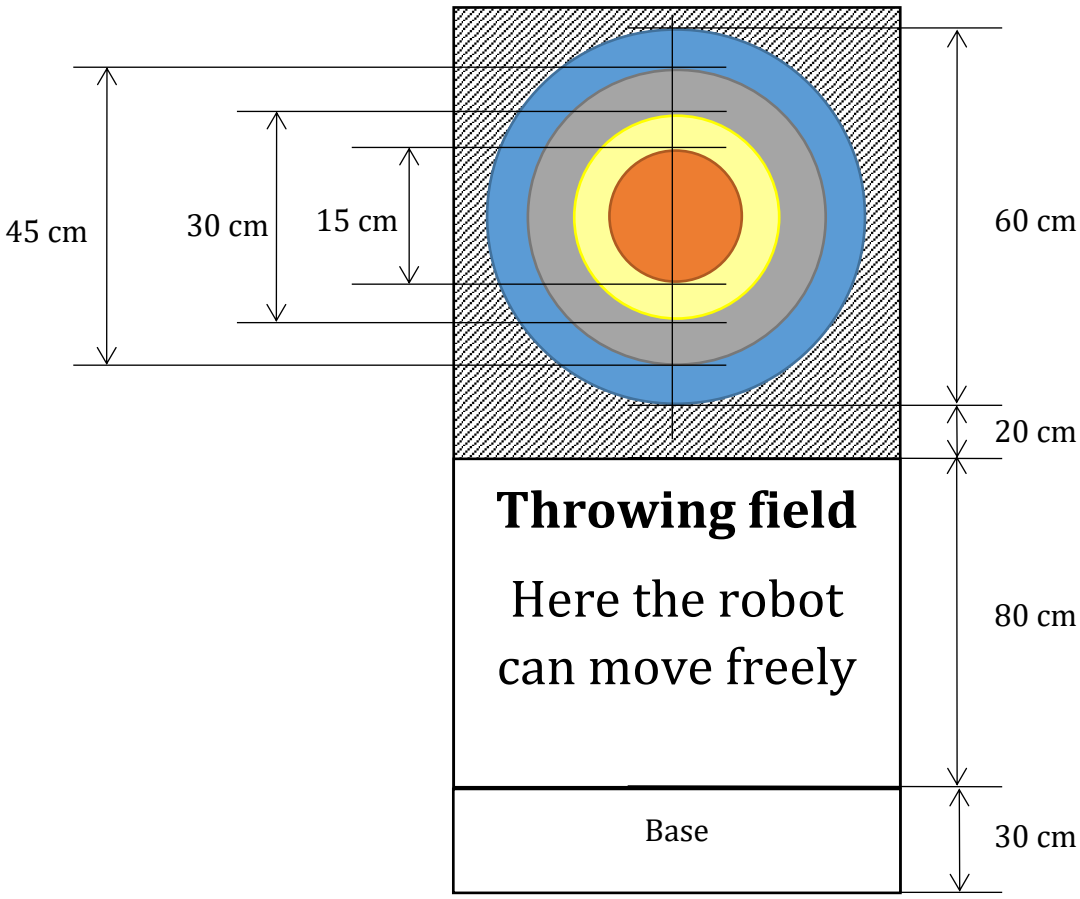

If the ball bounces off the court, the team receives the score from which the ball bounced.

The robot's program can only be started at the base in all cases. Between each roll, the team can only touch the robot at base. So, after each throw, the robot should come completely out of the throwing area to the base. During each throw, the robot must not stick out of the throwing area.

The target areas
Dividing wall
Height: 10 cm



Dimensions of the darts court:



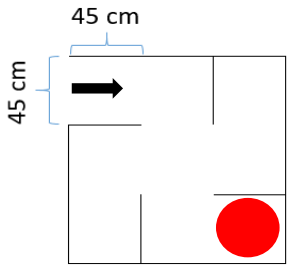
# Labyrinth

In the labyrinth, a red circle with a diameter of 30 cm is placed on the ground, and the robot has to find this mark.

The robot must be built in accordance with the general rules.

**The maze becomes fully known only after the robot is launched.**

All we know about the labyrinth track is that it is made up of 45x45 cm elements and the maximum wall height is 35 cm.

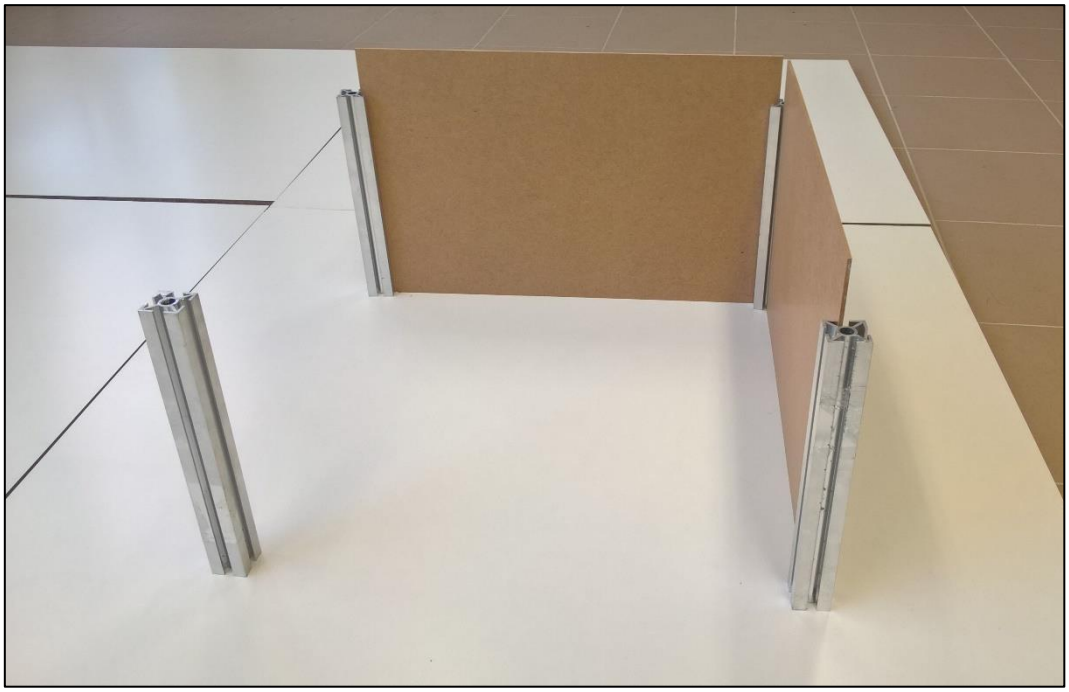



The winner of the competition is the team whose robot finds the red signal the fastest.

Inside the map, the team is not allowed to touch a robot. If the team deems it necessary, it can ask the referee to remove the robot from the track. Until the time limit (3 minutes) is reached, the robot can try to reach the finish line. During this time, the team can restart the bot from the Start box twice with any program. Scoring is based on the number of squares the robot reached on the shortest path to the finish and how long it takes.

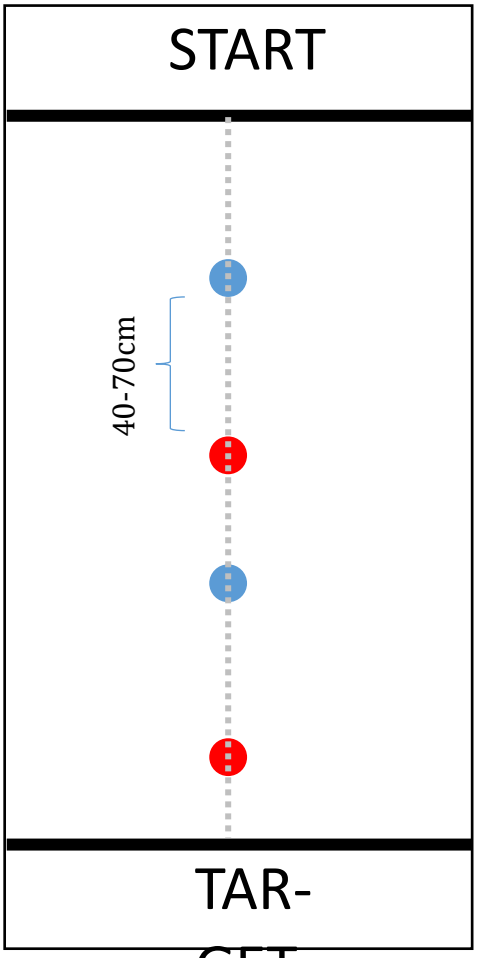
**It should be noted that due to the unevenness of the floor, a difference of a few millimeters (<4 mm) is possible at the junction of the furniture boards forming the base of the labyrinth. The baseboards are glued together with white insulating tape at their junction.**

The building blocks of the track:



# Slalom

The task is to go around the gates on the track in accordance with the slalom.




Both the beginning and the end of the level are marked by a black line. Due to the terrain of slalom, the plane of the track forms an angle between 0° and 25° to the ground, the start position is higher, while the finish is deeper. The steepness of the course may decrease towards the end. The width of the track is 120 cm, the minimum length is 250 cm.

The height of the gates (cylindrical columns) placed on the track is between 20 and 35 cm, and their width is about 710 cm.

The gates are located in a line in the middle of the slope and their distance varies: 40-70 cm. **The exact location of the obstacles will only be known before the race, and a draw will be held before the race to decide where the obstacles will be. A draw will also decide the color of the first obstacle.**

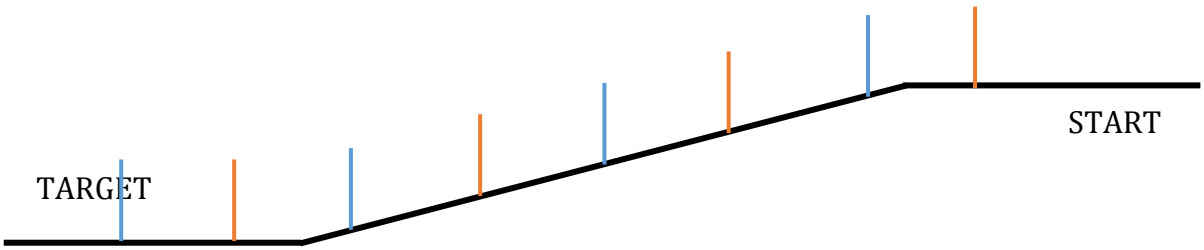
There are two types of colored gates in the slalom area, certainly in alternating color order. The colors of the obstacles have significance. The blue gate must be bypassed from the left according to the direction of the robot's travel, while the red gate must be bypassed from the right. The robot can touch these obstacles, but it cannot knock them over. In all cases, the robot must pass the gate on the side corresponding to the color. For each well-established gate, the robot receives a point, in case of a mistake, no points are awarded, knocking down an obstacle (including knocking down if the robot

pushes the obstacle from the signal point) is punishable with minus points. A gate can only be completed once in a round. The robot may not move up the track, in the direction of the start field, if it misses a gate, it must be registered as a wrecked gate until the end of the round.

The winner is the one who completes the most gates in the shortest time and the robot successfully arrives at the finish line.

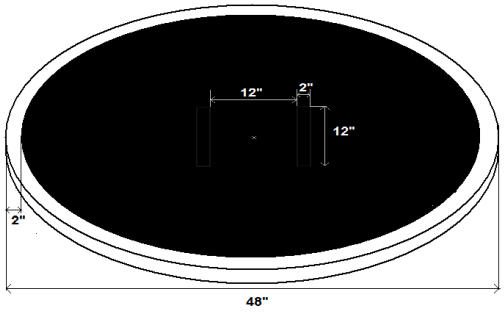
The team has the opportunity to try to complete the course twice.

**During the race, no points can be given to a robot that does not advance by avoiding obstacles in slalom. (It is not acceptable if the robot goes in a straight line next to the gate.)**



# Sumo

The robots fight according to the rules of robot sumo. A round ends when 3 minutes or 2 winning charges are reached.




**Arena**

The sumo arena is a total of 122 cm (4 feet) in diameter, painted in matte black, bounded by a 5 cm wide circular white ring. The surface of the fighting area is a smooth plywood plate and stands a few centimeters above the ground to make it easier for the judges to decide which robot left the fighting area first. A robot is considered to have fallen out of the arena if one of its parts touches the ground.

**The process of sumo**

At launch, the sumo robots are placed on the sumo arena at a distance of 30 cm from each other, at an equal distance from the center of the arena (about 15-15 cm from the center). The robots are positioned along a straight line, and each can go in the opposite direction to the other. Thus, the robots have to actively search for the opponent, and it is not possible to overwhelm the opponent right away.

The competition consists of several rounds. Each round is a maximum of three minutes and two winning runs. If there is no winner at the end of the three minutes, the round is a draw. Regardless of the time, the winner of the round is the robot that wins the most valid attacks. Two winning attacks mean victory for the robot, but they are required to play the third attack if they fit within the 3-minute time limit. An attack should not be longer than a minute. The winner of a round gets two points, the loser gets zero. If the result is a tie, each robot gets one point. If the robots collide during an attack or apparently fail to reach a decision, both contestants may accept the resumption of the attack. The robots can be restarted several times, but the round can last a total of three minutes. (In other words, the three-minute limit always exists, and the result of the round is determined by the

results of completed attacks, even if three completed attacks have not been completed during this time.)

At the beginning of an attack, the referee announces: three, two, one, GO! Players activate their robots and leave their half of the field, taking a seat in their designated area. The robots have to wait three seconds before they start any movement. During this time, the competitors leave the active zone. The first movement must be away from the center of the arena. If the front of the robot is not clear, the direction of the first movement will determine the front part of the robot in the future.

The robot must move forward, moving radially away from the center, until it leaves the starting area in its entirety, which is marked on the track in a way that is not perceptible to the robot, but clearly visible to the judges. After that, you can freely perform any movement.

If the robot wants to attack the other robot the first time, it cannot do so with its back. That is, the robot cannot leave the starting position and then immediately switch to reverse gear and attack the opponent in that way. To attack, you must first turn your face to him. If the robot attacks irregularly the first time, it loses the attack.

If a robot has already been attacked or has made an attack, it can then attack its opponent in any direction.

The robot must start moving forward within ten seconds of starting an attack, or it will lose the attack.

The fight of the robots, i.e. a charge, lasts until one of the units becomes immobile or leaves the fighting space. A robot can be identified as having left the arena if any of its parts touch the floor or its owner touches it on the battlefield. If a robot's body floats at the edge of the arena and does not touch the ground, it loses only after 10 seconds, if the other robot does not leave the field by then, if the other robot hits the ground during this time, the first, stuck robot wins. The robot that pushes its opponent out of the arena or paralyzes them wins, and if one robot commits suicide, the other robot wins. The judges' verdict is decisive in establishing both facts.

# Hajdúböszörmény

There are many great leisure activities available in Hajdúböszörmény. The renovated Bocskai Square, which forms the heart of the city, is one of them. During the reconstruction of the square, a pedestrian zone was created with walls reminiscent of the outlines of a medieval castle.

Its greatest decoration was the spectacle fountain, which was designed in such a way that you can cross a pedestrian bridge under a waterfall falling from a large chalice, which provides a great rest in the summer heat. The water games starting from four directions are very spectacular, and the overall picture can be enhanced by the underwater lighting in the evening and the music played several times a day. The water toy was programmed for various pieces of music during these periods, and thus it is a sight to behold and delight the ears.

The statue of Bocskai, which has stood on the main square since 1907, has been renewed, which is one of the symbols of the city. An vase was placed in the pedestal of the statue, which was restored for the first time since its erection, in which there are photos of the old and renewed square and the statue.

A real event space and community space has been created in the heart of the city, where it is good to go, take a walk and admire the renewed and newly built statues and buildings, meet and talk to people, listen to the splashing and music of the fountain.

The oldest public building in the county is the Hajdúság Museum. Within its walls, those interested can see the history of the Hajdús in the framework of a permanent exhibition. The exhibition presents the origins of the Hajdús and Böszörménys, the Hajdú district and the culture of the market towns. In 2014, the famous Böszörmény treasure collection came to the surface, which can also be seen in the Hajdúság Museum. In addition to the exhibitions, the museum also provides other programs for those interested. Visitors can get to know what the famous bell of Böszörmény is like, or what the outlaw world was like in Böszörmény, and visitors can also get an insight into the mysteries of snail spinning.

The peasant dwelling houses of the Hajdúböszörmény Country Houses, preserved in their more than 200-year-old original state, faithfully reflect the lifestyle and folk architecture of the time, which is a great excursion opportunity for those who love tradition. The Country Houses serve as the venue for several programs, such as the Peasant Olympics, where visitors can take part in a fun game as part of a program that revives the games of bygone times.

The Folk Hajdúház building is a typical Böszörmény-type Hajdúház, which stands out from the folk dwellings with its huge size, and also awaits visitors with a permanent exhibition, workshops, film screenings and a playhouse.

The recently renovated Fürdőkerti Ifjúsági Szállás offers great opportunities not only for those who want to relax, but also for those who would like to spend their free time with active recreation.

The 4.5-hectare wooded and grove area is one of the most suitable and ideal places to spend leisure activities. In addition to a variety of sports opportunities - such as football, basketball, volleyball, table tennis, table football, paintball, airsoft, field target, handicraft activities, and outdoor cooking facilities - are also available for visiting families. In the immediate vicinity there is the Palinta playground, where modern toys await both young and old.

In 2015, visitors are awaited with new entertainment opportunities, as the Spirit Leisure Center was opened in this year. There are four bowling alleys, two squash courts, three billiard tables, outdoor table football, a restaurant and a café.

In Bodasződ, which is part of Hajdúböszörmény, there is the remains of a church of medieval origin, which is surrounded by many legends. At the legendary Zelemér Truncated Tower, the staircase leading up to the mound was rebuilt, the area was landscaped and surrounded by a fence, resting and cooking areas were created, modern solar-powered candelabras were installed for night lighting, and a surveillance system was also established. The renewed environment provides hikers with the opportunity to cook outdoors and have a picnic, as well as to see forest animals. The surrounding area offers excellent opportunities for both cycling and hiking.

The defining value of tourism in Hajdúböszörmény is the Bocskai Medicinal Water. The qualification of the thermal water as medicinal water made it possible to establish a complex health and holiday centre in the green belt of the city. The composition of the medicinal water with iodide, bromide, fluoride and sodium chloride is excellent for the treatment of rheumatic, joint ailments, gynecological complaints and thyroid problems. In addition to the thermal pools of the Bocskai Bath and Spa with various adventure elements – neck shower, waist massage, jacuzzi – the sports pool with a stretched water surface offers the free world of swimming for young people, while the children's pools offer carefree relaxation for the youngest. The indoor thermal bath of the Bocskai Thermal Bath has been available to bathing guests since January 2007, and awaits those who wish to relax and heal on an area of about 1000 $m^2$.

# Accommodation options

## Fürdőkerti Ifjúsági Hostel

4220 Hajdúböszörmény, Vásár tér 3.

Tel.: 00-36-20-367-3339

Web page:
http://furdokert.hu/index.php/cimlap

## College Dormitory

DORMITORIES OF THE FACULTY OF CHILD EDUCATION AND SPECIAL EDUCATION

4220 Hajdúböszörmény,
Désány István utca 1–9

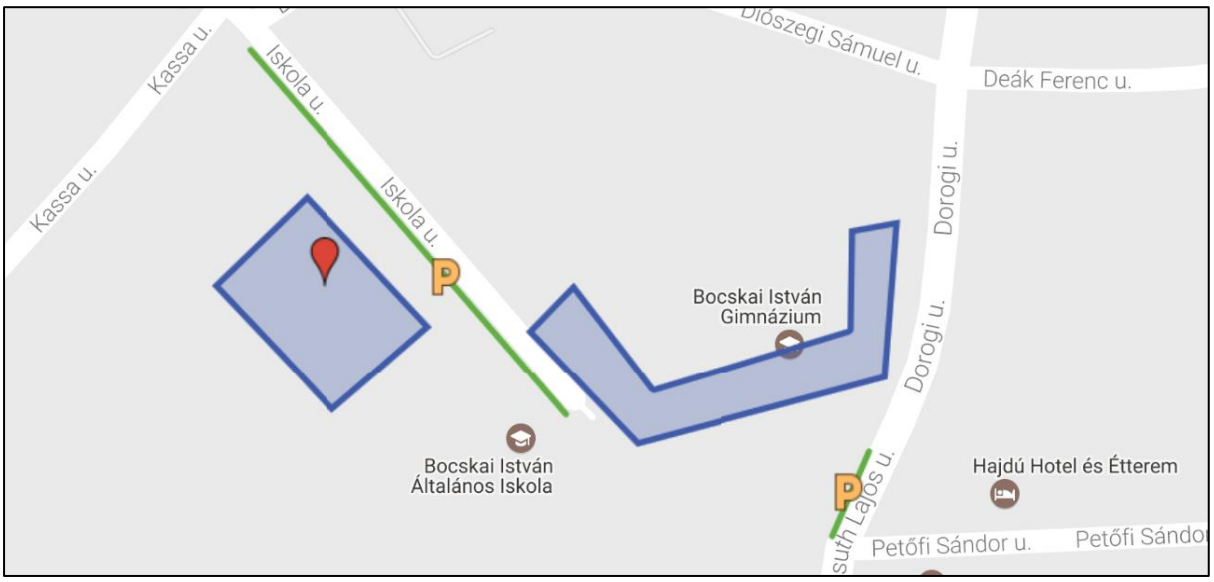
Tel.: 06 52 229-433/5252

**Mamre Hostel**
**Hajdúböszörmény**

4220 Hajdúböszörmény,
Káplár Miklós u. 2.

Phone Number: (30) 328 9307

# Parking




Parking is free!

**Good preparation,**

**We wish you a successful race!**

# ROBOTOLIMPIA 2025

## ÖTPRÓBA

## 2025. MÁJUS 31.
SZOMBAT

## 12. ÉV TAPASZTALATTAL
ALKALOMMAL

# GYERE EL

## ÉS TEDD PRÓBÁRA A ROBOTODAT!
## ÉS SZURKOLJUNK EGYÜTT A CSAPATOKNAK!

**HELYSZÍN: 4220 HAJDÚBÖSZÖRMÉNY, ISKOLA UTCA 4., SPORTCSARNOK.**
**GPS: 47.674041, 21.505852.**

További részletek:
www.bighb.hu
facebook.hu/robotparty

HAJDÚBÖSZÖRMÉNYI
TANKERÜLETI
KÖZPONT

Hajdúböszörmény
a hajdúk fővárosa

Terveink szerint idén, immár 12. alkalommal ismét megrendezzük Magyarország egyik legnagyobb robotika versenyét a **RobotOlimpiát**. Igazi Olimpiai hangulat és sok értékes nyeremény teszi feledhetetlenné ezt a rendezvényt.
Légy részese résztvevőként vagy szurkolóként a **RobotOlimpiának**!

400 éve a diákokért
HAJDÚBÖSZÖRMÉNYI
BOCSKAI ISTVÁN
GIMNÁZIUM

# Program plan

Foreseeable

## 31 May 2025 (Saturday)

| | |
|---|---|
| 800-1000 | Registration |
| 800-1015 | Testing |
| 1015-1030 | Opening |
| 1030-1400 | Heats |
| 1400-1445 | Semi finals |
| 1445-1545 | Finals |
| 1545-1615 | Announcement |

# Sponsors

We are constantly looking for sponsors of the event, so that we can ensure that the event is free of charge and that we can give gifts to students, preparatory teachers and award winners, as well as meals from this. Sponsors will be displayed on the event's website, on posters at the event and on other online, offline platforms.

You can read about support opportunities in detail on the event's website (http://bighb.hu/index.php/tamogatok).

**Thank you in advance for your support.**