THE WAVE EQUATION

Robotics Challenge Rules

WarHacks
IEEE Concordia
https://warhacks.ca

Introduction

The basic goal of the game is to navigate from one end of a line to the end, however there will be an obstacle along the line which your robot will have to avoid. Your robot will be scored based on the time it takes to reach the end of the line and the hardware that you are using. You will also be penalized if you have to interfere with the robot or it collides with an obstacles during the challenge.

The Board

The challenge area consists of a white board with 4 black lines running from the start zone to the finish zone. Each line is about 2cm thick. Obstacles of various shapes ($\approx 10 \times 10 \times 10$cm) will be placed on the paths. However if an obstacle is present on one path, it's neighboring paths will be clear. At the beginning of the each run, an official will randomly select one of the center two paths for your robot to start on.

Goal

Your robot will be placed in the starting zone at the base of one of the lines (robots will never start from outermost paths). The robot must then navigate autonomously, without colliding with any obstacles, to the end zone corresponding to the path from which they started.

Available Hardware

Each team will be given some basic materials to start their robot. The basic electronics (Arduino) and necessary additional components (batteries and cables) are provided. In addition, a basic wheelbase and tools are provided.

Teams will be able to purchase supplies with a budget of 100 ฿.

Items	Max Quantity	Price per Unit
Structural Material	-	5฿
Ultrasonic Sensor	2	20฿
Light Sensor	3	10฿
Motor and Wheel	4	20฿
Castor Wheel	2	5฿

Table 1: Purchasable Items

Points

Scoring will be done throughout the second half of the event. An official will supervise all scoring runs. During the scoring period, each team will be able to attempt the challenge as many times as they like (priority will be given to teams that have not attempted the challenge yet). During the scoring period, the top score for every team will be recorded (lower scores are discarded).

Scores S are calculated as follows:

$$S = 250 - (\text{Time}_s + \text{฿}_{\text{spent}})$$

A 10s penalty will be added for interring with the robot or for obstacles getting hit.

Once the scoring period has ended, the top 5 teams will have one try to set down their best time. The winner will be decided as the team with the shortest time.

We reserve the right to attribute point deductions if we judge that the robot is not following lines and or for unsportsmanlike like conduct