Wildlife Ambulance Challenge

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Disclaimer

It is your responsibility to read and understand this document on a regular basis because we may update it from time to time.

If you have questions, please contact our micro:bit Team at orcinfo@ieeeottawa.ca

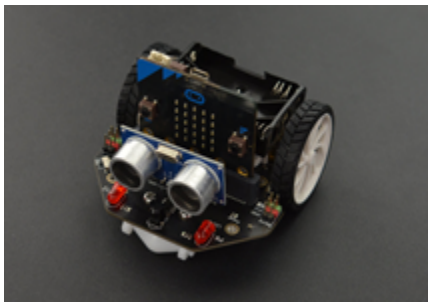
Wildlife Ambulance Challenge

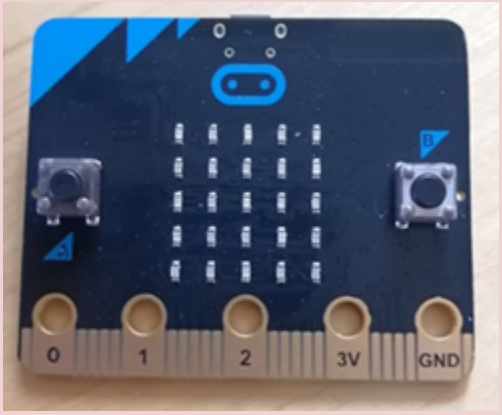
Climate change is affecting animals across the world. This year, animals from the Arctic, the Amazon rainforest and Australian wilderness are exposed to life threatening events. Your task is to use a micro:bit based animal ambulance to deliver these affected animals across some of the most dangerous terrains on the planet.

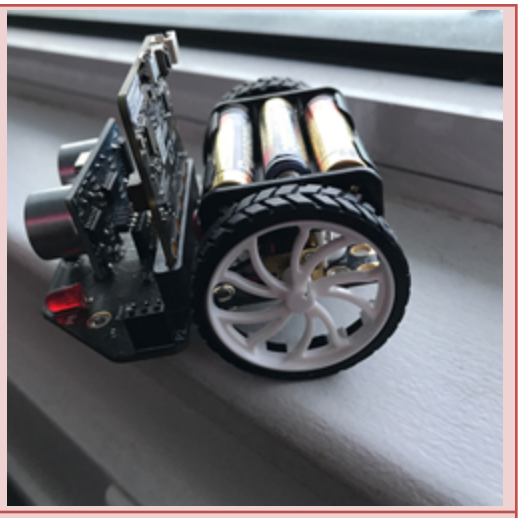
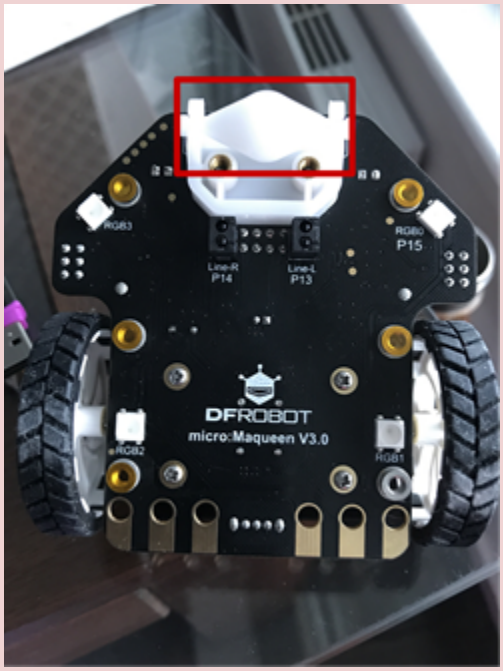
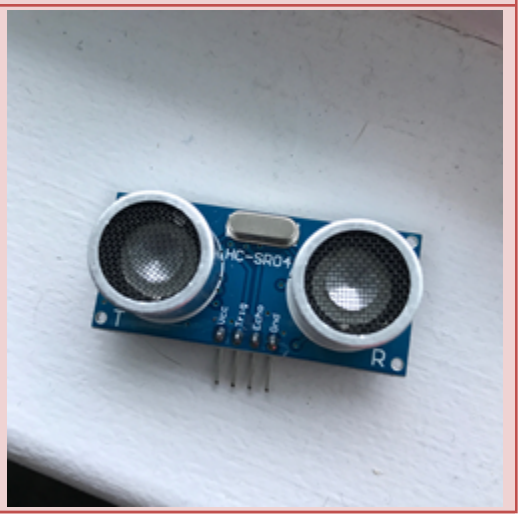
Your micro:bit will be tested on three terrains simulated using black electrical tape and obstacles.

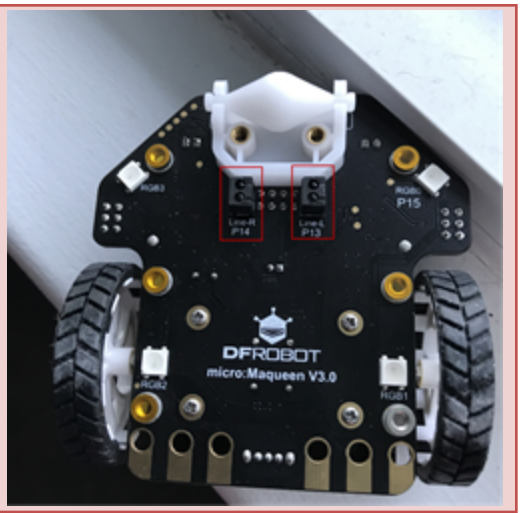
Approved Kit

For this challenge, we will be accepting the DFRobot Maqueen Kit and the InkSmith K8 Kit. Please note that the components that come with the kit are the only ones that will be accepted. This kit includes the following parts:



Part Type	Examples	Diagram
Hardware	micro:bit	

Movement	Wheels x(2)	
Movement	Roller x(1)	
Distance Detection	Ultrasonic Sensor	

Black/White Line Detection	Infrared Sensors	
Source of Luminescence	Various coloured LEDs	
Battery Pack and Batteries	3AAA	

Challenge Rules

1. All components of the robot must be from the kit.

2. Bluetooth commands are not permitted.

3. You will place your robot in the start box.

4. Timing of your attempt will start when the judge starts the robot.

5. There will be 3 tracks that your robot will go through. Each layout will have a different level of difficulty.

6. Your robot will have 3 attempts for each track and 2 minutes maximum to finish for each attempt. Your robot must follow the black lines and avoid obstacles that appear while going through the track.

7. The objective of the obstacle is so that the robot stops before hitting the obstacle for 3 seconds, which will then be removed and the robot is expected to continue to follow the track line. However, if the robot hits the obstacles, a time penalty will be given and the obstacle will be removed so that the robot can continue the track. A 15-second time penalty will be given.

8. If all wheels go past the track border for more than 10 seconds, the trial is finished and a maximum time (2 minutes) would be recorded for this try.

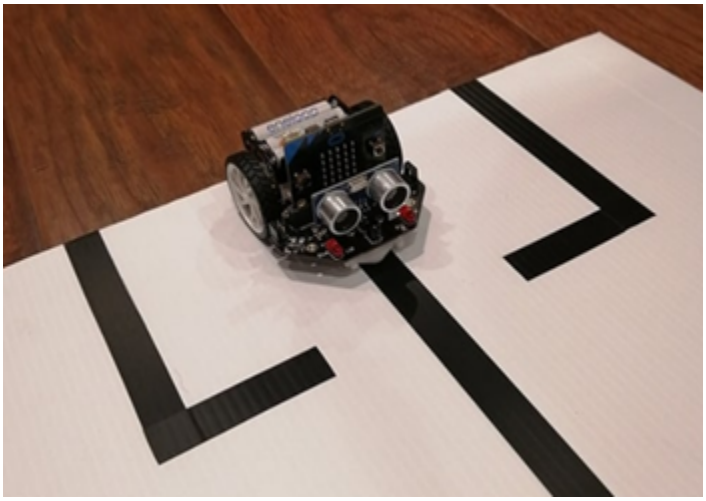
9. An obstacle wall will be placed at the end of the track, the robot must stop before hitting the wall.

Judging & Scoring

1. There will be 3 fixed tracks on the day of the competition.
2. Judges will time and score your match.
3. All robots have 2 minutes to complete each track. If the robot is unable to complete the track within this time, a time of 2 minutes will be recorded for that particular trial.
4. You will have 3 tries for each track and we will take the time of the best run. Note that if your robot spends more than 10 seconds away from the line or skips a significant portion of the track, that run will be awarded max time.
5. Each track will be scored out of 10:
    a. 1 point for leaving the initial box.
    b. 3 points for passing through the first obstacle.
    c. 3 points for finishing the track.
    d. 3 points for having the best time on a track.
6. Your code will be judged based on the concepts of good quality code. This includes visual organization of the code blocks, no code reuse, proper use of function/loops, proper naming of variables/functions, proper code comments. Judging will be performed in the coding blocks format. (10 points)
7. The One Page Report will also be worth 10 points.
8. The winner of the Challenge will be determined by the sum of all the points sections for a total of 50 points.
9. Decisions of the judges are final.

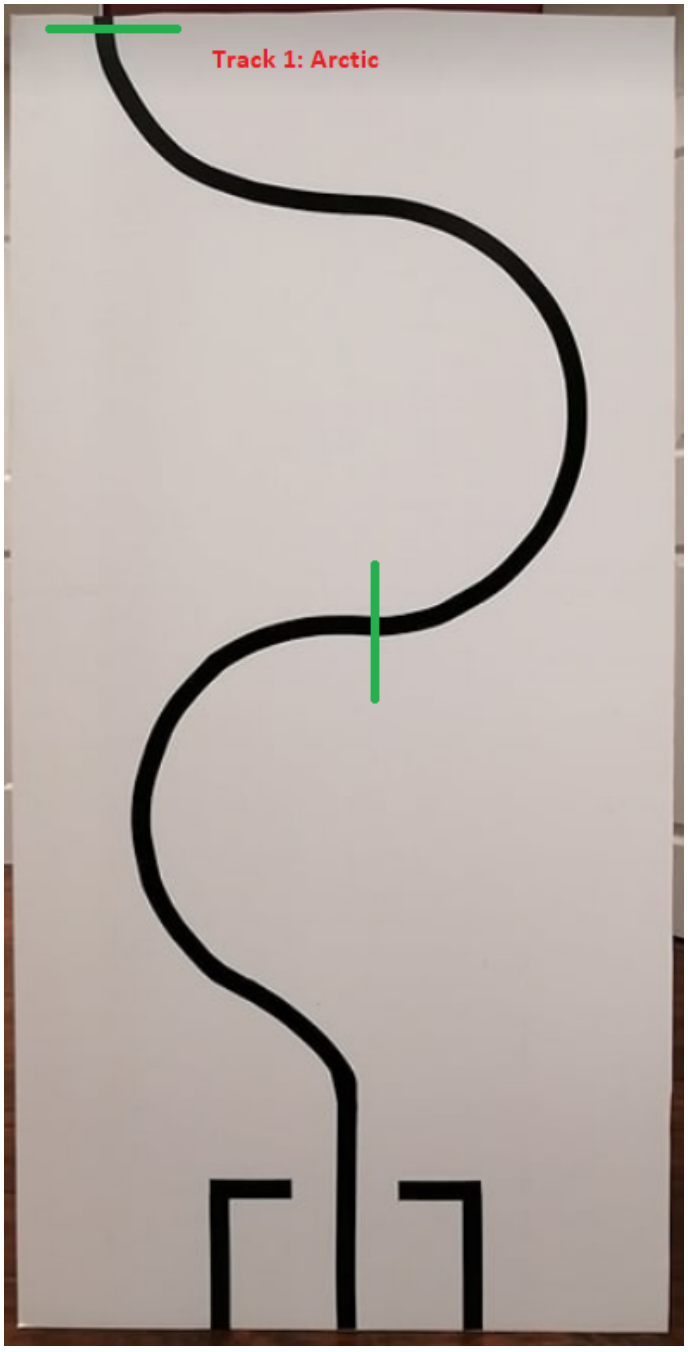
Animal Ambulance Challenge Starting Position

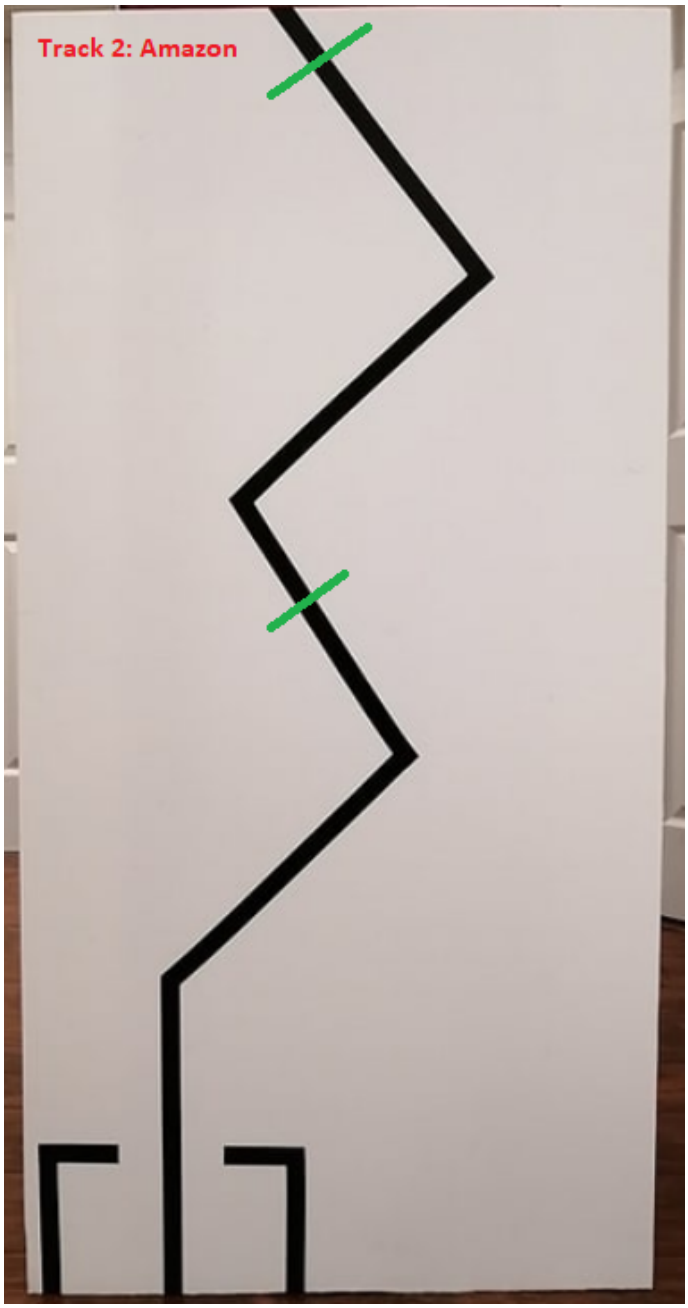
All robots will start in the start box. The dimension of the start box is 12cm x 20cm.

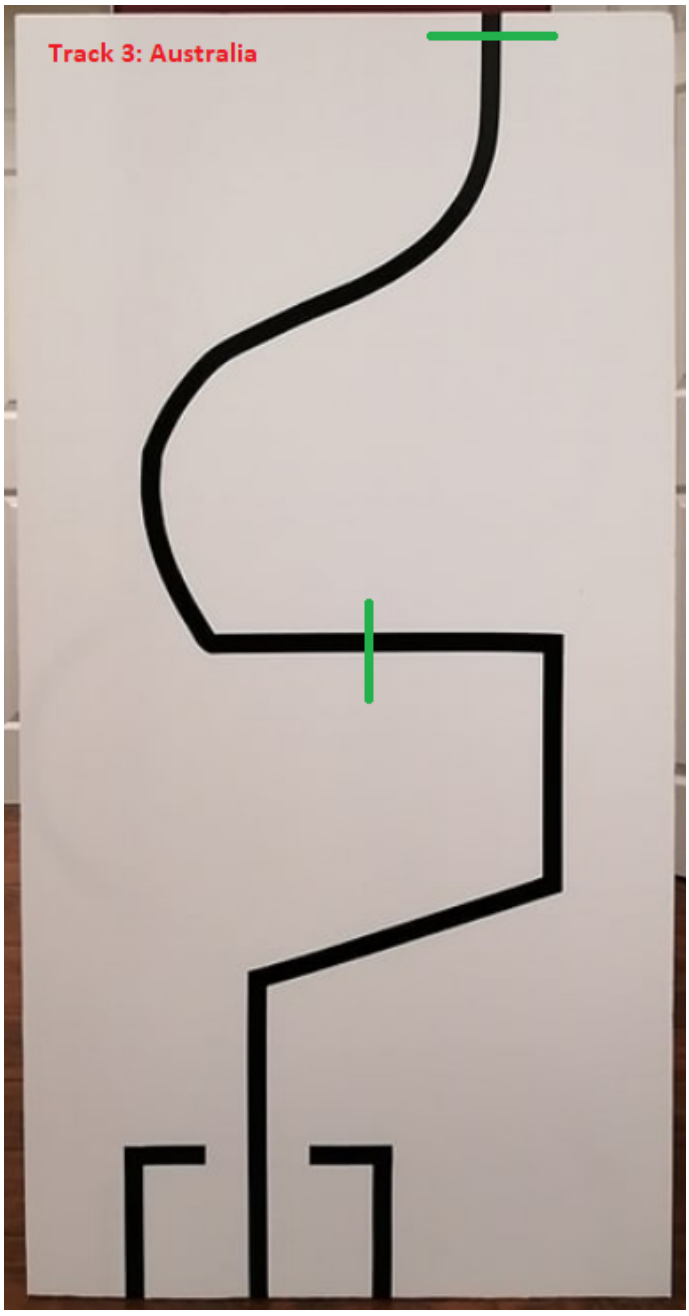


Animal Ambulance Challenge Diagram

The dimensions of each track area is 4’ by 2’. The track will be represented by black electrical tape (¾”). The green lines in the diagram are approximately where the wall obstacles will be placed. Obstacles will have an approximate size of 6” by 6”. Note that once a robot stops at an obstacle, the obstacle will be removed and the robot should continue to follow the track line.


Track 1: Arctic


Track 2: Amazon


Track 3: Australia