Final Challenge

Title: “Triathlon”

Difficulty level: high

Introduction

This is our final challenge; we have to train our robot to be able to complete a Triathlon!

Objective

The challenge consists in running on three different scenes as fast as possible: the beach, the mountain bike path, and the running route.

Description

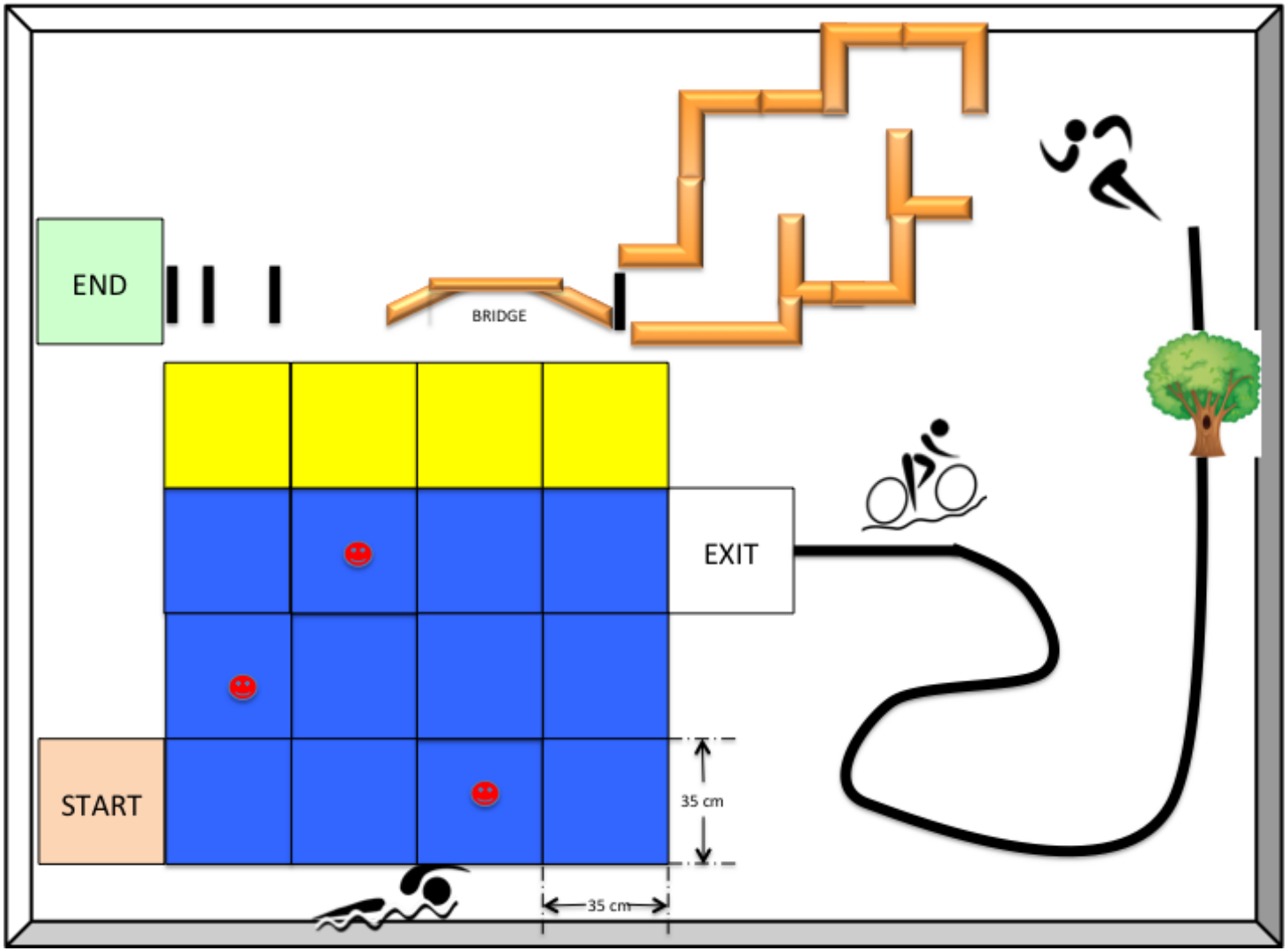
The robot has to complete the three races, in order:

1. At the beginning it has to swim in the beach (blue area) and rescue three child toys putting on the sand (yellow area).
2. The distance from the beach to the bicycle path is 25 cm. There, the robot has to follow the path avoiding some trees that it is going to find in the path.
3. At the end of the bicycle route the robot has to run into a maze. Before the robot reaches the finish line it has to ramp up a bridge and park in the parking area when it has crossed 3 lines.

The robot has to display what it is doing on the brick: “SWIMMING”, “CYCLING” or “RUNNING”. The message has to stay in the display from the beginning of the task until the end.

Every time the robot begins a phase, it says “Ready”, and when it reaches the finish line, it says “Bravo”.

Scene



Rules

1. The robot must start at the start point and finish at the end point.
2. The child toys have to be left completely inside the yellow area (the sand).
3. The robot cannot touch the trees.
4. You are allowed to modify the front side of the robot in order to improve the collecting or pushing toys in the beach. The maximum robot's length is **45 cm**.

Hints

- Ramping up: The robot would start up slowly and increase speed over time.

Competition

1. Each team has two attempts, and the best result is taken into account.
2. The winner is the faster robot, which completes the race.
3. In case of a tie:
    a. Every child toy rescued in the suitable area adds 1 point.
    b. Avoiding the trees without touching them adds 1 point.
    c. Parking in the right place, that is, after three lines adds 1 point.
    d. Every time the robot emits a correct sound adds 1 point.
    e. Displaying the right action: "SWIMMING", "CYCLING" or "RUNNING", 1 point for each.
4. During the competition you cannot make changes in the programme.

Student's report

Finally, you have to complete a report including:

1. Name of the team, names and nationality of the participants, name of the robot.
2. Short description of the challenge (about three lines).
3. Hardcopy of the implemented program.
4. Problems and solutions.
5. Photos and name/link for short video.