PREDESTINATION

ARC Competition for ATMOS 2018

Summary

- To use a wireless, manually controlled robot to reach the exit with the Time Stone by clearing its path by opening and closing gates by pressing relevant switches placed sporadically on the arena.
- Points awarded for exiting the Arena are inversely proportional to the time it takes for the team to exit the arena.
- The teams will be penalised for respawns.

Arena

The Arena will consist of:

- Switches randomly placed at fixed places on the arena.
    - Each switch will open/close some gate(s) and/or deactivate some gate(s). This behaviour and linking will be random and will ensure that no team can simply learn the best moves to get to the exit.
- A Green Tile with a ‘Time Stone’ on it.
    - The Time Stone can be picked up from its respective tile.
- The task of randomising the switches’ behaviour will be done automatically, programmatically. The organiser’s will have no direct participation in the process.

<need Arena’s schematic here>

This map is purely for representational purposes only. The number of switches, gates, and maze pattern is subject to change. The dimensions of the Competition Arena will be the same as illustrated here.

Robot Specifications

Technical Specifications

- Max Size: 300mm x 300mm x 300mm (l x b x h)
- Max Weight: 3kg
- Max Operating Voltage: 12V
- Power Supply Unit: Onboard battery (Li-Po, Li-Ion NiMH, NiCd, or Lead-acid)
- Wireless Communication: 2.4 GHz RF, WiFi, Bluetooth, NRF, or ZigBee can be used

Other Requirements

- Commercially available ready-made robots are not allowed.
- Each team is allowed to have only one robot.
- The robot must be controlled over wireless only.
- The robot must have no appendage for lifting or pushing the switches or the gates.
- The pickup mechanism can be any mechanical setup inside the specified dimensions.

Gameplay

- Each gate has four possible states:
    - Deactivated - The gate is deactivated and cannot be switched
    - Activated
        - Open
        - Closed
- Each switch can be activated by moving the robot over it.
- There are two types of switches:
    - Toggle - Toggles the gate (open/closed) linked to it
    - Push - Keeps gate open for the time it is pushed
- There will be two runs in one gameplay. One and only one gameplay is allowed. The end of a gameplay is marked by the robot exiting the arena.

First Run

- The robot will start from a ‘Start’ spawn-point.
- The robot must search for switches in the Arena, and is expected to find out switch parameters (toggle/push) and the switches’ links with gates by playing around with them. All pushes/toggles update on a screen maintained by the organisers.
- Whatever the robot actuates in the first run is stored by a computer (maintained by the organisers) and the behaviour is forwarded to the next run.

The end of the first run is marked by the robot stepping on a green tile and picking up the ‘Time Stone’. This creates a loop in time and the robot has to start from the ‘Start’ spawn point again.

Second Run

- Because of the Time Stone, the second run acts as an alternate timeline to the first run.
- In this run, the Time Stone must always be in the robot’s possession.
- If the Time Stone is dropped, the robot will have to be respawned again.
- All actuations stored in the first run will be directly replicated in the second run, as is.
- For example, if the robot steps on pushButton-1 (linked to gate-3) for 5 seconds, at 12 seconds into the first run, gate-3 will be automatically actuated for 5

seconds, at 12 seconds into the second run, irrespective of what the robot is doing in the second run.
- The team is expected to use their mental faculties to plan out their moves for both runs and find out how to reach the exit as fast as they can.

Each team gets a total of **two and only two runs for one gameplay and only one successful gameplay** to get as many points as they can.

Scoring System

<To be updated>

Rules and Guidelines

The organizers reserve the right to change any of the above said rules, at any time. Changes will be notified on the website and Facebook page. It is the participant's responsibility to stay updated.

Setup Time

- The participants will get 10 minutes of setup time for calibration and testing prior to the competition, according to a schedule that will be made available at the start of the event.
- Ensure that all of the vehicle's peripherals are working properly.
- The robot must be placed in the starting point on the Arena, at the beginning of each round.

Competition

- Participants will not be permitted to enter the Arena or touch any of the switches inside or outside the Arena, during, before, or after a match.
- A robot cannot have child robots.
- Any robot should not have any kind of weights to deploy on switches.
- The robots can come in contact with the walls but should not damage it.

- Participants should *not* dismantle their robots before the competition results are announced as the robots might need to be checked by the organizers at a later stage to ensure that the participants have not violated any of the rules.
- In case of any dispute, the verdict of the judges is final.

Disqualification

A team may be disqualified due to, but not limited to the following:

- The robot fails to meet any of the criteria in the robot Specifications section.
- The robot damages a switch when moving it, or a gate while moving past it.
- Colliding with a gate intentionally marks heavy penalisation, or immediate disqualification depending on the damage.
- The participating team is not ready in time for the start of their turn.
- The robot damages the Competition Arena.
- The participating team is found to be using a programmatic approach using an electronic device including, but not limited to, a smartphone or a computer, to find the best solution to a randomised arena map.

Participation

- Participants can register in teams of 1-4 people.
- Students from different educational institutes can form a team.
- All participants must have a valid ID card from their educational institute.

Contact