**Robotics – Exercise 4 – Red Team Report**

Shlomi Ben-Shushan ID: 311408264

Yiftach Neuman ID: 208305359

**Summery**

In this report we will explain our implementation of the Red Team, that helped us to test, improve and evaluate our blue team algorithm.

**Algorithm Description**

**General Strategy:**

Wander the arena by driving straight until you find food or bumped into something. If you find food, continue wandering in a similar way, but if you sense base's color, drive towards it. If you bumped into something, make a hard-turn. Although this is a simple strategy, it made good results and it is not completely naïve because of the base's color sensing.

**Sense:** in this section we will describe our usage in the robot's sensors.

1. **RGBA Cameras:** the forager uses the 5 not-rear RGBA cameras to sense colors
2. **Bumpers:** the forager uses the three bumpers in its from to sense collisions.

**Interpretation:** in this section we will describe the interpretation of the sensing data.

1. **Nest Ahead:** when the front RGBA camera senses team base's color.
2. **Nest to the Right:** when the right or the right-front RGBA cameras senses team base's color, and the nest is not ahead.
3. **Nest to the Left:** when the left or the left-front RGBA cameras senses team base's color, and the nest is not ahead.
4. **Bumped into something:** when one of the front bumpers is pressed.

**Action:** In this section we will describe each forager state we have defined, and the behavior of the robot (the actions it will take) in each of the state.

1. **Move:** drive straight until:
   1. Found food 🡪 Switch to **RTB** state.
   2. Bumped into something 🡪 make a random **turn** (only hard-turns supported).
2. **RTB:** drive straight until:
   1. Food dropped 🡪 Switch to **Move** state.
   2. Nest (or base) nearby **🡪** Drive towards it.
   3. Bumped into something 🡪 make a random **turn** (only hard-turn supported).
3. **Turn:** drive with angular speed only until:
   1. Turning timer 🡪 Switch to **RTB** state if holds food, and to **Move** otherwise.

**Setup() Pseudo-Code:** Register robot with writeTeamColor() function, define team, base, and opponent colors, w.r.t foragingMsg.outColor value, and start sand-timers.

**Loop() Pseudo-Code:** Read sensors, interpret sensing data, and behave according to the current state, as described above.

**Blue vs. Red Report**

The following table describes the results of various experiments we performed in which we let the Blue Team (original forager implementation) compete with the Red Team so that we can evaluate the Blue Team performance.

Table

Description automatically generated