ID2209 – Distributed Artificial Intelligence and Intelligent Agents

Assignment 1 – GAMA and Agents

Course Coordinator
Mihhail Matskin

Course Assistants
Mehdi Satei
Óttar Guðmundsson
Shatha Jaradat

Group 21
Khushdeep Singh Beant Singh Mann

Ketan Sunil Motlag

DATE.OF.ASSIGNMENT
14 Novemeber 2018

Introduction to Gama

In this assignment, we were tasked with creating festival scenario in GAMA, and implement different attributes depending on the behaviour of an agent. In this case we are tasked to create diffrent agents like shops, guests, security guard etc. Guest agents are wandering near festival area and they know the location of information center. In some time guests will go either hungry of thirsty and they will have to get the information about the location of food and drink agents. Also here will be some bad agents who get killed by the security.

How to run

Run GAMA 1.7 and import filename DAIIA_Group_21 as a new project. Press main to run the simulation. Note that changing parameters 1,2 and 3 will affect how A, B and C will work. Unzip DAIIA_Group_21.zip and import the resulting directory in GAMA 1.8 as a new project.

Navigate to creativity Model.gaml and press on the experiment button above (guests_assignment) to run a simulation of the basic assignment, of the challenges. There are many parameters that can be tweaked to modify the behaviour of the simulation, and that will be explained in the next sections. Some examples are the number of participants in the festival, the number of places that offer drinks and the number of those that offer food.

Species

Guest, Thirst Shop and Food Shop, Information Center and Police

The guest species is the participant in the festival who is wandering and depending on the thirst or hunger going to diffrent shop agents. There are different reflexes for this species such as going to diffrent target points and even turning into bad behaving agents after some time.

Thirst and food shop species are randomly generated location in the environment. The information center agent is having the information for the location of the shops and bad behaving agent.

The police agent will kill the bad behaving agent and its being informed by the information center about the bad behaving agent.

Implementation

We started developing with a single agent and testing the different probabilities for the conditions of thirst, hunger and turning into bad behaving agent. We implemented the single attribute which is replenished by the agent and implemented the same logic for other attributes in a similar fashion.

Results

We have successfully implemted the different attributes of the agents and shops which can be seen in the picture below. If the agent is thirsty or hungry it will change its color from green to blue and green to yellow respectively and after reaching the destination it will turn green again.

If the agent turns bad in mean time it will change its color to red while wandering and the the police in blueviolet color will chase the agent and will kill it. Figure 1 demonstrates the implementation of the entire idea.

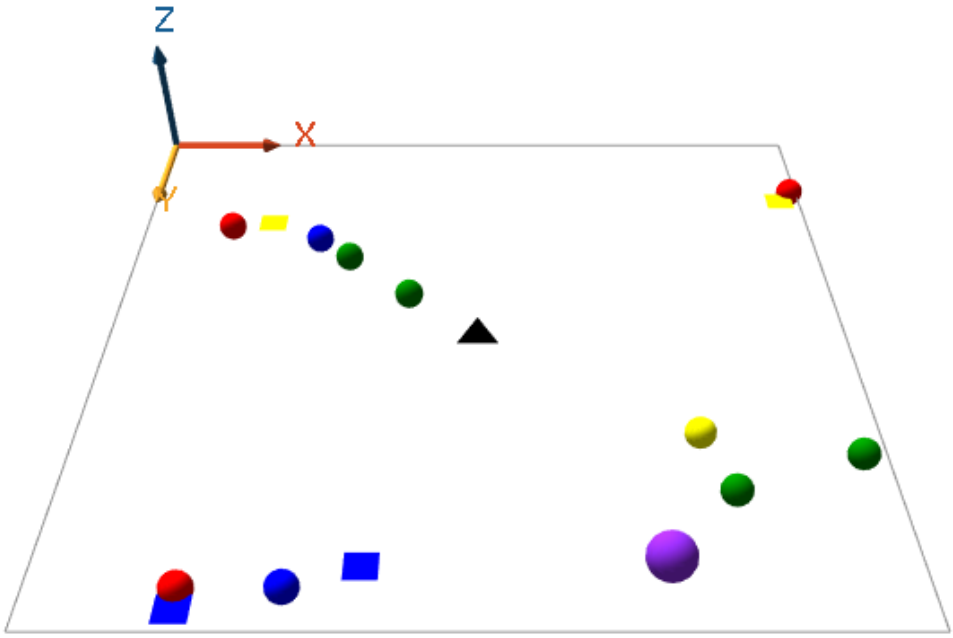

Figure 1: A screenshot of the final solution.

Challenge 1

We created 10 agents as a guest in the festival and defined two attributes Hunger and Thirst for them and similarly for 4 different shops we had two traits i.e. food and water.

Challenge 2

In challenge 2 we implemented temporary memory for each agent so that it has to remember the location of the food and water shop which it gained at information center. Also we implemeted the forget function in the program so after some time few agents will go to information center again for obtaining the information about the location of the shops.

Creative implementation

Initially we decided that the bad behaving agents will be having red color all the time. But bad agent will try to hide its identity by having normal colours when it is approaching and going away from the Information centre. So whenever the bad agent comes to the information center it changes its color (i.e pretending to be good eventhough its bad). Even in this scenario, information center is able to send the correct information to the police and then police is able to track and kill the agent who is trying to fool the information center.

Qualitative/Quantitative questions	*Answer*
Time spent on finding and developing the creative part	*We spent 2 hours on this part.*
In what area is your idea mostly related to…	*Related to bad behaving agents*
On the scale of 1-5, how much did the extra feature add to the assignment?	*4*
On the scale of 1-5, how much did you learn from implementing your feature?	*4*

Discussion / Conclusion

Since there was not an adequate material available on the basic programming concepts and sample examples, we struggled with the implementation part eventhough the logic was clear. But once we got familarize with the syntax we were able to code bit smoothly.

Creating basic conditions was no problem, but creativity part was time cons. The assignment was really nice and taught us about the basic structure of a program in GAMA and new syntax. Overall a good assignment, can‘t wait to create a new version when I get back home to show my friends and family!