ID2209 - Distributed Artificial Intelligence and Intelligent Agents

Assignment 1 - GAMA and agents

Group 12

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Festival simulation

In this assignment, we were tasked with creating a Festival simulation in GAMA, and implement the “go to drink or food stores” task when the agents got hungry or thirsty. They were dancing meanwhile. Some additional features were added then.

How to run

Run GAMA 1.8 and import ‘Basic Model.gaml’ as a new project. Press ‘BasicModel’ to run the simulation. Note that changing parameters ‘thirst_step’ and ‘hunger_step’ will affect when guests agents will get thirsty and hungry respectively.

Species:

- **Guests:** By default, they are wandering (dancing) using the **moving** skill. As time goes by, the possibility of going hungry or thirsty increases. When any of these flags is being activated, then the guest seeks food or drink. To do so, they first go to the information center, **ask** it for the locations of the stores, go to the store, and then keep dancing. They are assigned a blue colour if they are thirsty, red if hungry, and green otherwise.
- **Stores:** The stores are divided into drink or food stores. They get random fixed location in every simulation.
- **Information center:** The info CT is the only one that has an overview of what’s happening in the festival. They know the location of the stores, and so they can inform the guests.

Implementation

- We created a world with 10 guests, 3 drink stores, 2 food stores and 1 information center. We fixed the location of the information center in the centre of the world. By default, world’s dimensions are 100*100.

- The whole logic behind the code lies in boolean variables, let’s call them **flags**, where each one describes a specific **state** of each **agent** (e.g. if the agent is thirsty or hungry or not). They are set on true when a float variable (e.g. is_thirsty), which is being updated with a random step, surpasses a threshold.

- The rides of the agents are assigned by updating the target of the goto attribute of the moving skill based on the conditions.

- There is communication (ask statement) between guest and information center, where the first gets the location of shops from the latter.

Challenges Model:

Apart from the basic model, the challenges model had these characteristics:

1st Challenge:

- To achieve the first challenge we just created lists (memory) of the previous visited places of the guests. Thus, they first tried to retrieve the desired location into their or near-by guests’ memory list. If they couldn’t retrieve it, they asked info CT.

- One ask statement Only for the challenge part 1, between guest and guest, activated only when the first is on its way to the information center and finds the latter, which has previous knowledge of the location of the stores of interest for the first.

2nd Challenge:

- To achieve the second challenge we created another one specie: security guys and another boolean flag: crazy, which only set to true after some time. This flag, marked crazy guests' location, which was only known to near-by guests. It also enabled the near-by guests to confess by going to the infoCT ask it about a security's location, go there, and then escort him to the crazy agent. There is a mutual communication (ask) between betrayers and security guys. When securities are close to the crazy ones, the latter die.
- Communications for the challenge part 2:
  - There is an ask statement between guest and security guard, for those cases when some agent gets crazy and must "die".
  - There is an ask statement between guest and guest, running continuously, which makes the first be able to detect whether the latter has gone "crazy" and must "die".
  - There is an ask statement between guest and information center, in order for the first to get the position of a security guard from the latter.
  - An ask statement between security guard and guest, in order for the first make the latter realize it has to die.

Creative Model:

We also added a dance stage with DJ so that the agents dance close to this area, to make it look more realistic. Every time a guest performs a task, he returns back to the stage area and starts dancing.

Qualitative / Quantitative questions	**Answer**
Time spent on finding and developing the creative part	5 hours
In what area is your idea mostly related to…	How a proper party should look like
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 / Conclusions:

There is a clear distinction between using gama platform or other code languages. We experienced that gama platform is much more convenient to code agents where each one interacts with other, but has to take his own decisions. It was made obvious that for the smooth run of the model, one must clarify the priorities over different attributes or even agents of the problem, and also the communication base under which the agents interact.