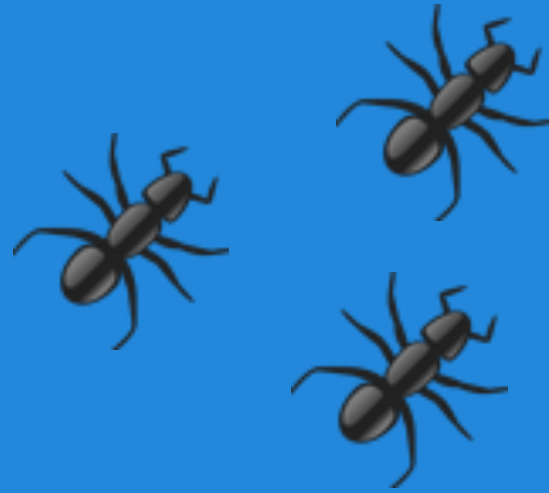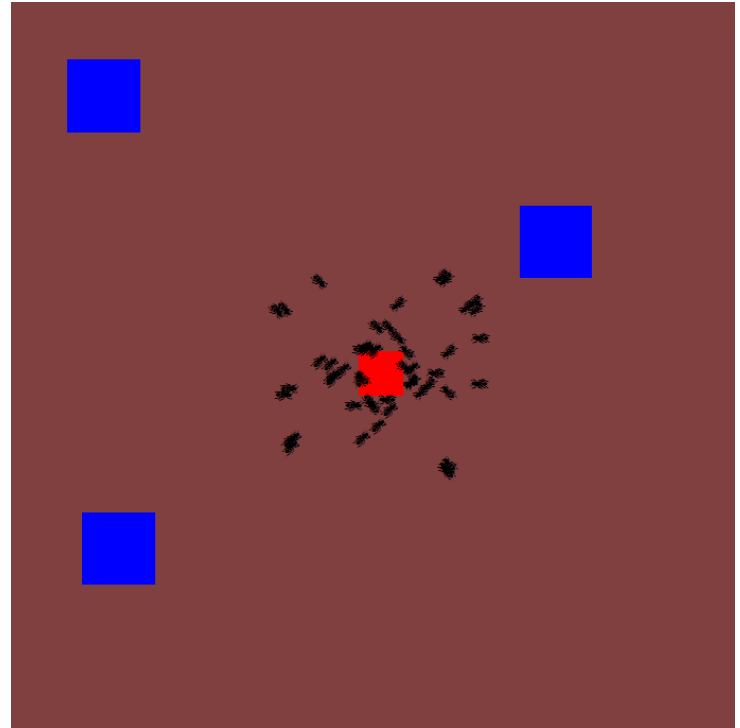# ANTS

Fesseha Belay
Javier Morata

What is it?

- The Model is the simulation of ants and their behaviour

- How ants move away from their nest in search for food and come back with food.

- They make indirect communication by secreting a chemical called Pheromone.
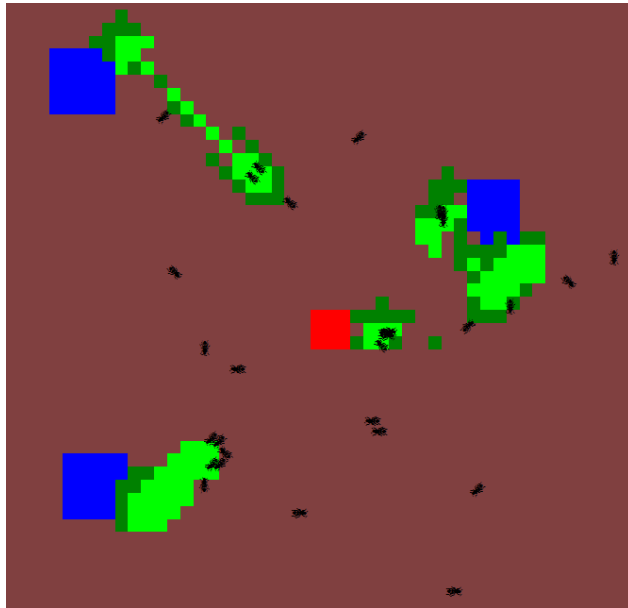
How it works?

- Initial State

- Goal: Bring the food to the nest

Scenario

Cellular Space

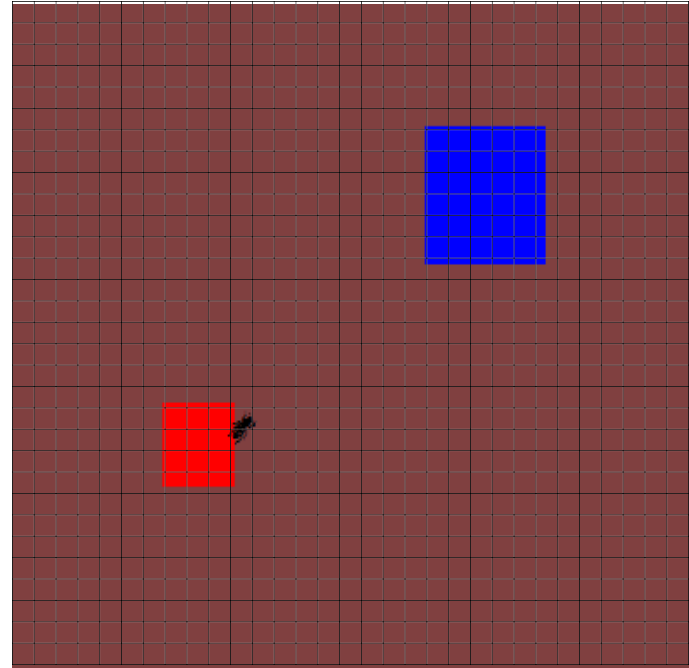
Cell State

- ⬛ Soil
- 🟦 Food
- 🟥 Nest
- 🟩 Strong Chemical
- 🟩 Weak Chemical

Ants movement

1. Starting from nest.

2. Choose a cell randomly on the CellularSpace.

3. Calculate the route from the ant to the cell destination.

4. Ants go through the route until the destination cell.
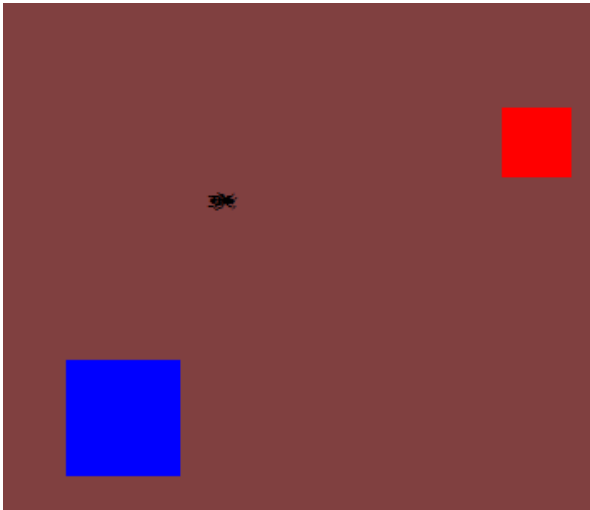
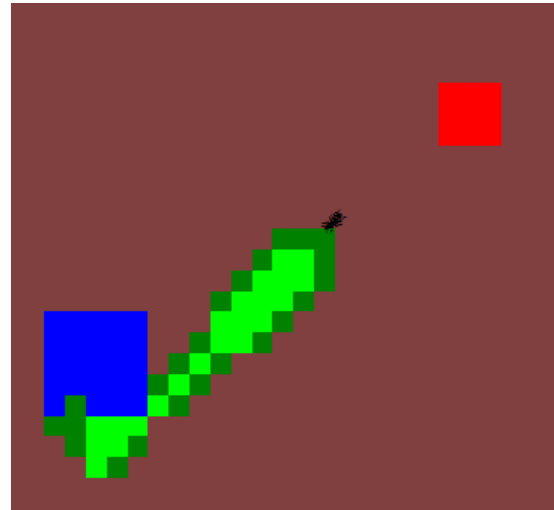5. Repeat step 2.

Ants behavior (I)

2 Possible states

Searching for food

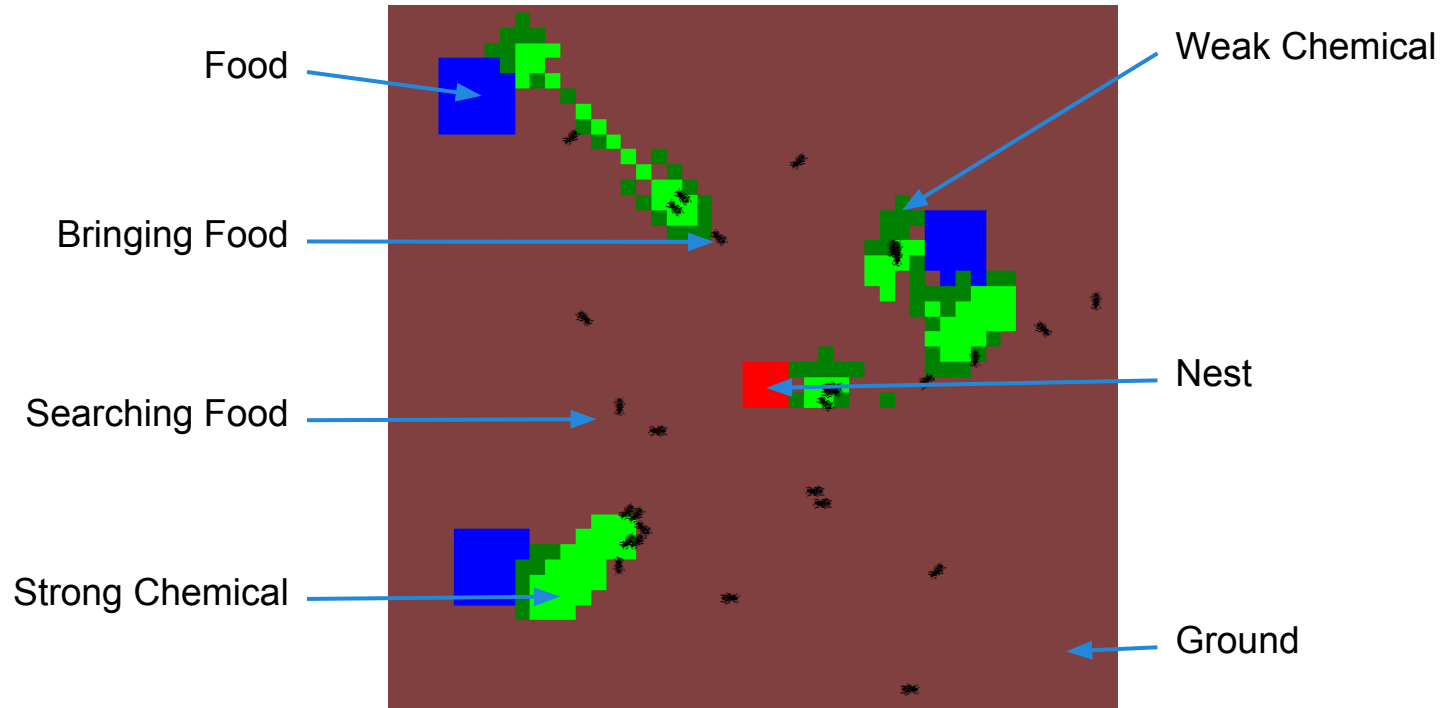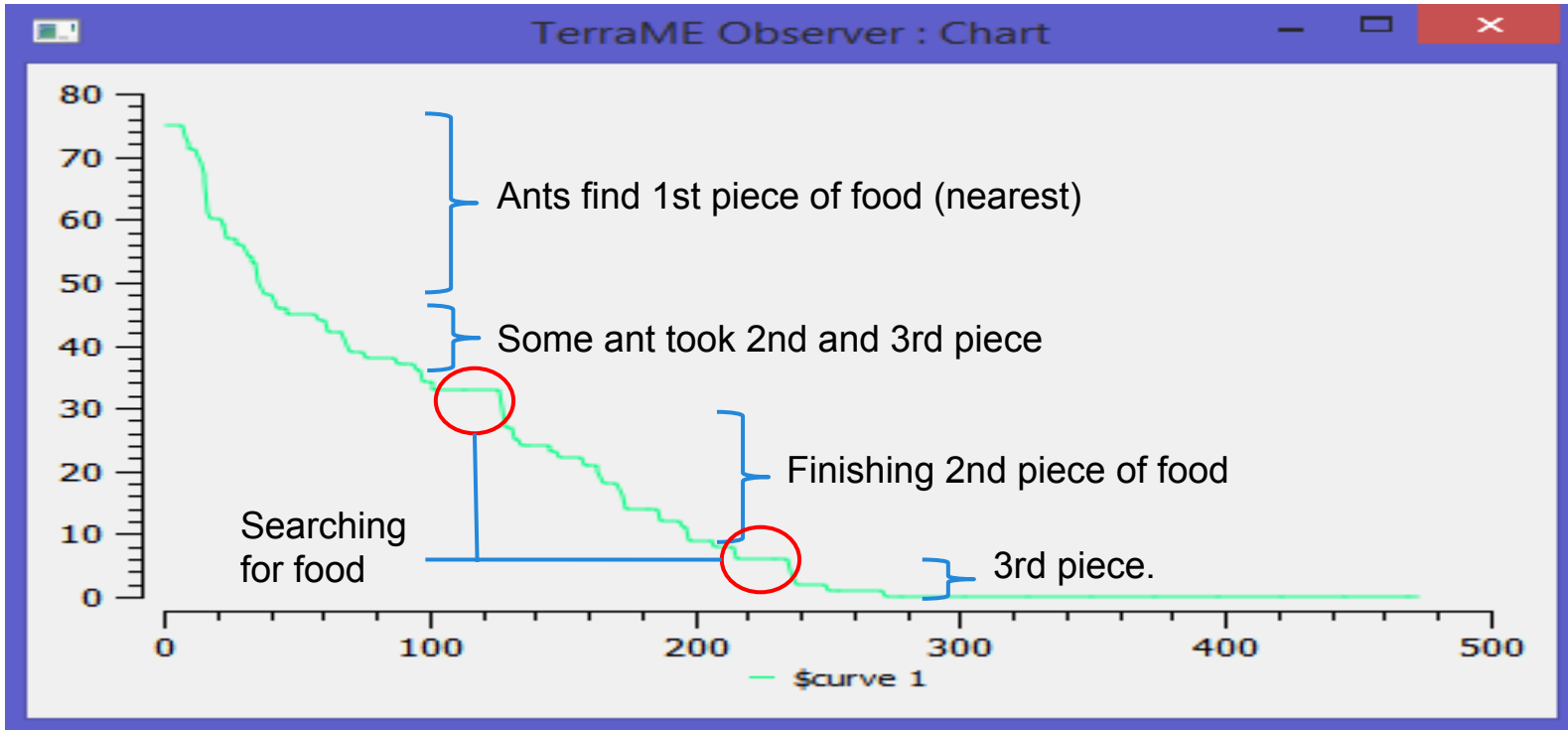### Bringing food

Ants behavior (II)

- Ant find food (⬛):
  - Change state to BRINGING FOOD and go straight to the nest dropping chemical.

- Ant find chemical (🟩):
  - Search for food, or move between chemicals.

- Ant find less chemical (⬛):
  - Search for food, or move between chemicals.

- Ant state is bringing food and find nest (🟥):
  - Drop food and change state to SEARCHING FOOD.

Example

Graph consumption

TerraME Observer : Chart

Ants find 1st piece of food (nearest)

Some ant took 2nd and 3rd piece

Finishing 2nd piece of food

Searching for food

3rd piece.

— $curve 1

Demo

Conclusions

- The behaviour is useful in research areas of swarm robotics and computational Intelligence.

- Ants may find food either near or far of the nest. The food which is near to the nest is taken faster.

- The consumption graph develops a steep gradient when the ant finds food and remains horizontal otherwise.

- The bigger the amount of food, it will take less time to take most of it and Viceversa.

Questions?

Thanks