ABM – Week 6 – Seminar – LVL3

Purpose

This task will allow you to explore the concepts of agent interaction and agent memory. You will write code to detect agent interactions, use lists to represent agents' memory of these interactions, and allow agents to change their strategy based on their memory.

Model

Open the model Ringroad.nlogo. This model represents cars driving around a closed circuit of road in both directions.

Look at the code and think about the following things:

- How does the model differentiate road patches and non-road patches?

- The choose-direction procedure allows turtles to follow the road.

    a) Why is "neighbors4" used rather than "neighbors"?
    b) What is the purpose of the code "in-cone 1 300"?

Task

Give the agents a variable defining whether they drive on the left or the right (their 'driving side'. If two agents who have chosen different driving sides meet, while travelling in opposite directions, they should 'crash' (but in this simulation, they should continue their journey); e.g. a "left" driver meeting a "right" driver will 'crash'.

Add to the code to detect such 'crashes'. Give the agents a memory of the driving sides of all agents they have encountered. Allow agents to adapt their own driving side based on this memory. Plot a graph of the proportion of agents using each driving side over time.

Include multiple different possible adaptation procedures:

- Adaptation using the whole history of interactions;
- Adaptation using only the *n* most recent interactions;
- Adaptation using only the most recent interaction;
- Adaptation only with a certain probability.

Hint: Use lists to represent agent memory.

Extensions

- Give the agents a memory of the agents who have crashed into them. Get them to shout an insult (i.e. print to the screen), whenever they encounter an agent that has crashed into them in the past.
- Add road sections leading to the outside world and allow new vehicles to enter and leave the world via these roads.