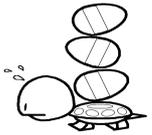


{ Alife Mutants Hackingsession on Systems and Organisms, Bielefeld 2004 }

Starlogo

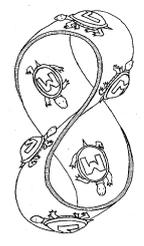
An introduction

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- The StarLogo interface
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History

StarLogo is the offspring of Logo, a programming language for kids with which one can create drawings and animations by giving commands to a graphic "turtle" on the computer screen.

History

StarLogo extends this idea by allowing one to control thousands of graphic turtles in parallel. In addition, the environment is also programmable.

So it is the perfect modeling environment for exploring the behaviors of decentralized systems. (i.e. bird flocks, traffic jams, and ant colonies)

Programmable objects in Starlogo

Turtles

The main inhabitants of the StarLogo world are graphic creatures known as "turtles."

Turtles can represent almost any type of object:

e.g. an ant in a colony
 a car in a traffic jam
 an antibody in an immune system,
 a molecule in a gas.

Programmable objects in Starlogo

Turtles

Properties of a turtle:

- position,
- heading
- color
- a "pen" for drawing

More specialized traits and properties can be added.

{ Programmable objects in Starlogo }

Patches ■

Patches are pieces of the world in the turtles live in. They are not merely passive objects, but can execute StarLogo commands, and they can act on nearby turtles and patches.

Patches are arranged in a grid, similar to cellular automata.

So StarLogo is somewhat like a cellular-automata world with turtles roaming around on top.

{ Programmable objects in Starlogo }

The observer

The observer "looks down" on the turtles and patches from a birds-eye perspective. It can create new turtles, and it can monitor the activity of the existing turtles and patches.

{ The StarLogo interface }

Graphics Window

This window shows the action of the turtles. (i.e. move and draw)

The turtles move on top of a grid of patches which is a torus .

You can move a turtle directly by dragging it with the mouse.

{ The StarLogo interface }

Interface Window

This window contains buttons, sliders, and monitors that allow you to interact directly with StarLogo programs. To create and inspect interface objects, use the Main Toolbar.

{ The StarLogo interface }

Command Center

This is where you type commands for StarLogo. You may run a command again by moving the cursor to that line and pressing return.

Procedures Window

In this window you write procedures for the turtles, patches, and observer.

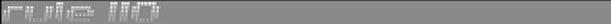
{ The StarLogo interface }

Main Toolbar

The Toolbar can be used to create interface objects (like buttons, sliders, and monitors).

To create a new interface object, choose the appropriate tool from the Toolbar and drag out a rectangle in the Interface window.

To inspect the underlying behavior of an existing interface object, choose the appropriate tool from the Toolbar then click on the object. (You can also inspect an object by shift double-clicking on the object with the standard arrow tool.)



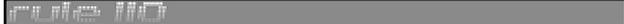
{ **The StarLogo interface** }

Plotting Window

This window (initially hidden) is where you can create real-time graphs, as your StarLogo project is running.

Turtle Monitors

If you double-click on a turtle in the Graphics Window, a Turtle Monitor will appear, showing the turtle's state variables (and their values). The values update in real time as your StarLogo project is running. You can also use the Turtle Monitor to directly change the value of a variable.



{ **First steps : a biological rhythm simulation** }

Idea:
Turtles move around in the environment.

In Caves in which it is dark they fall asleep but don't wake up again.

→ if turtles accidentally run into a cave they'll stay there forever, because they don't wake up.



{ **First steps : a biological rhythm simulation** }

→ Introduction of a day and night rhythm – when it is day the turtle runs around – when it is night it tries to get in a cave to sleep. But when it gets into a cave at daytime it can leave it again.