E-Portfolio

Multiagent Systems and NetLogo

Multiagent Systems

What are Multiagent systems

- Consisting of mulitiple units
- No central Control unit
- Every agent follows own targets
- Relatively simple targets for every agents can lead to very complex Systems

What are Multiagent systems used for

- They are common in real life
- Can be used for simulations
- Can be used as approach for dynamic infrastructure
    - Example: the Internet

Pros and cons

By following its own relatively simple Targets while communicating with other agents, a multiagent system can get very complex

+ Simple

It doesn't have to contain any very powerful agent so it isn't fatal when a single agent drops out

+ Fail safe

It can be expanded very easily by adding more agents (depends on the system)

+ Modular

No central control unit checks the optimal usage of all resources at once and monitors it as a whole

- inefficient

NetLogo

- Multi-Agent modelling environment
- Open Source
- Available as App or via Web-Interface

The World

- Rectangular world
    - Consisting of fixed agents "patches"
- Mobile agents called "Turtles"
- Communication between Turtles via "Links"
- External control via "Observer"

NetLogo (Language)

Command	Explanation
create-turtles number create-<breeds> number	Creates the defined number of turtles, they will all look in random directions
forward number backward number	Let the selected turtles make number steps for- or backwards
left number right number	Let the addressed Turtle turn number degrees left or right
pen-down pen-erase pen-up	Defines if the Turtles shall draw a line (in their color) erase other lines or shall do neither
die	The turtle will be deleted
ask *agent* [*commands*]	Selects all agents (turtles, patches, etc.) and let them execute the commands in the brackets
breed [plural singular]	Defines groups of turtles
to functionName … end	Declares a funktion
Let x 20 Set x x+1	Declares a variable Increases a variable

Further Information

User guide/tutorial, provided by the developer:

https://ccl.northwestern.edu/netlogo/docs/tutorial1.html

Dictionary with full command list

https://ccl.northwestern.edu/netlogo/docs/dictionary.html#