Instructions to use the simulator

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1 Compilation of the simulator

The compilation was tested under Linux Ubuntu (64-bit):

1. **Get all necessary packages**
   sudo apt-get install git
   (optional for downloading the simulator from github)
   sudo apt-get install cmake
   sudo apt-get install build-essential
   sudo apt-get install xorg-dev
   sudo apt-get install freeglut3-dev
2. **Unzip the simulator or clone from github**
   git clone http://github.com/Jonathan-Schwarz/neural_networks
3. **Go to neural_networks/new_graphic/**
4. **make**
5. **./new_graphic**

For compilation on other Linux systems equivalent packages as listed in Nr. 1 one have to be installed.

2 Using the simulator

In this chapter the functions of the simulator are described. As follows a figure of the simulation in progress:

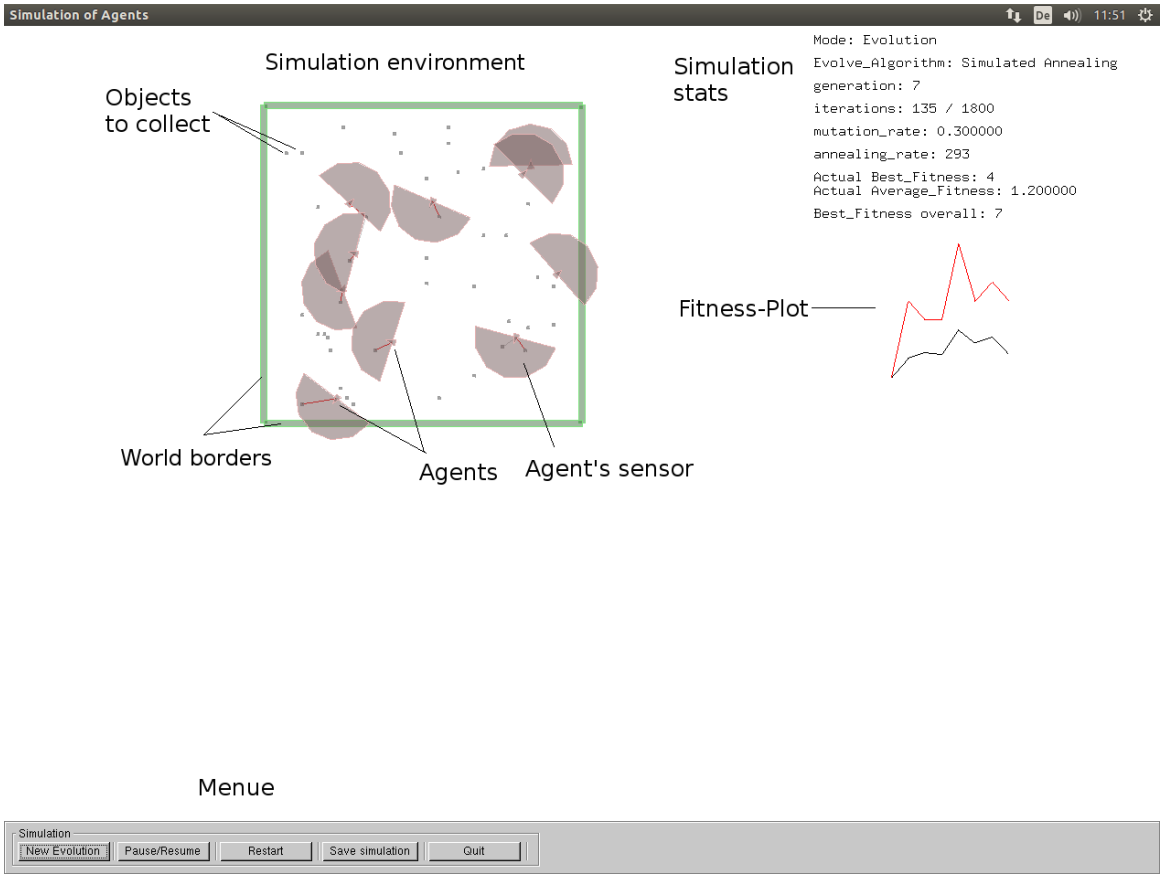

Figure 2.1: The simulator

The simulator has three parts: the menue, the simulation environment and the stats.

2.1 The menue

On the bottom side there is the menue. As follows the description of the buttons:

New evolution

Opens a window to choose parameters and start the simulation:

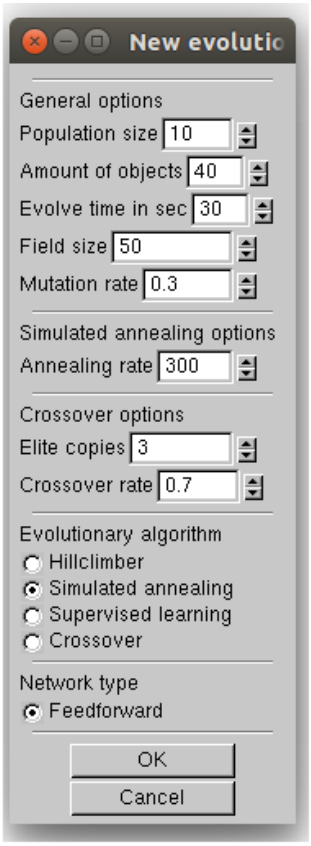

Figure 2.2: Create a new simulation

The 'new evolution'-window lets you choose the simulation parameters and the desired algorithm. After pressing 'OK' the simulation will begin instantly

Pause/Resume

Pausing/Resuming the simulation

Restart

Restarts the complete simulation process with the choosen parameters

Save simulation

Saves the actual state of the simulation; including parameters, stats and the weights and fitness of each agent in the 'simulation.txt'-file in the programs folder

Quit

Quit the program

2.2 Interacting with the simulation environment

The simulation environment is displayed in the middle of the window. To interact with the simulator some specified keys and the mouse can be used. To use them the focus has to be on the simulation environment. Therefore it has to be clicked on the simulation area. As follows the mouse- and key-interactions are described:

Holding left mouse-button

Click with the left mouse-button on an object or agent, hold it and move the cursor to move it:

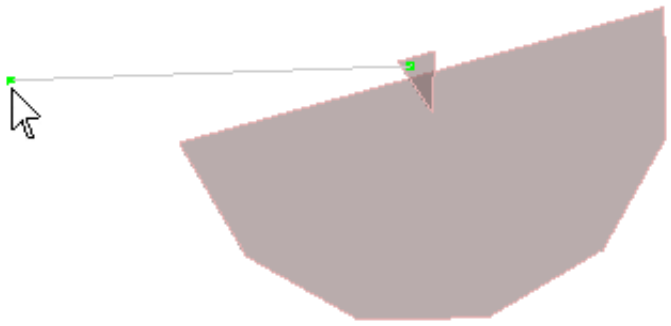

Figure 2.3: Moving an agent

Holding right mouse-button

Scrolling through the world

'x'- and 'y'-key

Zooming in/out

'p'-key

Pausing/Resuming the simulation

't'-key
Turbo-mode is enabled/disabled. In turbo-mode only the stats are updated. The display of the simulation will be frozen as long as the turbo-mode is enabled
'ESC'
Quit the program

2.3 The stats

On the right side there are shown the simulation stats and the fitness plot. The stats contain information like the choosen algorithm, algorithm specific parameters, the amount of processed generations, fitness values, etc. The fitness plot is automatically resized with increasing generations to fit in the plotting area. The red plot shows the best fitness for each generation. The grey one shows the average fitnesses.