ETH
Eidgenössische Technische Hochschule Zürich
Swiss Federal Institute of Technology Zurich

Lecture with Computer Exercises:
Modelling and Simulating Social Systems

Project Report

Vector based navigation of desert ants

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Agreement for free-download

We hereby agree to make our source code for this project freely available for download from the web pages of COSS. Furthermore, we assure that all source code is written by ourselves and is not violating any copyright restrictions.

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Contents

1 Abstract

2 Individual contributions

3 Introduction and Motivations

3.1 Motivation

we wanted to do an unconventional poject, simulating emergency situations has been done multiple times. Expanding horizon

3.2 Hypothesis

description of base paper (who did it, roughly what was it all about)

4 Description of the Model

4.1 Behavior of the ant

how did Wehner think global and local vector worked (Wehner [1998])

4.2 Conducted experiments

description of the experiments Wehner conducted (explanation of channel, cylinder, etc.)

5 Implementation

with code examples

5.1 Main Concept

we use an iterative approach, calculate local and global vector new in every step, merge them together(explain how). Save steps, plot them

5.2 Global Vector

explain how it gets calculated, and randomized

5.3 Local Vector

explain how it gets calculated and influenced by surroundings

6 Simulation Results and Discussion

6.1 Simulation Results

what did we get, is it the same

6.2 Discussion

what was different, probably the randomization was no as in real life

7 Summary and Outlook

7.1 Summary

it worked pretty well, Wehner did a good job, his experiments corresponds to our simulation, which was based on his theory. We do not know if its biologically correct

7.2 Outlook

we probably will not continue our research about desert ants, maybe Wehner will

8 References

M. Collett T. S. Collett S. Bisch R. Wehner. Desert ant navigation. *Nature Magazin*, 394, July 1998.

9 Latex-Stuff

Beispielverweisung:
Hier wird auf dieses Bild verwiesen (fig. 1 on the following page)
Python Code:

Listing 1: Python code example

```
import numpy as np

# show numbers 0-9
```

```
print ('Numbers from 0-9')
for i in range(10):
        print(i)
```

Figure 1: Beispielbild, in Ordner images

Beispielliste:

- erster Eintrag
- zweiter Eintrag