

Lab Report: The Distributed System of Ant Foraging

Team Members:

Name _____ PID _____

Name _____ PID _____

Name _____ PID _____

Name _____ PID _____

NOTES

Initial observations of parameter changes, consequences, insights, questions, etc.

A) Sensitivity to simple constraints

Describe, qualitatively and quantitatively, how each parameter (population, diffusion-rate, evaporation-rate) affects behavior. That is, what happens when the parameters are set at the extreme values (both high and low)? What combination of values leads to the most successful foraging? Consider ways to simply & clearly graphically represent this information, and show one..

B) From individuals to interaction

The NetLogo Ants page says that “the colony as a whole acts in a sophisticated way.” In what ways does the behavior of the colony differ from the behavior of the individual ants? What properties of the colony emerge from the simple, dynamic interactions of the ants? Why might the particular configuration of parameters that you found above, be the one most likely to produce such system-level organization?

C) Patterns in space & time: What is a “stable trail”?

Like the cars in a traffic jam, the ant membership of a stable trail changes continuously with new ants joining and old members leaving. If a stable trail is not defined by a particular collection of ants, what does a stable trail consist of? Think in terms of dynamic relations among elements rather than in terms of the elements alone (elements = ants, food, nest, chemical, range of next possible moves). What dynamic relations (in space and time) compose the stable trail?