

Agent
Input, Output, and Implementation

NetLogo turtles

- xcor
- ycor
- color
- heading
- right *degrees*
- left *degrees*
- forward *value*

The Observer executes the diffuse command

The environment is discrete, the turtles are continuous

The Observer sees a turtle at 0 degrees when it is upward, the turtle always has 0 degrees in front of it - the turtle is egocentric

Don't let turtles talk about heading

[in-radius] ; can generate an agent set so that the turtle can see around itself

[in-cone] ; in-radius is restricted

Correlated Random Walk - current direction is not completely independent of direction history

Pure Random Walk - current direction is independent of direction history

A world of max-pxcor and max-pycor of 40 is 81 by 81 dots.

Homework: Change the program to produce different types of behavior - straight lines, circles, spirals, zig zag, and art

Statistics of the Random Walk

Isometric - direct relationship

Allometry - study of the relation of body size to shape, anatomy, physiology, and behavior

The Hercules Beetle, where a small change of body size and lead to a much bigger jaw

$y = kx^a$ or $\log y = a \log x + \log k$

Allometry corresponds to curves of the form $y = ka^p$

Random walk - mathematical formalization of a path that consists of a succession of random steps

Levy flight - random walk in which step-lengths have a probability distribution that is heavy-tailed.

Cauchy flight - Cauchy distribution

Rayleigh flight - normal distribution

$\Pr(U > u) = 1 : u < 1$

$u^{-D} : u \geq 1$

