

Bats Take Flight

Definition of the problem:

Our team has recently visited Carlsbad Caverns and watched the bats fly in and out of the cave. This made us interested in how they are able to fly from inside the cave and all the way out despite the many obstacles. Our teams noticed that they use a spiral pattern while flying out and that they then fly on their separate ways in order to hunt.

Plan for solving the problem and representing it computationally:

We plan on talking to the research scientist at Carlsbad again to get more information. Also by reading books and going online to find information on the topic. Also some relatives and friends know more about bats, especially since quite a few fly around Melrose.

We are making our model using the NETLOGO program. We have been studying how the pre-made "flocking" procedure works and we hope we can use the 3D version to make our model more interesting for this assignment.

Some variable that our model will include are: the number of bats, the amount of obstacles, how tightly they can turn and maneuver, and the amount of time they have to go back and forth from their feeding areas. Our model will have the size of the cavern opening stay as a fixed variable.

Progress to date:

We have been researching bat populations and behavior with how they group together and split into different bands. We have started learning about the NETLOGO 3D program, but we realize that we will need help to learn how to make it work properly. We are looking for help with this from individuals we met at the Kickoff.

Expected Results and Usefulness:

Our team is expecting to find out how the bats fly out of the cave to find water and food for themselves and their young ones and use this to make a model of their behavior. We also want to use the 3D modeling program to show how they fly as if they separate to forage with groups of other bats.

Another main result we hope to achieve is learning more about computer modelling and how to use the NETLOGO programs.

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Citation of research:

1. Field Trip: Carlsbad Caverns, Carlsbad New Mexico 88220 Fall 2016.
2. Bats- Wikipedia.com. Website showing how bats fly.
3. Wdfw.wa.gov/living/bats.html. Website showing bat ecology.
4. Batworlds.com. Website showing how bats live.
5. Book- "The Secret Lives of Bats: My Adventures with the World's Most Misunderstood Mammals". Author: Merlin D. Tuttle Published: 2015 by Houghton Mifflin Harcourt, Boston 2015