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Richard Freedman* (freerg8@wfu.edu) and **Errin Fulp** (fulp@wfu.edu). *Weighted and Unweighted Random Walks of Multiple Entities on a Torus-Shaped World*. Preliminary report.

A new approach to network security involves multiple "agents" walking about a network in search of suspicious activity. An Ant-Colony Organization (ACO) algorithm allows the initially random walk to become more guided as the target is located by some of the agents. The mean number of steps it takes for an agent to "succeed" and find such a target is called the expected hit time. In this talk, we will discuss the expected hit time and the probabilities of success and failure for these walks over time using a discrete dynamical system based on a network that creates a torus-shaped world. Particular focus will be placed on the worst-case (fully random walk) and best-case (fully weighted random walk) scenarios for x agents in the network. (Received September 21, 2010)