Ants could inspire military strategies

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Courtesy University of Granada
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A researcher has designed a system that uses ant colonies' behavior to help plan troop movements on battlefields.

The Spanish army is looking into using some features of the system, according to the University of Granada scientists involved in the project.

Ants are noted for their ability to find the shortest path from their nest to a food source.

University of Granada researcher Mora García developed formulas for choosing the best route path for troops within particular environments, maximizing speed of movement while minimizing casualties. The main procedure involved is called the "ant colony optimization algorithm," a probabilistic technique inspired by the behaviors of ant groups in seeking out food.

Ants on such a mission tend to wander randomly at first, laying down a chemical trail as they walk. When an ant finds food, its path becomes covered with the chemicals, called pheromones. But this chemical trail evaporates gradually. Therefore, shorter paths between the colony and a food source are associated with stronger trails, since they have had less time to evaporate.

This phenomenon helps ants that join the search later to locate the best available paths. The group as a whole then converges by degrees on the most efficient solution.

A range of studies have focused on developing computer simulations of this sort of ant problem-solving process.

The University of Granada work produced a mini-simulator software that also takes into account new factors such as the enemy presence, the scientists involved said. The software defines battlefield settings, locates the troops unit and enemies, executes the formulas and analyzes the results. The idea is that troops could follow a computer-provided solution without having to first go through the "random walk" stage.

García started the research using play battlefields from the videogame "Panzer General," then modified them to make them more realistic.

The project also had the participation of members of the Spanish Army's Doctrine and Training Command. The scientists say the simulator could also be useful to solve other problems, such as finding the most efficient path for a sales agent to visit clients, or for distributing goods.