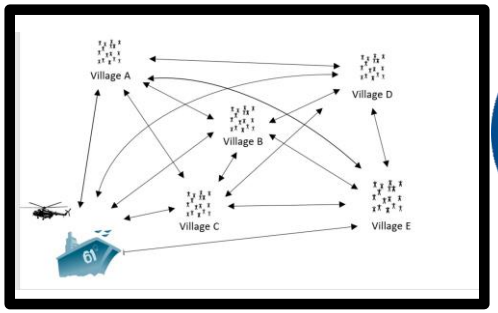
Autonomous Aid



Scenario 1

1. Select a path and calculate the fuel consumed, number of people saved, and time to visit each village, with no constraints.
2. Find a path that saves the most people with fuel and time constraints (optimization)
3. Select a "humanitarian algorithm" for providing aid to villages. Decide what you are optimizing and plan an appropriate path.
4. Program a calculator robot to follow your algorithm using the "1" command only.
5. Program a calculator robot to "adapt" by using the "3" command and placing barriers to change its path.

Scenario 2

6. Apply your "humanitarian algorithm" to new scenarios.
7. Determine whether your algorithm had the desired outcome.

Algorithms provide a set of instructions that are based on mathematical models describing the system. Some algorithms are dynamic and adapt to changing parameters; others are static or deterministic. The efficacy of a mission depends on an accurate model and on the correct implementation of that model in a decision-making algorithm.

Scientific Information

Operations research is the field of mathematics that applies analytical techniques (such as mathematical models, statistics, and optimization) to algorithms that make complex decisions.

NAVY NOTES

Applications

In 2010, devastating floods resulted from monsoons in Karachi, Pakistan. The immediate need for clean water, food and medical supplies led to international humanitarian efforts to reach the victims, even as the storms and flooding continued. With a limited number of helicopters, the US Navy and Marines prioritized their relief mission by the amount of damage/isolation, the presence of families and the current weather/flying conditions.

Learn more: http://usnhistory.navylive.dodlive.mil/2015/08/29/find-the-good-and-do-it-navys-response-to-hurricane-katrina/