Abstract

This paper presents a new model developed to aid the planning and the analysis of communications-intensive Mobile Ad Hoc Networks (MANET), with respect to the allocation of energy-critical equipment. A graphical simulation tool and a new hybrid genetic algorithm (HGA) are introduced. They work together to estimate the required amount of deployed battery supplies and the probability of success of real operations. At each period, a hybrid genetic algorithm with reparation of individuals and heuristic crossover and mutation operators finds efficient routes that preserve maximum energy availability at network level, reducing the probability of communications disruption. The simulation tool implements mobility models derived from experts’ advices and may be used in missions like military and search-and-rescue operations. One may easily include new models to represent the movement of nodes in other specific missions, including trace data. The system is flexible and customizable, providing a means to mission planning, including the provision of adequate power supply for the large number of devices typically included within a MANET.
A Simulation Model and a Hybrid Genetic Algorithm for Energy-Aware MANET Routing and Planning

References


18. X. Hong, T. J. Kwon, M. Gerla and D. Lihu, "A Mobility Framework for Ad Hoc Wireless


Index Terms

Computer Science                                 Wireless

Keywords