ABSTRACT

MAXIMIZING TARGET COVERAGE OF UNMANNED AERIAL VEHICLE CARRIED ON MOBILE PLATFORM

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This thesis proposes a solution approach for target mazimization problem for a range constrained unmanned aerial vehicle (UAV) carried on mobile platform. The problem is modeled with extending the Vehicle Routing Problem (VRP) with the constraints of range capacity and depot mobility and this novel extension is termed Capacitated Mobile Depot VRP (C-MoDVRP) throughout this study. Requirement of a novel solution approach dictated by the nature of this problem is satisfied by adapting a genetic algorithm (GA-CMoD) for the problem specific constraints. The motivation, problem definition, and development of the proposed solution along with its implementation are given in the thesis. Moreover, the performance of the proposed GA-CMoD is observed by extensive simulation tests under different problem constraints. The quality of the produced routes is compared with that of the alternative solution methods. The experiment test results indicate the success of the proposed solution over the alternative ones clearly.

Keywords: Genetic Algorithm, Capacitated Mobile Depot Vehicle Routing Problem, Carrier Deployed Unmanned Aerial Vehicle, Target Maximization, Range Constraint