

Abstract

Vehicle Routing Problem with Drone (VRPD) is an extension of the classic vehicle routing problem, in which not only trucks but also drones are used for package delivery to the customer. One of the salient features of VRPD is that drones are used alongside trucks to deliver packages. Navigating trucks and drones in an integrated manner makes the issue much more challenging and different from the classic vehicle routing literature. This dissertation presents a programming model based on multi-objective genetic algorithm for simultaneous reduction of mileage, package delivery time as well as package delivery cost. Extensive experiments are performed on samples that are randomly generated in a practical environment, and the results show good computational performance of the proposed algorithm. The simulation results show that the proposed method is more efficient than other methods in terms of reducing the cost of time and path length. Based on the results, the proposed method has reduced costs by 2 to 8% in the same period.

Keywords: vehicle routing; drone; optimization Algorithm; Genetic algorithm.