Raising Fairness Issue of Vehicle Routing Problem

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***Abstract*—Since fairness deals with the quality of distributing the jobs and creates an ambience that is free from any discrimination, any distribution management problem must take fairness issue into consideration. Again, since the *Vehicle Routing Problem (VRP)* is also a distribution management problem, any *VRP* solving algorithm must consider the fairness when solutions are explored. However, most of the proposed *VRP* solving algorithms do not take this issue into consideration. In this paper, we raise this issue with sufficient evidences. In this course of action, following contributions are made in this paper: *i)* fairness issue is raised analytically, and to support this, an extensive simulation campaign is performed, *ii)* the *VRP* is discussed through a practical application, namely *Garbage Collection Problem (GCP)*, and later it is mathematically formulated, *iii)* a *Genetic Algorithm (GA)* is employed to explore feasible solutions for the given application (i.e., *GCP*), and *iv)* some future research directives are noted, which will help the researchers to extend this work.**

Keywords-vehicle routing problem, capacitated vehicle routing problem, garbage collection problem, fairness, genetic algorithm.