

Proceedings of the 3rd Annual World Conference
of the Society for Industrial and Systems Engineering,
San Antonio, Texas, USA
October 20-22, 2014

A Comparative Study of Metaheuristics in VRPSD

P. H. I. Sánchez¹, R. J. P. Alejo¹, D. G. González¹, and E. L. García²

¹COMIMSA (Corporación Mexicana de Investigación en Materiales)
No 790 Col. Saltillo 400, C.P. 25290 Saltillo, Coahuila. México

²Universidad Autónoma de Coahuila Facultad de Sistemas
Carretera a México Km 13, 25280 Arteaga, COAH, Mexico

Corresponding author's E-mail: pedro.ireta@comimsa.com

Abstract: The Vehicle Routing Problem (VRP) is one of the most studied problems about combinatorial optimization. In order to solve this issue, several methods have been proposed. VRP turns into a difficult problem when constraints are added. Nevertheless, VRP might be only focused when we know and are able to fix the customer demand. On the other hand, when demands are uncertain, this problem becomes even more complicated. For instance we can mention: visiting all clients in the same order (a priori route), visiting clients who require certain services, catering or skipping those clients that do not have any kind of demand. In both cases, penalty is applied. For this reason, this paper is about comparing the Genetic Algorithm (GA) and classical Simulated Annealing (SA) with the purpose of solving VRP with Stochastic Demand. It is important to point out that exchange mutation was applied for generating new solutions into Genetic Algorithm and a real case study was applied for comparing the algorithms performance.

Keywords: Vehicle Routing Problem, Metaheuristics, Optimization.