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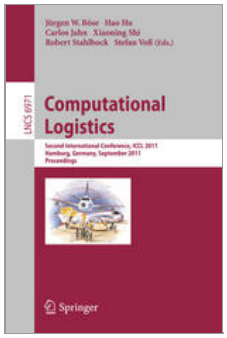
Multiobjective Evolutionary Algorithm for Redesigning Sales Territories

Abstract

Redesigning sales territories is a strategic activity that seeks to improve customer's service level, sales costs and the quality's life of the salesmen to gain a competitive advantage in the market. In this paper we propose a multiobjective evolutionary algorithm for redesigning sales territories inspired by a company dedicated to sell products along Mexico. One objective seeks to minimize new turnover variation against the current ones of the salesmen. The other objective looks at compacting territories through minimizing the sum of the distance traveled of its salesmen. Each territory is restricted to a maximum workload and the conservation of the residence places of the salesmen in new territorial configurations. Through an evolutionary algorithm we seek to solve large instances that have not been solved by an exact method.



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References (23)

1. Bação, F., Lobo, V., Painho, M.: Applying genetic algorithms to zone design. Soft Computing 9, 341–348 (2006) CrossRef
2. Bação, F., Painho, M.: A point approach to zone design. In: 5th AGILE Conference on Geographic Information Science, Palma, Balearic Islands, Spain (2002)
3. Bennett, D., Xiao, N., Armstrong, M.: Exploring the geographic consequences of public policies using evolutionary algorithms. Annals of the Association of American Geographers 94, 827–847 (2004)
4. Coello, C., Lamont, G., Van Veldhuizen, D.: Evolutionary Algorithms for Solving Multi-Objective Problems. Springer, Berlin (2007)
5. Correa, J., Ruvalcaba, L., Olivares-Benitez, E., Aguilar, J., Macias, J.: Biobjective model for redesign sales territories. In: 15th Annual International Conference on Industrial Engineering: Theory, Applications and Practice (IJIE), Mexico (2010)
6. Datta, D., Figueira, J., Fonseca, C. M., Fernando, T.P.: Graph partitioning through a multi-objective evolutionary algorithm: A preliminary study. In: Genetic and Evolutionary Computation Conference (GECCO 2008), Atlanta, GA, pp. 625–632 (2008)
7. Floyd, R.W.: Algorithm 97: Shortest path. Communications of the ACM 5, 345 (1962) CrossRef
8. Gentile, G., Tiddi, D.: Clustering methods for the automatic design of traffic zones. In: SIDT International Conference, Milan, Italy (2009)
9. Roji, G.: By Mexico's highways (2010)
10. Guo, J., Trinidad, G., Smith, N.: MOZART: a multi-objective zoning and aggregation tool. In: Proceedings of the Philippine Computing Science Congress (PCSC), pp. 197–201 (2000)
11. Kalcsics, J., Nickel, S., Schröder, M.: Towards a unified territory design approach - applications: Algorithms and GIS integration. Fraunhofer ITWM, Kaiserslautern (2005)
12. Ricca, F.: A multicriteria districting heuristic for the aggregation of zones and its use in computing origin-destination matrices. INFOR 42(1), 61–77 (2004)
13. Ricca, F., Simeone, B.: Local search algorithms for political districting. European Journal of Operational Research 189, 1409–1426 (2008) CrossRef
14. Rothlauf, F.: Representations for Genetic and Evolutionary Algorithms, 2nd edn. Springer, Berlin (2006)
15. Salazar-Aguilar, M.A., Ríos-Mercado, R.Z., González-Velarde, J.L.: GRASP strategies for a bi-objective commercial territory design problem. Journal of Heuristics (2011); doi:10.1007/s10732-011-9160-8
16. Secretaría de Comunicaciones y Transportes / Communications and Transportation Secretary, http://www.sct.gob.mx/carreteras/ , last call (July 15, 2011)
17. Takashi, K.: Designing elementary school districts using a genetic algorithm: Case study of Suita City, Osaka. Geographical Review of Japan 79(4), 154–171 (2006)
18. Tavares-Pereira, F., Figueira, J., Mousseau, V., Roy, B.: Multiple criteria districting problems. The public transportation network pricing system of the Paris region. Annals of Operations Research 154, 69–92 (2007)
19. Wei, B.C., Chai, W.Y.: A multiobjective hybrid metaheuristic approach for GIS-based spatial zone model. Journal of Mathematical Modelling and Algorithms 3, 245–261 (2006) CrossRef
20. Xiao, N.: A unified conceptual framework for geographical optimization using evolutionary algorithms. Annals of the Association of American Geographers 98, 795–817 (2008) CrossRef
21. Zäpfel, G., Braune, R., Bögl, M.: Metaheuristic Search Concepts: A Tutorial with applications to Production and Logistics. Springer, Berlin (2010)

22. Zoltners, A.: A unified approach to sales territory alignment. In: Sales Management: New Developments from Behavioral and Decision Model Research, pp. 360–376. Marketing Science Institute, Cambridge (1979)

23. Zoltners, A., Sinha, P.: Sales territory alignment: A review and model. Management Science 29, 1237–1256 (1983) CrossRef

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