

Route Optimization for E-Commerce Logistic Systems

Darshan Jodh¹, Aditya Padwal², Pratik Gaikwad³, Pratik Bhujbal⁴, Prof. K.A. Shinde⁵

Students, Department of Computer Engineering^{1,2,3,4}

Professors, Department of Computer Engineering⁵

Sinhgad Institute of Technology and Science, Pune, India

Abstract: *E-Commerce Business is widely spread all around the world, and explored by almost half the population of the world, because of its facility that it provides doorstep delivery. You just need to place the order on e-commerce website and within Two to three days max the order gets delivered at your doorstep. But it's a challenge for e-commerce logistic department (ECL) to manage this order and delivery chain. They need to have a predefined strong network of order and delivery chain. While delivering the small parcels e-commerce department considers delivery assistant/ Boy to deliver these parcels. For a Single Delivery assistant it's very hard and headache job to deliver packages accordingly. Here the problem arrives of last mile distribution, completing target deliveries before deadline. This project aims to solve the last-mile distribution of e-commerce logistics (ECL) for the survival of third-party logistics enterprise. Delivery assistant have software which navigates them towards the delivery address. But this creates headache and waste of time while delivering parcels one by one separately without having an optimized route which connects all the target parcels to be delivered in a day. Route Optimization software needs to develop to solve these problems. This project aims to develop an optimized solution on above problems based on multiple source multiple destination approach using Dijkstra's algorithm and scripted using python libraries. On this basis, the improved Dijkstra was proved effective through example analysis on the said test data sets. The analysis results also reflect how the number of vehicles affects the maximum profit of the logistics enterprise and the coverage of the ECL logistics network.*

Keywords: Route Optimization, ACO (Ant Colony Optimization), Dijkstra's Algorithm, Python, ECL (E-Commerce Logistics System), multiple source multiple destination approach, Machine learning (ML).

REFERENCES

- [1]. Li Wenzheng , Liu Junjun, Yao Shunli, "An Improved Dijkstra's Algorithm for Shortest Path Planning on 2D Grid Maps " 2019.
- [2]. Mr. Ashish Nage, Mr. Ashish Nage, "Detection and Identification of Plant Leaf Diseases Based on Python", International Journal of Engineering Research and Technology (IJERT), May 2019.
- [3]. C. Archetti, N. Bianchessi, and M. G. Speranza, "Branch-and-cut algorithms for the split delivery vehicle routing problem," Eur. J. Oper. Res., vol. 238, no. 3, pp. 685698, Nov. 2014.
- [4]. P. Vansteenwegen, W. Souffriau, and D. V. Oudheusden, "The orienteering problem: A survey," Eur. J. Oper. Res., vol. 209, no. 1, pp. 110, Feb. 2011.
- [5]. N. Azi, M. Gendreau, and J.-Y. Potvin, "An exact algorithm for a single-vehicle routing problem with time windows and multiple routes," Eur. J. Oper. Res., vol. 178, no. 3, pp. 755766, May 2007.
- [6]. J. Tan, G. Jiang, and Z. Wang, "Evolutionary game of information sharing on supply chain network based on memory genetic algorithm," J. Eur. Syst. Automat., vol. 50, nos. 46, pp. 507519, Dec. 2017.