TITLE (A SHORT DESCRIPTION OF THE PROJECT, BETWEEN 8 AND 12 WORDS

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ABSTRACT

Using electric vehicles to deliver packages to clients on the most optimal routes is super important. Fast deliveries provide great benefits to their owners and dealers. For example, better and faster service to your customers, decrease energy consumption and increase productivity.

1. INTRODUCTION

Electric vehicles are the future of mobility due to its efficiency in consumption-travel and, most importantly, their low ecological footprint, because, it do not harm nature. Its disadvantages are few, such as limited driving range and the battery charging time is relatively long. For this reason, it is important to find the best possible route to move. In this case, electric mobility will be used for the shipment of merchandise, and parcel service.

2. PROBLEM

The poor optimization of the routes for product deliveries with electric vehicles generates a lot of energy consumption and recharge time in the shipment. These are necessary to deliver all the packages of the day with fewer delays due to the energy load.

3. RELATED WORK

3.1 Combinatorial optimization for electric vehicles management (EnSPP)

The EnSPP consists of finding optimal origin-destination routes for EV by maximizing the vehicles battery charge at the destination node.

> Nora Touati Moungla and Vincent Jost. 2011.(January 2011). Retrieved February 21, 2021 from http://www.icrepq.com/icrepq'11/504-touati.pdf

3.2 Vehicle Routing Problem (VRP)

Is a combinatorial Optimization and integer programming problem which asks "What is the optimal set of routes for a fleet of vehicles to traverse in order to deliver to a given set of customers? so the size of problems that can be solved, optimally, using mathematical programming or combinatorial optimization may be limited. Therefore, commercial solvers tend to use heuristics due to the size and frequency of real world VRPs they need to solve.

> Anon. 2021. Vehicle routing problem. (January 2021). Retrieved February 22, 2021 from https://en.wikipedia.org/wiki/Vehicle_routing_problem

3.3 ElectricVehicle Routing Problem (e-VRP)

Electric Vehicle Routing Problem (EVRP) that finds the optimal routing strategy with minimal travel time cost and energy cost as well as number of EVs dispatched. That can be solved using MILP formulation (which can adapted to model different charging assumption), and a set of small instances with a real information about

> Alejandro Montoya. 2017. Electric Vehicle Routing Problems : models and solution approaches. (January 2017).fromhttps://tel.archives-ouvertes.fr/tel-01441718/document

3.4 Traveling Salesman Problem (TSP)

The Travelling Salesman Problem (TSP) is the challenge of finding the shortest yet most efficient route for a person to take given a list of specific destinations. It is a well-known algorithmic problem in the fields of computer science and operations research. Some of their solutions are the Brute-Force approach, the Branch and Bound Method, the Nearest Neighbor Method

> Suzanne Ma. 2020. Understanding the Travelling Salesman Problem (TSP). (January 2020). from https://blog.routific.com/travelling-salesman-problem#:~:text=To%20solve%20the%20TSP%20using,this%20is%20the%20optimal%20solution.&text=This%20method%20breaks%20a%20problem,solved%20into%20several%20sub-problems.

REFERENCIAS

1. Nora Touati Moungla and Vincent Jost. 2011.(January 2011). Retrieved February 21, 2021 from http://www.icrepq.com/icrepq'11/504-touati.pdf

2. Suzanne Ma. 2020. Understanding the Travelling Salesman Problem (TSP). (January 2020). from https://blog.routific.com/travelling-salesman-problem#:~:text=To%20solve%20the%20TSP%20using,this%20is%20the%20optimal%20solution.&text=This%20method%20breaks%20a%20problem,solved%20into%20several%20sub-problems.

3. Alejandro Montoya. 2017. Electric Vehicle Routing Problems : models and solution approaches. (January 2017).fromhttps://tel.archives-ouvertes.fr/tel-01441718/document

4. Anon. 2021. Vehicle routing problem. (January 2021). Retrieved February 22, 2021 from https://en.wikipedia.org/wiki/Vehicle_routing_problem