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使用模擬退火演算法規劃多人共乘車之路徑

曾繁勛^{1,*} 簡暉哲² 賴槿峰³ 江華珮⁴ 趙涵捷⁵

¹ 國立臺灣師範大學科技應用與人力資源發展學系助理教授

² 國立成功大學工程科學系博士生

³ 國立成功大學工程科學系副教授

⁴ 遠傳電信股份有限公司網路暨技術事業處資深協理

⁵ 國立東華大學電機工程學系教授

摘要

近年來，伴隨著物聯網的蓬勃發展，智慧城市是一個嶄新的研究領域，其中，便利的交通運輸成為熱門的研究議題，旨在解決交通擁塞問題並提升交通的靈活性，成就更有效率的智慧運輸系統。然而，現有的共乘車研究大多侷限於固定路線，乘客得根據需求點上下車，而非依據乘客的需求來規劃對應之乘車路線，因此，本研究提出一個嶄新的共乘車概念，定義多人共乘車之路徑規劃問題，分別提出模擬退火等待時間演算法與模擬退火最短路徑演算法，模擬結果顯示，本研究提出的方法能因應不同的使用者需求而規劃最適合的共乘車行車路線。

關鍵詞：共乘車、啟發式演算法、智慧運輸系統、智慧城市、路徑規劃

* 通訊作者：曾繁勛

電子郵件：fhtseng@ntnu.edu.tw

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Path Planning by Simulated Annealing for Multi-Passengers Ride-Sharing Vehicle

Fan-Hsun Tseng^{1,*}, Wei-Che Chien², Chin-Feng Lai³,
Hua-Pei Chiang⁴, Han-Chieh Chao⁵

¹Assistant Professor, Department of Technology Application and Human Resource Development,
National Taiwan Normal University

²Ph.D. Student, Department of Engineering Science, National Cheng Kung University

³Associate Professor, Department of Engineering Science, National Cheng Kung University

⁴Senior Director, Network and Technology Division, FarEasTone Telecommunications Company Limited

⁵Professor, Department of Electrical Engineering, National Dong Hwa University

Abstract

In recent years, smart city accompanies with Internet of Things development is a novel research field. The convenient transportation is a vital research issue. It aims at solving traffic congestion problem and improving traffic flexibility. In addition, it achieves intelligent transportation systems more efficient and convenient. However, existing literature on ride-sharing vehicle is mostly restricted to fixed routes. Passengers must get on and off ride-sharing vehicle according to boarding points and alighting points rather than their requirements of travel routes. As a result, the paper presents a novel ride-sharing method. We define the path planning problem of multi-passengers for ride-sharing vehicles then propose two algorithms, i.e., simulated annealing-based waiting time algorithm and simulated annealing-based shortest path algorithm. The simulation results show that the proposed method in the paper is able to plan the most suitable routes for multi-passengers ride-sharing vehicles.

Keywords: ride-sharing vehicle, metaheuristic algorithm, intelligent transportation system, smart city, path planning

*Corresponding Author: Fan-Hsun Tseng
E-mail: fhhseng@ntnu.edu.tw