Driver Burnout and the Fuzzy Vehicle Routing Problem

Anisha Khaitan
Department of Operational Research
Faculty of Mathematical Sciences, University of Delhi
New Delhi - 110007, India
anishakhaitan.du.or50@gmail.com

Abstract

Drivers are the foundation blocks of the transportation and logistics industries. Any damage to the foundation can topple the entire structure. Therefore, the well-being of drivers is of utmost priority and unfortunately, often overlooked. The availability of extensive literature on driver burnout and technological advancements in natural language programming (NLP) techniques motivated the development of the idea presented here. Multiple research articles on driver behaviour, driver burnout and driver fatigue are analyzed using NLP on Python to cluster the factors responsible for driver burnout. A burnout function is created using the controllable factors derived from NLP. This function is used as an objective in a multiobjective fuzzy vehicle routing problem (VRP). The problem is coded and solved using a genetic algorithm (GA) to derive trade-off solutions for the VRP and the well-being of the drivers. Incorporating a driver burnout/well-being function in a fuzzy VRP, where the burnout function is created using factors derived from text analytics forms the novelty of the approach proposed hereafter.

Keywords
Driver burnout, fuzzy set theory, genetic algorithm, natural language processing and vehicle routing problem.

Biography

Anisha Khaitan is currently pursuing the Ph.D. degree in Operational Research from the Department of Operational Research, University of Delhi, Delhi, India. Her current research interests include soft computing, artificial intelligence, and fuzzy optimization. To date, she has published four research papers in reputed international journals, viz., IEEE Transactions on Fuzzy Systems, International Journal of Production Research, and International Journal of Intelligent Systems.