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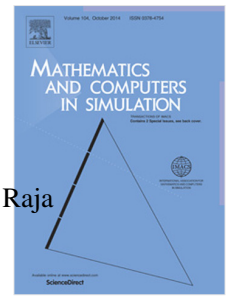

Traffic assignment: Methods and simulations for an alternative formulation of the fixed demand problem

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Traffic Assignment: Methods and Simulations for an Alternative Formulation of the Fixed Demand Problem

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Abstract

Motorists often face the dilemma of choosing the route enabling them to realise the fastest (i.e., shortest) journey time. In this paper we examine discrete and continuous optimisation and equilibrium-type problems for a simplified parallel link traffic model using a variance based approach. Various methodologies used for solving these problems (brute force, dynamic programming, tabu search, steepest descent) are explored and comparison is made with the Beckmann cost function traditionally employed in transport modelling.

Key words: Traffic assignment, Optimal flow, Equilibrium flow, Tabu search, Dynamic programming

1. Introduction

A dilemma often facing transport planners is to choose whether to leave motorists free to make their own route choices where they aim to minimise their own travel times, or to try to actively manage the traffic flows in order to minimise the total journey times for all motorists travelling between origin and destination, i.e., whether to plan or not to plan?

Assuming that journey time is the only criteria for route choice, car travellers may be seen to act selfishly as self optimisers insofar as they usually want to minimise their own journey times. As a consequence of this policy, in the absence of any effective traffic control measures, route switching by the travellers to what they perceive to be the fastest route will act to produce a steady state where all (used) routes have an approximately equal travel time. The resultant total travel time at this *equilibrium* flow will be greater than that obtained for the *optimal* flow, achieved in the presence of a perfect traffic control system.

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