

## Accepted Manuscript

A Hybrid Dynamic Programming and Memetic Algorithm to the Traveling Salesman Problem with Hotel Selection

Yongliang Lu, Una Benlic, Qinghua Wu

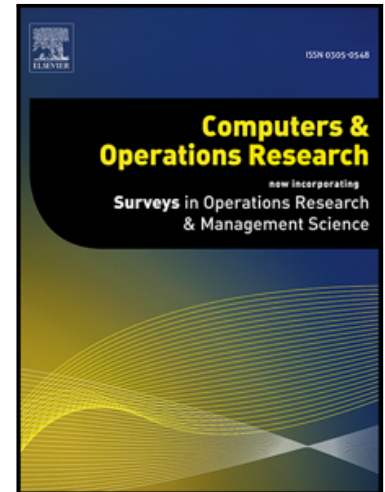
PII: S0305-0548(17)30231-9  
DOI: [10.1016/j.cor.2017.09.008](https://doi.org/10.1016/j.cor.2017.09.008)  
Reference: CAOR 4320

To appear in: *Computers and Operations Research*

Received date: 14 April 2017  
Revised date: 7 September 2017  
Accepted date: 9 September 2017

Please cite this article as: Yongliang Lu, Una Benlic, Qinghua Wu, A Hybrid Dynamic Programming and Memetic Algorithm to the Traveling Salesman Problem with Hotel Selection, *Computers and Operations Research* (2017), doi: [10.1016/j.cor.2017.09.008](https://doi.org/10.1016/j.cor.2017.09.008)

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



# A Hybrid Dynamic Programming and Memetic Algorithm to the Traveling Salesman Problem with Hotel Selection

Yongliang Lu <sup>a</sup>, Una Benlic <sup>b,c</sup>, Qinghua Wu <sup>a,\*</sup>

<sup>a</sup>*School of Management, Huazhong University of Science and Technology, No. 1037, Luoyu Road, Wuhan, China, email: luyongliang@hust.edu.cn; qinghuawu1005@gmail.com*

<sup>b</sup>*School of Electronic Engineering and Computer Science, Queen Mary University of London, London, email: u.benlic@qmul.ac.uk*

<sup>c</sup>*University of Electronic Science and Technology of China, North Jianshe Road, Sichuan 610054*

---

## Abstract

The Traveling Salesman Problem with Hotel Selection (TSPHS) is a variant of the classic Traveling Salesman Problem. It arises from a number of real-life applications where the maximum travel time for each “day trip” is limited. In this paper, we present a highly effective hybrid between dynamic programming and memetic algorithm for TSPHS. The main features of the proposed method include a dynamic programming approach to find an optimal hotel sequence for a given tour, three dedicated crossover operators for solution recombination, an adaptive rule for crossover selection, and a two-phase local refinement procedure that alternates between feasible and infeasible searches. Experiments on four sets of 131 benchmark instances from the literature show a remarkable performance of the proposed approach. In particular, it finds improved best solutions for 22 instances and matches the best known results for 103 instances. Additional analyses highlight the contribution of the dynamic programming approach, the joint use of crossovers and the two local search phases to the performance of the proposed algorithm.

*Keywords:* dynamic programming; the traveling salesman problem; infeasible local search

---

\* Corresponding author.

Download English Version:

<https://daneshyari.com/en/article/4958869>

Download Persian Version:

<https://daneshyari.com/article/4958869>

[Daneshyari.com](https://daneshyari.com)