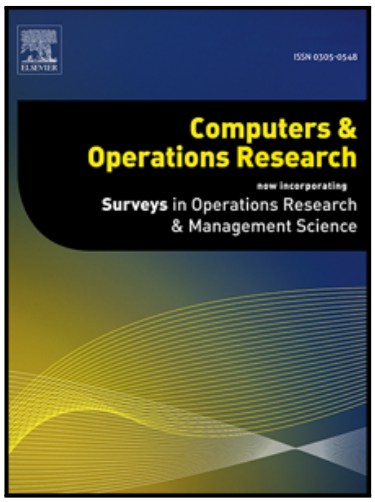

Vehicle Routing and Appointment Scheduling with Team Assignment for Home Services

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PII: S0305-0548(18)30190-4
DOI: 10.1016/j.cor.2018.07.006
Reference: CAOR 4513

To appear in: *Computers and Operations Research*

Received date: 12 October 2017
Revised date: 4 July 2018
Accepted date: 5 July 2018

Please cite this article as: Yang Zhan, Guohua Wan, Vehicle Routing and Appointment Scheduling with Team Assignment for Home Services, *Computers and Operations Research* (2018), doi: 10.1016/j.cor.2018.07.006

Highlights

- We propose a relevant new problem which originates from the scheduling of tasks in home services (a service provider with a set of teams to service a set of geographically distributed customers), the RASTA problem.
- We develop an integrated model for the RASTA problem concerning: (1) team assignment, (2) routing, and (3) appointment scheduling, when the service times are random.
- A heuristic algorithm based on Tabu Search (TS) is proposed to solve practical-size problem in reasonable time. It employs TS to improve the initial feasible solution obtained by a modified parallel savings (MPS) algorithm.
- We experimentally demonstrate the effectiveness and efficiency of the TS-based heuristic algorithm. It is showed that the algorithm can produce optimal or near-optimal solution for the problem and it significantlyoutperforms the approach that separately optimizes assignment, routing, and appointment scheduling.
- Computational experiments show that considering the randomness of service times is significant and jointly considering the decisions of team assignment, routing, and appointment scheduling is beneficial.