

Yangguang Wang

EDUCATION & EXPERIENCE



University of Science and Technology of China (USTC), China

Research Assistant (Full-time) of School of Management, USTC

July 2021 - Present

Research Engineer (Part-time) of Modern Logistics Research Center, USTC

University of Science and Technology of China, China

USTC is one of the top “985 / 211 / Double First-Class” universities in China

Academic Master, Management Science and Engineering

Sep 2018 - Jun 2021

A member of Intelligent Computing and Application Laboratory

Dalian University of Technology (DUT), China

DUT is one of the top “985 / 211 / Double First-Class” universities in China

Bachelor, Information Management and Information System

GPA Ranking: (5th out of 74)

Sep 2013 - Jun 2017

RESEARCH AREA

Operations Research, Discrete Optimization / Integer Programming

Design of High-efficient Heuristic / Metaheuristic / Intelligent Optimization Algorithm

Supply Chain System Modeling & Optimization

PUBLICATIONS (ONLY LIST ENGLISH JOURNALS AND CONFERENCES)

Yangguang Wang, Huaping Chen, Shengchao Zhou, Chuang Liu*, “An Adaptive Memetic Algorithm with Extended Neighbourhood Search for the Vehicle Routing Problem with Backhauls and Loading Constraints” submitted to **Annals of Operations Research (Major Revision)** (We have received the revision comments, and the paper is now being revised.)

Yangguang Wang, Shengchao Zhou, Zhen Chen, Huaping Chen*, “A High-efficient Meta-heuristic Algorithm for the Vehicle Routing Problem under the Bin-packing, Speed uncertainty, and Maximum Time Duration Constraints” submitted to **European Journal of Operational Research** (Under the 2nd Round of Review)

Chuang Liu*, Yangguang Wang, Xueping Li, Shengchao Zhou, Huaping Chen, “Minimising makespan of multi-drone delivery scheduling in the hexagonal network with dynamic parcel arrivals” submitted to **International Journal of Production Research** (Under Review)

Wang Y., Liu C., Chen H. (2021). An Enhanced Evolutionary Algorithm for the Two-Dimensional Loading Capacitated Vehicle Routing Problem with Mixed Backhauls and Linehauls. In Lecture Notes on Data Engineering and Communications Technologies, 88, (pp.771-782). Springer International Publishing. doi: 10.1007/978-3-030-70665-4_3

RESEARCH WORK OVERVIEW

- Design high-efficient metaheuristic algorithm for solving notorious NP-hard problems, like the vehicle routing problem (VRP) and the two-dimensional / three-dimensional bin packing problem (2L-BPP / 3L-BPP).

- Apply the high-efficient intelligent algorithms to solve more complex and practical supply chain system models, like the cooperative distribution network of UAV and autonomous vehicle.

RESEARCH
PROJECT
& PROGRESS

Succeeded in designing a state-of-the-art metaheuristic algorithm for the well-known **2L-CVRP problem** (Iori et al. [Transportation Science](#)) and finding new best solutions for most of its **benchmark instances**

July, 2019 - Aug, 2021

2L-CVRP (Iori et al. [Transportation Science](#)) is a well-known NP-Hard problem composed of the CVRP and the two-dimensional bin packing problem, which has been studied for 14 years and a lot of work has been published in the related area, including 9 papers published in the *European Journal of Operations Research (EJOR)*.

- I succeeded in designing a high-efficient metaheuristic, called Adaptive Memetic Algorithm with Extended Neighbourhood Search (AMA-ENS), which significantly outperforms the existing state-of-the-art heuristic algorithms for the 2L-CVRP, including SA (Wei et al. [EJOR](#)), VNS (Wei et al. [EJOR](#)), BR-LNS(Dominguez et al. [EJOR](#)), etc., and obtained new best-known solutions (BKS) for most instances of the **2L-CVRP benchmark data set**.

- In addition to the work for the original 2L-CVRP, I also solved two of its more complicated variants. All of the related work has been submitted to *European Journal of Operations Research* and *Annals of Operations Research*.

Challenge the state-of-the-art **SISR algorithm** (Christiaens et al. 2020. [Tansportation Science](#)) for the most famous CVRP problem: we are making progress

July, 2019 - Present

- I found a new clue to improve my algorithm: by recognizing the geometric characteristics of different operators when they work, I removed redundant and time-consuming operators, and allocated the released computing resources to more efficient operators based on geometric recognition.

- I designed geometric insertion operator and destruction reconstruction operator to optimize the search efficiency.

- On the new challenging CVRP benchmark instances ranging from 100 to 1000 customers (Uchoa et al. 2017. [EJOR](#)), my improved algorithm could compete with the **SISR algorithm** (Christiaens et al. 2020. [Tansportation Science](#)). 52 new best solutions are found based on the current BKS level, which is more than the number found by **SISR algorithm**.

Ongoing research work: The optimization of vehicle routing and bin packing for cooperative distribution network of autonomous vehicles and UAVs

July, 2021 - Present

- Constructed a linear programming model considering autonomous vehicles, UAVs, and two-dimensional bin packing.

- Proposed a two-stage algorithm: my previous AMA-ENS is first employed for the routing of the autonomous vehicles; a greedy neighborhood search is then invoked for the path planning of UAVs

OR
ALGORITHM
LIBRARY

A self-developed Operations Research (OR) algorithm library

Nov 2018 - Present

- Covers the mainstream intelligent optimization algorithm for solving a wide class of VRP problems, and two-dimensional / three-dimensional bin packing algorithm.

- Contains a total of more than **30,000 lines** of C++ code.

- All implemented by C++ programming, without use of any third-party algorithm libraries.

SKILLS

Teaching: **Teaching Assistant** for courses “Database Technology and Application”, “Operations Research I, II”, “Probability and Mathematical Statistics”
Programming: **C/C++(proficient)**, Java, Matlab
English Level: **TOEFL 111** (Reading 30, Listening 30, Speaking 23, Writing 28)
