AKANG WANG

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EDUCATION

Carnegie Mellon University (CMU) — Pittsburgh, USA
Doctor of Philosophy in Chemical Engineering (Process Systems Engineering) — *May 2020*
Thesis Title: Optimization Algorithms for Vehicle Routing and Packing Problems
Thesis Committee: Chrysanthos E. Gounaris (advisor), Ignacio E. Grossmann, Nikolaos V. Sahinidis, Willem-Jan Van Hoeve, Alexandre Jacquillat, and Jeffrey E. Arbogast

Tianjin University (TJU) — Tianjin, China
Bachelor of Science in Chemical Engineering — *Jul. 2015*

Nankai University — Tianjin, China
Bachelor of Arts in Finance — *Jul. 2015*

WORK EXPERIENCE

Shenzhen Research Institute of Big Data (SRIBD) — Shenzhen, China
Research Scientist — *Jun. 2021 - Present*

DiDi — Beijing, China
Algorithm Engineer — *Aug. 2020 - Jun. 2021*

RESEARCH EXPERIENCE

Optimization Solver Development Lab, SRIBD — *Jun. 2021 - Present*

Optimization Solver Development

- Team member, Linear Programming Solver Development, SRIBD — *Jun. 2021 - Sept. 2023*
- Team member, Mixed-Integer Linear Programming Solver Development, SRIBD — *Oct. 2022 - Sept. 2024*

Learning to Optimize

- Team member, Theory and Methods of Learning to Optimize and Its Applications to 5G Network, **National Key R&D Program of China** under grant 2022YFA1003900 — *Dec. 2022 - Nov. 2027*
- **Co-PI**, Learning-Enhanced Optimization Algorithms for Large-Scale Mixed-Integer Linear Programs, Huawei — *Sept. 2021 - Sept. 2022*
- Team member, Efficient Primal Heuristics for Mixed-Integer Linear Programs, NeurIPS 2021 ML4CO — *Jul. 2021 - Oct. 2021*

Grid Optimization

- **PI**, Efficient Algorithms and Strong Relaxations for Security-Constrained Alternating Current Optimal Power Flow, **Shenzhen Technological Innovation Talent Program** (start-up fund) under grant RCBS20221008093309021 — *Apr. 2023 - Mar. 2025*

Transportation & Logistics

- Team member, A Hierarchical Decomposition Approach for Railway Disruption Recovery, INFORMS 2022 RAS Problem Solving Competition — *Jul. 2022 - Oct. 2022*

Ph.D. Research, Process Systems Engineering, CMU — *Aug. 2015 - May 2020*

SKILLS

Professional Expertise: Operations Research, Mathematical Optimization
Application Software: CPLEX, Gurobi, SCIP, GAMS
Programming Languages: C, C++, Python, Julia
Languages: Mandarin (native), English (fluent)

PUBLICATIONS

A. Wang, X. Li, J. E. Arbogast, G. Bonnier, and C. E. Gounaris. A novel branch-and-cut algorithm for continuous-time inventory routing. *Ready for Submission*, 2023b

A. Wang, J. E. Arbogast, G. Bonnier, Z. Wilson, and C. E. Gounaris. Estimating the marginal cost to deliver to individual customers. *Optimization and Engineering*, pages 1–39, 2023a

A. Wang, A. Subramanyam, and C. E. Gounaris. Robust vehicle routing under uncertainty via branch-price-and-cut. *Optimization and Engineering*, 23(4):1895–1948, 2022a

A. Wang, N. Ferro, R. Majewski, and C. E. Gounaris. Mixed-integer linear optimization for full truckload pickup and delivery. *Optimization Letters*, 15(6):1847–1863, 2021

A. Wang and C. E. Gounaris. On tackling reverse convex constraints for non-overlapping of unequal circles. *Journal of Global Optimization*, 80(2):357–385, 2021

S. J. Bakker, **A. Wang**, and C. E. Gounaris. Vehicle routing with endogenous learning: Application to offshore plug and abandonment campaign planning. *European Journal of Operational Research*, 289 (1):93–106, 2021

A. Subramanyam, **A. Wang**, and C. E. Gounaris. A scenario decomposition algorithm for strategic time window assignment vehicle routing problems. *Transportation Research Part B: Methodological*, 117:296–317, 2018b

A. Wang, C. L. Hanselman, and C. E. Gounaris. A customized branch-and-bound approach for irregular shape nesting. *Journal of Global Optimization*, 71(4):935–955, 2018b

PROCEEDINGS

Q. Han, L. Yang, Q. Chen, X. Zhou, D. Zhang, **A. Wang**, R. Sun, and X. Luo. A gnn-guided predict-and-search framework for mixed-integer linear programming. *arXiv*, 2023

M. Gasse, ..., **A. Wang**, et al. The machine learning for combinatorial optimization competition (ml4co): Results and insights. *Proceedings of the NeurIPS 2021 Competitions and Demonstrations Track*, PMLR 176:220–231, 2022

A. Wang, L. Yang, S. Lai, X. Luo, X. Zhou, H. Huang, S. Shao, Y. Zhu, D. Zhang, and T. Quan. Efficient primal heuristics for mixed-integer linear programs. *arXiv*, 2022c

A. Wang, A. Subramanyam, and C. E. Gounaris. A branch-price-and-cut algorithm for robust vehicle routing under demand uncertainty. *Proceedings of the TSL Second Triennial Conference*, 2020b

PRESENTATIONS

A. Wang, L. Wang, X. Zhou, D. Zhang, and X. Luo. A hierarchical decomposition approach for railway disruption recovery. *INFORMS Annual Meeting*, 2022b

A. Izadkhah, **A. Wang**, J. M. Lainez-Aguirre, J. M. Pinto, and C. E. Gounaris. Workload balancing in periodic distribution scheduling and routing optimization. *INFORMS Annual Meeting*, 2022

L. Yang, S. Lai, **A. Wang**, X. Luo, X. Zhou, H. Huang, S. Shao, Y. Zhu, and D. Zhang. Efficient primal heuristics for mixed-integer linear programs. *NeurIPS Annual Conference*, 2021

A. Izadkhah, **A. Wang**, J. M. Lainez-Aguirre, J. M. Pinto, and C. E. Gounaris. Periodic vehicle routing with trips spanning multiple days. *INFORMS Annual Meeting*, 2021

A. Wang, A. Subramanyam, and C. E. Gounaris. A branch-price-and-cut approach for robust vehicle routing. *INFORMS Annual Meeting*, 2020a

A. Wang, X. Li, J. E. Arbogast, G. Bonnier, and C. E. Gounaris. A branch-and-cut algorithm for continuous-time inventory routing. *INFORMS Annual Meeting*, 2019d

A. Wang, J. E. Arbogast, G. Bonnier, Z. Wilson, and C. E. Gounaris. Estimation of marginal cost to serve individual customers. *INFORMS Annual Meeting*, 2019b

V. A. Silva, C. E. Gounaris, and **A. Wang**. Routing of platform supply vessels in offshore oil and gas logistics. *INFORMS Annual Meeting*, 2019 (Poster)

A. Wang, X. Li, J. E. Arbogast, G. Bonnier, and C. E. Gounaris. A branch-and-cut algorithm for continuous-time inventory routing. *AIChE Annual Meeting*, 2019c

A. Wang, J. E. Arbogast, G. Bonnier, Z. Wilson, and C. E. Gounaris. Estimation of marginal cost to serve individual customers. *AIChE Annual Meeting*, 2019a

A. Wang and C. E. Gounaris. A customized branch-and-bound approach for circle packing. *INFORMS Annual Meeting*, 2018b

A. Wang, C. L. Hanselman, and C. E. Gounaris. A novel branching scheme for problems with reverse convex quadratic constraints and its application to packing problems. *AIChE Annual Meeting*, 2018a

A. Wang and C. E. Gounaris. Solving robust vehicle routing via a branch-price-and-cut approach. *AIChE Annual Meeting*, 2018a

A. Subramanyam, **A. Wang**, and C. E. Gounaris. Strategic time window assignment in vehicle routing operations. *AIChE Annual Meeting*, 2018a

A. Wang, C. L. Hanselman, and C. E. Gounaris. Irregular shape nesting via branch-and-bound using custom relaxations. *INFORMS Annual Meeting*, 2017

A. Wang and C. E. Gounaris. A branch-price-and-cut approach for robust vehicle routing. *INFORMS Annual Meeting*, 2017

HONORS & AWARDS

2^{nd} place in the 2022 RAS Problem Solving Competition, INFORMS *Oct. 2022*
1^{st} place in ML4CO NeurIPS 2021 competition (Primal Task) *Nov. 2021*
Overseas High-Caliber Personnel (Level C), Human Resources and Social Security Administration of Shenzhen Municipality *Oct. 2021*
H. William and Ruth Hamilton Prengle Graduate Fellowship, CMU *Apr. 2018*
James C. Meade Graduate Fellowship, CMU *Dec. 2016*
Institutional Honor, TJU *Jun. 2015*
Shanghai Pudong Development Bank Endeavour Fellowship, TJU *Dec. 2014*
National Scholarship, TJU *Nov. 2013*
Shanghai Pudong Development Bank Scholarship, TJU *Dec. 2012*

PROFESSIONAL SERVICE

Journal reviewer: *Integer Programming and Combinatorial Optimization* (subreviewer), *European Journal of Operational Research*, *Transportation Research Part C*, *Networks*, *Optimization Letters*, *Optimization and Engineering*, *IEEE Transactions on Neural Networks and Learning Systems*
Conference session chair: *INFORMS Annual Meeting 2018/2019*
Conference organizing committee: *YinzOR 2019*

TEACHING EXPERIENCE

Teaching Assistant, CMU *Jan. 2016 - May 2020*

- Optimization Modeling and Algorithms, Chemical Process Systems Design, Special Topics in Process Systems Engineering (CMU courses for undergraduate and graduate students)
- Models and Algorithms for Supply Chain Optimization (CAPD short course for industrial participants)