AKANG WANG

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EDUCATION

Carnegie Mellon University   Pittsburgh, PA
Doctor of Philosophy in Chemical Engineering   *May 2020*
Thesis advisor: Chrysanthos E. Gounaris
GPA: 3.95/4.00

Tianjin University   Tianjin, China
Bachelor of Science in Chemical Engineering   *Jul. 2015*

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

RESEARCH EXPERIENCE

Ph.D. Research, Process Systems Engineering, Carnegie Mellon University   *Sept. 2015 - Present*

Supply Chain Optimization

– Implemented tailored branch-price-and-cut algorithms to exactly solve several variants of vehicle routing problems (time windows, multiple trips, heterogeneous fleets, multiple periods, uncertain demands) and closed numerous previously open benchmark instances

– Established a scenario-sampling framework to estimate the marginal cost of serving individual customers and delivered C++ codes to Air Liquide for commercial use

– Proposed a novel branch-and-cut algorithm for solving the continuous-time inventory routing problem that arises in the industrial gas business (e.g., Air Liquide) and obtained superior results over the state-of-the-art approach

– Built a novel mixed-integer linear programming model for the full truckload pickup and delivery problem and demonstrated its effectiveness and efficiency through extensive computational studies on industrial data from Braskem

Global Optimization

– Developed a customized branch-and-bound approach for irregular shape nesting and solved five-polygon nesting instances to global optimality for the firsts time in literature

– Incorporated strengthened intersection cuts to deal with reverse convex quadratic constraints and achieved superior computational performance over the state-of-the-art global solvers on solving circle-packing instances

SKILLS

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

PUBLICATIONS

S. Bakker, **A. Wang**, and C. E. Gounaris. Vehicle routing with endogenous learning effect: an application to offshore plug and abandonment campaign planning. *In Preparation*, 2019

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

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

A. **Wang** and C. E. Gounaris. On tackling circle-circle non-overlapping constraints. *In Preparation*, 2019

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, 2018

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

S. Shi, L. Wang, **A**. **Wang**, R. Huang, L. Ding, R. Su, W. Qi, and Z. He. Bioinspired fabrication of optical fiber spr sensors for immunoassays using polydopamine-accelerated electroless plating. *Journal of Materials Chemistry C*, 4(32):7554–7562, 2016

PRESENTATIONS

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*, 2019c

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

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

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**, 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

H. William and Ruth Hamilton Prengle Graduate Fellowship, Carnegie Mellon University	*Apr. 2018*
James C. Meade Graduate Fellowship, Carnegie Mellon University	*Dec. 2016*
Institutional Honor, Tianjin University	*Jul. 2015*
National Scholarship, Tianjin University	*Dec. 2013*

PROFESSIONAL SERVICE

Journal reviewer: *Optimization Letters*, *Optimization and Engineering*, *Integer Programming and Combinatorial Optimization 2019* (subreviewer)
Conference session chair: *INFORMS Annual Meeting 2018, INFORMS Annual Meeting 2019*
Conference organizing committee: *YinzOR 2019*

TEACHING EXPERIENCE

Teaching Assistant, Carnegie Mellon University *Jan. 2016 - May 2019*
– 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)