Akang Wang

General Information

Nationality: People's Republic of China   Languages: Mandarin (native), English (fluent)
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Education

Ph.D., Chemical Engineering, Carnegie Mellon University, Pittsburgh, PA *Sept. 2015 - present*
- Thesis Title: "Optimization Algorithms for Vehicle Routing under Uncertainty and Packing Problems"
- Thesis Advisor: Chrysanthos E. Gounaris
- GPA: 3.94/4.00

B.S., Chemical Engineering, Tianjin University, Tianjin, China *Sept. 2011- Jul. 2015*
- Thesis Title: "The Bioinspired Fabrication, Modification and Application of Fiber-Optical SPR Sensors"
- Thesis Advisor: Rongxin Su
- GPA: 3.85/4.00

B.A., Finance, Nankai University, Tianjin, China *Mar. 2013- Jul. 2015*
- Thesis Title: "The Study on Diversification of China's Foreign Exchange Reserve"
- Thesis Advisor: Fenglong Gao

Research Experience

Ph.D. Research, Carnegie Mellon University, Chrysanthos E. Gounaris *Sept. 2015 – present*

A Customized Branch-and-Bound Approach for Irregular Shape Nesting
- Developed a novel branching scheme to deal with reverse convex quadratic constraints
- Utilized feasibility-based and optimality-based model tightening techniques
- Solved five-polygon nesting problems to global optimality for the first time in literature

A Branch-Price-and-Cut Approach for Robust Vehicle Routing
- Developed sophisticated Branch-Price-and-Cut codes for vehicle routing problems
- Proposed to add robust rounded capacity inequalities to guarantee robust feasibility
- Obtained comparable results with the Branch-and-Cut approach

A Customized Branch-and-Bound Approach for Circle Packing
- Employed a branching strategy on circle-circle non-overlapping constraints
- Incorporated intersection cuts in order to tighten the linear relaxation
- Applied problem-specific feasibility and optimality-based model tightening
- Achieved superior computational performance over state-of-the-art global solvers

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*
Shanghai Pudong Development Bank Endeavour Fellowship, Tianjin University   *Dec. 2014*
National Scholarship, Ministry of Education of the People's Republic of China   *Dec. 2013*
Shanghai Pudong Development Bank Scholarship, Tianjin University   *Dec. 2012*

Publications

Subramanyam, A., **Wang, A.**, Gounaris, C.E., 2.18. A Scenario Decomposition Algorithm for Strategic Time Window Assignment Vehicle Routing Problems. *Transportation Research Part B: Methodological*, 117, pp296-317.

Wang, A., Hanselman, C.L. and Gounaris, C.E., 2018. A customized branch-and-bound approach for irregular shape nesting. *Journal of Global Optimization*, pp.1-21.

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

Presentations

Wang, A., Hanselman, C.L., Gounaris, C.E., "Irregular Shape Nesting via Branch-and-Bound Using Custom Relaxations," INFORMS 2017 Annual Meeting, Oct. 25, 2017.

Wang, A., Gounaris, C.E., "A Branch-Price-and-Cut Approach for Robust Vehicle Routing", INFORMS 2017 Annual Meeting, Oct. 24, 2017.

Wang, A., Gounaris, C.E., "Branch-Price-and-Cut for Distribution via Heterogeneous Fleets," Enterprise-Wide Optimization Meeting, Sept. 20, 2016. Poster.

Teaching Experience

Teaching Assistant, Carnegie Mellon University   *Jan. 2016 – May. 2018*
– *Optimization Modeling and Algorithms:* helped undergraduate students understand basic concepts and theories in optimization
– *Chemical Process Systems Design:* managed 5 groups of senior-year students and gave guidance for projects
– *Special Topics in Process Systems Engineering:* assisted graduate students in course projects related to meta-heuristics and mathematical modeling
– *Models and Algorithms for Supply Chain Optimization (CAPD short course):* prepared programming exercises and answered modeling questions about supply chain logistics

Skills

Mathematical Optimization, Operations Research, Machine Learning, CPLEX, GAMS, C++, Python