

# Zefeng Lyu

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## EDUCATION

### University of Tennessee, Knoxville

Ph.D. in Industrial and Systems Engineering with a minor in Computer Science

Knoxville, United States

August 2018 - December 2023

### Zhejiang University of Technology

B.S. in Industrial Engineering

Zhejiang, China

August 2013 - June 2017

## WORK EXPERIENCE

### Graduate Research Assistant

University of Tennessee, Knoxville

#### Project 1: Crack Identification with Drones for Airport Pavements

August 2018 - Current

- Collaborated with the Tennessee Department of Transportation - Aeronautics Division to develop solutions for crack identification and measurement in airport pavements.
- Assisted in data collection using drones.
- Developed and implemented a deep learning model for accurate and efficient crack identification.
- Presented research results in weekly meetings.

#### Project 2: Culvert Maintenance and Workforce Scheduling

- Collaborated with the Tennessee Department of Transportation - Maintenance Operations Division to enhance culvert maintenance operations through optimization modeling.
- Assisted in data collection and analysis, ensuring the accuracy and reliability of the model.
- Developed an optimization model for efficient culvert maintenance scheduling, considering factors such as workforce availability and resource allocation.
- Designed visualization tools to aid decision-making processes for maintenance supervisors.

### Graduate Teaching Assistant

University of Tennessee, Knoxville

Teaching Assistant

August 2019 - Current

- Created and graded homework, quizzes, and projects for undergraduate and graduate courses.
- Conducted lab courses, providing guidance and support to students.
- Offered office hours to address students' questions and concerns.

## PEER-REVIEWED PUBLICATIONS

1. **Lyu, Z.**, Islam M. Z., Yu, A. J., "A Scalable and Adaptable Supervised Learning Approach for Solving the Traveling Salesman Problems," to be submitted.
2. **Lyu, Z.** and Yu, A. J., "The pickup and delivery problem with transshipments: Critical review of two existing models and a new formulation," *European Journal of Operational Research*, DOI: <https://doi.org/10.1016/j.ejor.2022.05.053>, Vol. 305, 2022.
3. **Lyu, Z.**, Liu, Z., Khojandi, A., Yu, A. J., "Q-learning and traditional methods on solving the pocket Rubik's cube," *Computers and Industrial Engineering*, DOI: <https://doi.org/10.1016/j.cie.2022.108452>, Vol. 171, 2022.
4. **Lyu, Z.** and Yu, A. J., "Consultant assignment and routing problem with priority matching," *Computers and Industrial Engineering*, DOI: <https://doi.org/10.1016/j.cie.2020.106921>, Vol. 151, 2021.

## CONFERENCE PROCEEDINGS

1. **Lyu, Z.**, Starr, C., and Yu, A. J., "The Culvert Maintenance planning and scheduling problem: a mathematical formulation to optimize resource utilization", accepted by the Proceedings of the 50th International Conference on Computers and Industrial Engineering, 2023.
2. **Lyu, Z.** and Yu, A. J., "A Three-stage Heuristic for the Pickup and Delivery Problem with Occasional Drivers and Transshipment," Proceedings of IISE the Annual Conference and EXPO, May 22-25, 2021.
3. **Lyu, Z.** and Yu, A. J., "Hybrid multi-stage algorithm for a multi-depot consultant assignment and routing problem," Proceedings of the 49th International Conference on Computers and Industrial Engineering, Beijing, China, October 18-21, 2019.

## CONFERENCE PRESENTATIONS

1. **Lyu, Z.** and Yu, A. J., "Culvert Maintenance Planning for Tennessee Department of Transportation," IISE Annual Conference and Expo 2023, New Orleans, May 20 - May 23, 2023.
2. **Lyu, Z.** and Yu, A. J., "A Learning-based Adaptive Neighborhood Search Algorithm for Pickup and Delivery Problem with Transshipment and Occasional Drivers," IISE Annual Conference and Expo 2022, Seattle, May 21 - May 24, 2022.

3. **Lyu, Z.** and Yu, A. J., “The Pickup and Delivery Problem with Time Windows and Transshipments,” 2021 INFORMS (Institute for Operations Research and Management Science) Conference, Anaheim, CA, October 24-27, 2021
4. **Lyu, Z.** and Yu, A. J., “A Three-stage Heuristic for Pickup and Delivery Problem with Occasional Drivers and Transshipment,” IISE Annual Conference and EXPO 2021, Virtual, May 22 – May 25, 2021.
5. **Lyu, Z.** and Yu, A. J., “Multi-vehicle multi-objective pickup and delivery problem for emergency supplies,” 2020 INFORMS (Institute for Operations Research and Management Science) Conference, Virtual, November 7-13, 2020.
6. **Lyu, Z.** and Yu, A. J., “Dynamic Redesign of Material Flow Network in Flexible Manufacturing Systems,” IISE Annual Conference and EXPO 2020, Virtual, May 30 – June 2, 2020.

## SKILLS

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**Programming** Python (Gurobipy, Tensorflow, Scikit-learn, TSPLIB 95, Networkx, Pandas, NumPy), C/C++, SQL, R  
**Optimization** Meta-heuristics(Neighborhood Search, Genetic Algorithm, Simulated Annealing, etc.), Exact methods, Heuristics

## PATENTS

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**Zefeng Lyu**, Lianqiang Fang, Junyang Chen, Pen Gong, Shen Li, Hao Ding, Yaojie Cai, “Folding mechanism for carton”, China Patent Application 201620528438.1, June, 2016.

Junyang Chen, Lianqiang Fang, **Zefeng Lyu**, Shen Li, Pen Gong, Hao Ding, Yaojie Cai, “Weighting device for bulk cargo”, China Patent Application 201620528435.8, 2017.

## AWARDS

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|------|---|----------------------|
| 2021 | <b>Lloyd W. Crawford Fellowship</b> , University of Tennessee Knoxville                     | <i>United States</i> |
| 2018 | <b>Second Prize, 13th College Student Mechanical Design Competition</b> , Zhejiang Province | <i>China</i>         |
| 2015 | <b>Provincial Government Scholarship</b> , Zhejiang Province                                | <i>China</i>         |