Qiong Hu

Curriculum Vitae

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Employment

University of Colorado Denver — **Denver, CO**
Clinical Assistant Professor in Business Analytics — *Mar. 2023 – Present*

University of Colorado Denver — **Denver, CO**
Instructor in Business Analytics — *Aug. 2021–Feb. 2023*

GUOYUAN Agricultural Insurance Co. — **HuangShan, China**
Customer Quality Specialist — *July 2011–June 2014*

Education

○ **Auburn University** — **Auburn, AL**
  Ph.D., Industrial & Systems Engineering — Aug. 2016–Aug. 2021
  Area of Study: Operations Research, Data Analytics
  GPA: 4/4

○ **Auburn University** — **Auburn, AL**
  M.S., Industrial & Systems Engineering — Aug. 2014–Dec. 2015
  Area of Study: Operations Research
  GPA: 3.92/4

○ **Anhui University of Technology** — **Maanshan, China**
  B.S., Logistics Engineering — Aug. 2007–May 2011
  Area of Study: Shortest Path Problem, Logistics Center Selection

Research Interests

Vehicle Routing and Scheduling Problems, Dynamic Programming, Machine Learning & Deep Learning, Data Analytics, Text Mining, Discrete-event Simulation

Teaching Experience

Instructor — **University of Colorado Denver**
BANA 2010: Business Statistics — *2021-2023*
Evaluation: 4.6/5
BUSN 6530: Data Analytics for Managers — *2022, 2023*
Evaluation: 4.6/5

Instructor — **Auburn University**
BUAL 2650: Business Analytics II — *Summer 2021*
STAT 3610: Probability and Statistics II — *Summer 2018, 2019*
Evaluation: 5.9/6

Teaching Assistant — **Auburn University**
BUSI 7120: Quantitative Analysis for Business Decisions — *Fall 2020*
BUAL 2600: Business Analytics I — *Summer 2020*
BUAL 2650: Business Analytics II — *Summer 2020, Spring & Summer 2021*
INSY 3400: Stochastic Operations Research — *Fall 2016–2020*
INSY 5600/6600/6606: Manufacturing and Production Economics — *Spring 2018–2020*
INSY 7420/7426: Linear Programming & Network Flows — *Spring 2017, 2021*

Research Experience

Applied text mining method to analyze patients' survey results
○ *Utilized BERT topic modeling to analyze the patients' reviews to improve the questionnaire design*
○ *Performed sentimental analysis based on BERT model to enhance the medical service*
Created prescriptive and predictive transportation safety models

- *Developed transportation network modeling for truck drivers by implementing data mining tools*
- *Built bi-objective optimization models that incorporated the k-shortest path algorithm and Pareto ranking to present non-dominated solutions*
- *Modeled linear, non-linear, and mixed integer optimization problem in vehicle routing and scheduling problem using AMPL*
- *Built dynamic decision-making model incorporating the risk estimation to improve driver's safety*
- *Utilized ten machine learning methods in analyzing the safety-related critical events*

Implemented inverse reinforcement learning to model driver-behavior
Performed inverse reinforcement learning in extracting the utility function to quantify the driver's risk

Built fatigue failure model to reduce work-related musculoskeletal disorders
Conceptualized the lower back risk in optimization model; developed the job-rotation model to reduce the worker's lower back risk by using the integer programming and mix integer programming

Developed models and simulation to improve the production process
Utilized Simio to demonstrate the production system and improved the production efficiency

Publications

[1] **Hu, Q.**, et al. "A review of data analytic applications in road traffic safety. Part 2: prescriptive modeling." Sensors 20.4 (2020): 1096.

[2] Mehdizadeh, A., Vinel, A., **Hu, Q.**, Schall Jr, M. C., Gallagher, S., Sesek, R. F. (2020). Job rotation and work-related musculoskeletal disorders: a fatigue-failure perspective. Ergonomics, 63(4), 461-476.

[3] Mehdizadeh, A., M., Cai, **Hu, Q.**, Mohabbati, N., Yazdi, M., Vinel, A., Rigdon, S., Davis, K., Megahed, F., "Bridging the Gap between Optimization and Statistical Modeling of Large Truck Safety: A Review – Part 1: Data Collection, Exploration Predictive Modeling", Sensors 20.4 (2020): 1107.

[4] Cai, M., Yazdi, M. A. A., Mehdizadeh, A., **Hu, Q.**, Vinel, A., Davis, K., Megahed, F., Rigdon, S. E. (2021). The association between crashes and safety-critical events: Synthesized evidence from crash reports and naturalistic driving data among commercial truck drivers. *Transportation Research Part C: Emerging Technologies, 126, 103016.*

[5] Mehdizadeh, A., Yazdi, M., Cai, M., **Hu, Q.,** Vinel, A., Rigdon, S., Davis, K., Megahed F., "Predicting unsafe driving events among commercial truck drivers: Lessons learned from the surveillance of 20 million driving miles using IoT sensors ", *Accident Analysis & Prevention 159 (2021): 106285.*

[6] Tang, X., Huang, X., Zhang, W., Child, T., **Hu, Q.,**, Liu, Z., Zhang, J., "Cognitive visual commonsense reasoning using dynamic working memory." *arXiv preprint arXiv:2107.01671 (2021).*

[7] Cai, M., Mehdizadeh, A., **Hu, Q.**, Alamdar Yazdi, M. A., Vinel, A., Davis, K. C., Rigdon, S. E. (2022). Hierarchical point process models for recurring safety critical events involving commercial truck drivers: A reliability framework for human performance modeling. Journal of Quality Technology, 54(4), 466-484.

Submitted papers
[1] **Hu, Q.**, Mehdizadeh, A., Vinel, A., Cai, M., Rigdon, S., Megahed, F."Vehicle routing problems with driving risk objective", submitted to *Transportation Research Record*

[2] **Hu, Q.**, Vinel, A., Cai, M., Rigdon, S., Xu, L., Megahed, F.."A dynamic programming model for transportation problems with safety criteria", submitted to *4OR Journal*

[3] Li, W., Zhu, K., Liu, E., Peng, W., Fang, C., **Hu, Q.**, Cai, M.."Association between the convergence development of healthcare service industry and public health performance: a geospatial modeling study of panel provincial data from China", submitted to *Frontiers in Public Health*

In preparation
[1] **Hu, Q.**, Mehdizadeh, A., Vinel, A., "Comparison Between Inverse Reinforcement Learning and Statistical Methods in Estimating the Driver's Risk".

Continuous Teaching Improvement

- **The Association of College and University Educators(ACUE), Summer, 2022**
  Completed the ACUE Course on designing Learner-Centered and Equitable Courses
- **The Association of College and University Educators(ACUE), Fall, 2022**
  Completed the ACUE Course on Inspiring Inquiry and Preparing Livelong Leaner

Conference Presentations

- **INFORMS Annual Meeting, Phoenix, Arizona, 2018**
  "A Real-Time Dynamic Model for Vehicle Routing Problem with Safety Criteria"
- **INFORMS Annual Meeting, Seattle, Washington, 2019**
  "The Application of Inverse Reinforcement Learning to Improve Driver's safety"
- **INFORMS Annual Meeting, Indianapolis, IN, 2022**
  "Modeling Driver-behavior Based on Inverse Reinforcement Learning"

Honors and Awards

National(USA)

- *2021 Ergonomics Journal Best Paper Award: Amir Mehdizadeh, Alexander Vinel, Qiong Hu, Mark C. Schall Jr., Sean Gallagher Richard F. Sesek (2020), Job rotation and work-related musculoskeletal disorders: a fatigue-failure perspective, Ergonomics, 63:4, 461-476*
- *INFORMS 2018 Student Chapter Annual Award at the level of Cum Laude*
- *INFORMS 2017 Student Chapter Annual Award at the level of Summa Cum Laude*

Auburn University

- *2019 Dr. Saeed Maghsoodloo Annual Assistantship in recognition of excellence in teaching and leadership, Industrial and Systems Engineering Council, $12,000*
- *2019 Travel Fund from Graduate School, $400*
- *2018 Travel Fund from Graduate School, $400*
- *2017 Certificate of Distinguished Future Faculty from Graduate School*
- *2016 Travel Grant for INFORMS Annual Meeting, ISE Dept., $500*

Technical and Personal skills

- **Optimization:** AMPL, Guropi
- **Computer Programming:** Python, Matlab
- **Statistical Analysis:** R, SAS, Minitab, JMP Pro
- **Database Management:** MySQL, MongoDB
- **Simulation:** Simio
- **Project Management:** Microsoft Project
- **Learning Management System:** Canvas
- **Design:** AutoCAD

Professional Service

- **Peer Reviewer**
  Transportation Research Record, Frontiers in Physics, Computational Intelligence and Neuroscience, IEEE 2021 International Conference on Machine Learning and Applications.
- **GRAND Engineer Showcase** **Auburn University**
  Collaborated with at least 20 engineering students with set-up, directing attendees, registration and experiments. Fall 2019
- **INFORMS Student Chapter** **Auburn University**
  E–council Representative: Coordinated activities between university and INFORMS. 2016-2018
- **Women in Science and Engineering(WISE)** **Auburn University**
  Volunteered in Junior Mad Scientist Day; Introduced Optimization concept to 5-11 years old children using fun scientific games. 2016-2018