HEIDER AL MASHALAH

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Education

PhD in Computational Science and Engineering **Jan. 2021 – May 2026**
McMaster University, Ontario, Canada
- Specialized in supply chain management.
- Description: Behavioural data-driven models in operations research and last mile delivery.
- Relevant Courses: Mathematical Modelling, Applied Multivariate Statistics, Data Science, Optimization and Machine Learning with Big Data, Mathematical Programming: Theory and Algorithms, and Stochastic Processes for Business Applications.

Master of Applied Science in Industrial Systems Engineering **Sep. 2016 - 2019**
University of Regina, Saskatchewan, Canada
- Description: Study the impact of emergency department occupancy rate on patients' health conditions.
- Relevant Courses: Numerical Methods, Business Analysis, Operations Management.

Undergraduate exchange student **Sep. 2012- 2013**
Technical University of Berlin, Berlin, Germany

Bachelor of Industrial Systems Engineering **Sep. 2009 - 2014**
Mutah University, Alkarak, Jordan

Research experience

Research Coordinator **Jan. 2020 – Present**
Smart Freight Centre, McMaster University, Ontario, Canada
- Coordinate multiple research projects and liaise with municipal, provincial, and federal government agencies to identify potential research opportunities.
- Design and manage surveys and interviews on freight transportation, travel and shopping behaviour, food access and secure ethical approvals and privacy protections for sensitive data.
- Organize events such as workshops, meetings and the annual Smart Freight Symposia.
- Coordinate research staff efforts, manage event volunteers and optimize budgets and resources to ensure adherence to project timelines and requirements.
- Develop data-driven models for supply chain planning projects such as for cross-border total logistics, policies for establishing foreign trade zones; last mile delivery for omni-channels analyz consumer behavior during disruptions to optimize supply chain decisions.
- Organize and maintain media outreach including projects' websites, newsletter and LinkedIn page.
- Participate in establishing freight data repository to streamline logistics analysis and enable data-driven decision-making.
- Coordinate training program on freight transportation analytics including instructor communication and logistics, marketing campaign development, and credentials management.

Research Assistant **Aug. 2016 –2019**
Saskatchewan Health Quality Council, Saskatchewan, Canada
- Collected and analyzed health data to support evidence-based decisions on service delivery and quality improvement.
- Assisted with reports and presentations that communicated findings to policy and clinical stakeholders.

Teaching experience

SAP Trainer (SAP University Alliance) **2016**
German Jordanian University, Amman, Jordan
- Delivered an intensive 15-day SAP Project Manager certification boot camp for 50 students, covering the full project lifecycle within the SAP ecosystem.

- Facilitated hands-on training as part of the SAP University Alliance, bridging the gap between academic theory and industry-standard ERP tools.

Lab Supervisor **Feb. 2015 –2016**

German Jordanian University, Amman, Jordan

- Operations Research: Taught laboratory sessions through practical case studies, covering mathematical modeling and solver implementation using CPLEX. Topics included Facility Location, Vehicle Routing, Production Planning, and Supply Chain Network Design.
- Student Mentorship: Guided students through final projects, providing technical support on model formulation and debugging.
- Material Science & Manufacturing: Supervised laboratory experiments focusing on material properties (tensile, hardness, impact testing) and manufacturing processes
- Applied Probability and Statistics: Conducted tutorials for probability and statistics courses, clarifying concepts in hypothesis testing, ANOVA, and regression analysis.

Publications

Peer-Reviewed articles

- Al Mashalah, H., Hassini, E., Gunasekaran, A., & Bhatt, D. (2022). The impact of digital transformation on supply chains through e-commerce: Literature review and a conceptual framework. *Transportation Research Part E: Logistics and Transportation Review,* 165, 102837.
- Al Mashalah, H., Hassini, E., & Mishra, D. (2025). How Do Disruptions and Last-Mile Delivery Logistics Affect Shopping Behaviour?. *Operations and Supply Chain Management: An International Journal*, 18(4), 600-616.

Articles submitted

- Masuduzzaman, M., Hassini, E., Rahaman, M. F., and Al Mashalah, H. (submitted). FreshTrack: An innovative IoT sensor driven food freshness estimation framework integrating blockchain. Manuscript submitted to *Scientific Reports*.
- Mishra, D. B., Hassini, E., Mishra, A., Al Mashalah, H., and Cheng, T. C. E. Unveiling the power duo: Business strategy and big data for supply chain planning. Manuscript submitted to *Transportation Research Part E: Logistics and Transportation Review*.

Working papers

- Al Mashalah, H., and Hassini, E. Behavioural data driven locations for strategic planning. DeGroote School of Business, McMaster University.
- Al Mashalah, H., and Hassini, E. Greening the gridlock: Strategic fleet decarbonization with social equity. DeGroote School of Business, McMaster University.
- Masuduzzaman, M., and Al Mashalah, H. Reinforcement Learning for Autonomous Delivery Routing. DeGroote School of Business, McMaster University.

Conference participations

- Al Mashalah, H., and Hassini, E. (2026). Data Driven Parcel Locker Locations. Submitted to the *17th World Conference on Transport Research WCTR 2026*, Toulouse, France.
- Masuduzzaman, M., Hassini, E., and Al Mashalah, H. (2025). IoT Sensor Integrated Smart Food Freshness Scoring System. *In Proceedings of the 2025 IEEE 9th Forum on Research and Technologies for Society and Industry (RTSI) (pp. 197–201). IEEE*.
- Al Mashalah, H., and Hassini, E. (2025). Parcel lockers allocation with distance sensitive demand. *66th Canadian Operational Research Society Conference 2025*, Edmonton, Canada.
- Bhatt, D., Hassini, E., and Al Mashalah, H. (2022). Harnessing the power of big data toward the development of big data strategy. *63rd Canadian Operational Research Society Conference 2022*, Edmonton, Canada.

Business reports

- Post-Pandemic E-Commerce Impacts on Supply Chain and Communities (2023) – Business Report.
- Assess Region of Peel's National Role and Importance in Freight Fluidity (2021) – Business Report.

Case study

Al Mashalah, H., Bakhtiari, B., and Hassini, E. 2025. Tariffs, transformers, and strategic trade risk for Canadian electrical steel industry. Teaching case study in preparation for submission to Ivey Publishing, DeGroote School of Business, McMaster University.

Symposia participations

Presentations

- Al Mashalah, H. (2023). The technology and tellings of facial recognition. Presentation at *the Truck Training Schools Association of Ontario 30th Anniversary conference*, Ontario, Canada.
- Al Mashalah, H. (2020). E commerce logistics impacts on communities. Presentation at *the 2nd Smart Freight Centre Symposium* hosted by York University, Toronto, Canada, online.
- Al Mashalah, H. (2020). Updates on McMaster University research. Presentation at *the 2nd Smart Freight Centre Symposium* hosted by York University, Toronto, Canada, online.

Posters

- Al Mashalah, H. and Hassini, E. (2025). Greening urban delivery through equitable fleet planning. Poster presented at the *2025 Graduate Research Symposium*, McMaster University, Hamilton, Canada.
- Al Mashalah, H. and Hassini, E. (2025). Logistics of net zero delivery zones. Poster presented at the *2025 Purolator Innovation Showcase*, Toronto, Canada.
- Al Mashalah, H. and Hassini, E. (2025). Integrating the voice of customers in locating parcel lockers. Poster presented at *the Institute of Transportation Engineers Southwestern Chapter mini conference,* Ontario, Canada.
- Al Mashalah, H. and Hassini, E. (2025). Integrating the voice of customers in locating parcel lockers. Poster presented at *the 2025 City Logistics for the Urban Economy Symposium*, University of Toronto, Toronto, Canada.
- Al Mashalah, H. and Hassini, E. (2024). Data driven location of automated parcel lockers. Poster presented at the *2024 Purolator Innovation Showcase*, Toronto, Canada.
- Al Mashalah, H. and Hassini, E. (2024). Understanding shopper perceptions of last mile deliveries during disruptions: A machine learning approach for quasi longitudinal survey data. Poster presented at *the 2024 City Logistics for the Urban Economy Symposium*, University of Toronto, Toronto, Canada.

Awards and recognition

- Societal Impact Pitch Award shortlisted, McMaster University, 2024
- McMaster University Doctoral Scholarship, 2023 to present
- Traineeship in Health Data Analytics, Saskatchewan Health Quality Council, 2016 to 2019
- Energy Harvesting Tile Using Piezoelectricity project, Samsung Levant, 2014 to 2018
- Academic Excellence Trophy, Pro Train Academy, 2014
- Erasmus Mundus Scholarship, European Union, 2012
- Five awards for highest GPA, Mutah University, 2009 to 2014
- King Abdullah II Fund for Excellence, King Abdullah II Center for Excellence, 2009 to 2014

Media coverage

- TruckNews.com. (2023). Trucking can benefit from neuroscience and digital transformation. Interview.
- International Federation of Operational Research Societies IFORS News. (2022). Third annual Smart Freight Symposium in Canada and online. Newsletter article.
- Jordan TV News and Roya News. (2018). Energy harvesting tile project at Mutah University. News reports.

Analytical and technical skills

Empirical modelling

Experience with quantitative and qualitative empirical research using large-scale stated preference surveys, cross-sectional surveys, quasi-longitudinal survey designs, and semi-structured and in-depth interviews. Managed the full survey lifecycle from concept design, questionnaire development, programming, and ethics clearance to data cleaning, weighting, statistical analysis, and dissemination. Applied multivariate statistics, including structural equation modelling and path analysis, and integrated thematic qualitative insights with quantitative and spatial analysis to explain patterns in shopping behaviour, location preferences, service use, and delivery behaviour. Proficient with SurveyMonkey, Qualtrics, and LimeSurvey.

Optimization
Formulated and implemented optimization models for facility location, fleet planning, and allocation problems in supply chains and last-mile delivery. Used Mixed-Integer linear and non-linear Programming and developed large-scale matheuristics to design decision support tools for partners and to study trade-offs between cost, service, and equity.
Data analytics
Applied supervised and unsupervised machine learning methods and other AI-based analytics for prediction, segmentation, and pattern detection on high-volume datasets. Worked on analytical settings that combine survey responses, telematics data, transactional logs, and spatial indicators to support decision-making and policy analysis, with a strong focus on model interpretability and robustness.
Worked with telematics and logistics data (vehicles, routes, travel times), consumer behaviour survey data regarding e-commerce and last-mile delivery, transactional and operational records, and spatial data covering accessibility, land use, and environmental indicators.
Proficient in Python, R, MATLAB, SQL, SPSS, SAS, ArcGIS Pro, Power BI, Tableau, CPLEX, GAMS, Gurobi, Siemens Tecnomatix Plant Simulation, MS Office, Google Suite (including BigQuery), and LaTeX.
Certifications and Professional Training
Teaching and Learning Certificate (Theory & Inquiry) by McMaster University,
SAP Associate Project Manager by SAP, Google Data Analytics Professional Certificate, Knowledge Translation Certification, Link2Feed training (in progress), SAP Business Analyst (in progress).

Professional experience

Quality Control Analyst (Project) **Sep. 2022 – Dec.2022**
Malatest, R. A. & Associates Ltd., Ontario, Canada
Quality Assurance Officer **Apr. 2019 –2020**
Mancor Industries, Ontario, Canada
Quality Compliance Officer **Aug. 2014 –2015**
The Jordanian Pharmaceutical Manufacturing Company, Amman, Jordan
Quality Assurance Trainee **2013 –2014**
Jordan Standards and Metrology Organization, Amman, Jordan

Memberships

Canadian Operational Research Society (CORS)
Institute of Transportation Engineers (ITE)