# Breno Alves Beirigo

ACADEMIC CURRICULUM VITAE

Updated September 2026


**Assistant Professor of Stochastic Operations Research**

University of Twente

Industrial Engineering & Management Science (IEMS) · High-tech Business and Entrepreneurship · Faculty BMS


I develop operational decision methods for coordinating heterogeneous agents and shared resources in dynamic logistics systems. My research connects mathematical optimization, learning, and simulation with transportation, warehousing, and resilient infrastructure.


Email · Personal page · ORCID · Scholar · UT profile · GitHub · LinkedIn


## Academic appointments

**Sep 2022–present** — **University of Twente**
**Assistant Professor of Stochastic Operations Research**
Industrial Engineering & Management Science (IEMS), Department of High-tech Business and Entrepreneurship, Faculty of Behavioural, Management and Social Sciences.

**Nov 2020–2022** — **Delft University of Technology**
**Postdoctoral Researcher in Transport Engineering and Logistics**
Research on stochastic and dynamic integrated water–land transportation in the NWO TRiLOGy project.

**Nov 2016–2020** — **Delft University of Technology**
**PhD Researcher in Transport Engineering and Logistics**
Learning- and optimization-based dynamic fleet management for autonomous mobility-on-demand in the NWO i-CAVE project.

**Apr 2015–Aug 2016** — **CEFET-MG, Brazil**
**Lecturer in Informatics**
Teaching in programming, web development, automation, and computer science.

## Education and qualifications

**2025** — **University Teaching Qualification**
**University of Twente**
Completed June 2025.

**2021** — **PhD in Operations Research**
**Delft University of Technology**
*Dynamic Fleet Management for Autonomous Vehicles: Learning- and Optimization-Based Strategies.*

**2016** — **MSc in Computer Science**
**Federal University of Viçosa**
Thesis on single- and bi-objective parallel heuristics for the travel planning problem.

**2014** — **BSc in Computer Science**
**Federal University of Viçosa**
Silver Medal Presidente Bernardes for academic performance.

**2012–2013** — **Exchange study**
**Hanze Institute of Technology, the Netherlands**
Advanced Sensor Applications.

## Peer-reviewed publications

1. C. Karademir, **B. A. Beirigo**, and B. Atasoy. “A two-echelon multi-trip vehicle routing problem with synchronization for an integrated water- and land-based transportation system.” *European Journal of Operational Research* 322(2), 480–499 (2025). DOI.
2. J. J. A. Kortekaas, **B. A. Beirigo**, and F. Schulte. “Beyond cargo hitching: Combined people and freight transport using dynamically configurable autonomous vehicles.” In *Computational Logistics*, 381–395 (2023). DOI.
3. **B. A. Beirigo**, R. R. Negenborn, J. Alonso-Mora, and F. Schulte. “A business class for autonomous mobility-on-demand: Modeling service quality contracts in dynamic ridesharing systems.” *Transportation Research Part C: Emerging Technologies* 136, 103520 (2022). DOI.
4. **B. A. Beirigo**, F. Schulte, and R. R. Negenborn. “A learning-based optimization approach for autonomous ridesharing platforms with service-level contracts and on-demand hiring of idle vehicles.” *Transportation Science* 56(3), 677–703 (2021). DOI.
5. M. van der Tholen, **B. A. Beirigo**, J. Jovanova, and F. Schulte. “The share-a-ride problem with integrated routing and design decisions: The case of mixed-purpose shared autonomous vehicles.” In *Computational Logistics* (2021). DOI.

6. **B. A. Beirigo**, F. Schulte, and R. R. Negenborn. "Overcoming mobility poverty with shared autonomous vehicles: A learning-based optimization approach for Rotterdam Zuid." In *Computational Logistics* (2020). DOI.
7. **B. A. Beirigo**, F. Schulte, and R. R. Negenborn. "Dual-mode vehicle routing in mixed autonomous and non-autonomous zone networks." In *IEEE Intelligent Transportation Systems Conference* (2018). DOI.
8. **B. A. Beirigo**, F. Schulte, and R. R. Negenborn. "Integrating people and freight transportation using shared autonomous vehicles with compartments." *IFAC-PapersOnLine* 51, 392–397 (2018). DOI.
9. **B. A. Beirigo** and A. G. dos Santos. "Application of NSGA-II framework to the travel planning problem using real-world travel data." In *IEEE Congress on Evolutionary Computation* (2016). DOI.
10. **B. A. Beirigo** and A. G. dos Santos. "A parallel heuristic for the travel planning problem." In *15th International Conference on Intelligent Systems Design and Applications*, 283–288 (2015). DOI.
11. **B. A. Beirigo**, V. de Oliveira Matos, J. E. C. Arroyo, and L. B. Gonçalves. "Genetic algorithm based approach for cluster formation in wireless sensor networks." In *XXXVIII Conferencia Latinoamericana en Informática*, 1–8 (2012). DOI.

## Doctoral thesis

**Dynamic Fleet Management for Autonomous Vehicles: Learning- and Optimization-Based Strategies.** Delft University of Technology, 2021. DOI.

## Grant leadership and funded initiatives

- **Supplying the Chip Sector: The Role of Industrial Engineering**, ChipTech Talent / Project Beethoven, approved 2026. Proposal originator and project lead.
- **Reducing the Energy Cost of AI in High-Stakes Systems**, Energy Efficient Computing call, funded 2026 (€38,000). PIs: Fernando Castor and Marcos Machado; contributor responsible for logistics and transportation applications.

## Research-program participation

- **TRiLOGy**, NWO research program on integrated water–land transportation. Postdoctoral researcher, 2020–2022.
- **i-CAVE**, NWO research program on autonomous transportation. Doctoral researcher, 2016–2020.

## Teaching and educational leadership

- Coordinator, IEM Module 1: Introduction to Industrial Engineering and Management.
- Data Analysis and Computational Thinking, BSc, lecturer and coordinator.
- Warehousing, MSc, lecturer and coordinator.
- Transportation and Logistics Management, MSc, lecturer and coordinator.
- Data Analysis and Programming, pre-MSc, lecturer and coordinator.
- Introduction to Data Analysis and Programming with Excel and VBA, BSc, lecturer and coordinator.
- CEFET-MG, BSc Mechatronics Engineering: Android Development; Automation via Web; Laboratory of Programming Languages II; Programming Training.
- CEFET-MG, Information Technology technical program: Advanced Web Applications; Computer Fundamentals.
- Federal University of Viçosa, teaching assistant: Laboratory of Programming Languages.

## Supervision

- **Cigdem Karademir:** predictive fleet management for stochastic and dynamic integrated water–land transportation.
- **Abolfazl Maleki:** decision-making under uncertainty in last-mile medical-drone delivery and dynamic collaboration among drones and complementary delivery modes.
- BSc and MSc research supervision in transportation, logistics, warehousing, routing, forecasting, inventory, and logistics analytics.
- Creator and maintainer of the public Thesis Toolkit.

## Academic service

- Invited-session chair, "Data-driven Methods for Transport Problems," IFORS 2026, Vienna.
- Session chair and organizer, "Sustainable Multimodal Transportation," IFORS 2023.
- Session-chair contributions at ICCL 2020 and IFAC CTS 2018.
- Ad hoc referee, *European Journal of Operational Research*, 2025–2026.
- Ad hoc referee, *Transportation Research Part C: Emerging Technologies*, 2024.
- Contributor to the BMS AI Learning Community, 2026.

## Selected presentations

- "A Learning-Based Energy-Aware Fleet Management Approach for Water Mobility Systems," invited session, IFORS 2026, Vienna.
- Co-author, "Optimizing Medical Drone Delivery Under Uncertainty," IFORS 2026, Vienna.
- "A deep reinforcement learning approach for on-demand ride-pooling in high-capacity water transportation systems," IFORS 2023, Santiago.

## Methods and tools

Mathematical optimization · mixed-integer programming · heuristics and metaheuristics · approximate dynamic programming · reinforcement learning · simulation · experimental design · Python · Gurobi · Java · C++ · JavaScript · Quarto · Git and GitHub.