Breno Alves Beirigo

ACADEMIC CURRICULUM VITAE

Updated August 2026

Assistant Professor of Stochastic Operations Research
University of Twente · Industrial Engineering & Management Science (IEMS) · Faculty BMS
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University profile: University of Twente · **Google Scholar:** author profile

Research profile

Operations-research scholar specializing in stochastic optimization and data-driven decision-making for transportation and logistics. My research spans fleet management, multimodal mobility, urban freight, warehousing, and autonomous systems.

Academic appointments

University of Twente - Assistant Professor of Stochastic Operations Research
August 2022-present · Enschede, the Netherlands
Research and teaching in stochastic operations research, transportation, logistics, warehousing, and data-driven decision-making. Coordinator of the first-year IEM Module 1 and several BSc, pre-MSc, and MSc courses.

Delft University of Technology - Postdoctoral Researcher in Transport Engineering and Logistics
November 2020-August 2022 · Delft, the Netherlands
Developed routing and scheduling methods for hybrid water-land fleets in the NWO TRiLOGy programme, covering synchronized multimodal passenger-freight transport.

Delft University of Technology - PhD Researcher in Transport Engineering and Logistics
November 2016-2020 · Delft, the Netherlands
Combined machine learning and optimization for routing, repositioning, service quality, accessibility, and cost in the NWO i-CAVE mobility programme.

CEFET-MG - Lecturer in Informatics
April 2015-August 2016 · Divinópolis, Brazil
Taught programming, web development, automation, and computer science in BSc Mechatronics Engineering and technical information-technology programmes.

Education and qualifications

University Teaching Qualification - University of Twente
2025. Completed June 2025.

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

MSc in Computer Science - Federal University of Viçosa
2016. Specialization in optimization. Thesis: **Single-Objective and Bi-Objective Parallel Heuristics for the Travel Planning Problem.** Parallel heuristics for realistic multi-city travel planning.

BSc in Computer Science - Federal University of Viçosa
2014. Silver Medal Presidente Bernardes for academic performance. Research in wireless sensor networks, scheduling, and heuristic optimization.

Exchange study - Hanze Institute of Technology
2012-2013 · Assen, the Netherlands. Advanced Sensor Applications: sensor networks, signal processing, geographic information systems, and research skills.

Research funding and project leadership

Supplying the Chip Sector: The Role of Industrial Engineering
2026-present · NWO ChipTech Talent Twente / Project Beethoven · Project leader
Approved **EUR 4,180** educational-innovation project integrating the regional semiconductor supply chain into the 15 EC first-year IEM Module 1 through company engagement and an integrated project for approximately 90 students.

Reducing the Energy Cost of AI in High-Stakes Systems
2026-present · UT Energy Efficient Computing call · Contributor
Funded interdisciplinary project with a **EUR 38,000 total award**. PIs: Fernando Castor and Marcos Machado. Contributor on logistics and transportation applications of information reduction and energy-aware AI.

Publications

Peer-reviewed journal articles

1. Ç. 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). Research arising from completed doctoral co-supervision.
2. **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).
3. **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 (2022).
4. V. A. Gonçalves, D. M. dos Reis, E. H. B. Maia, **B. A. Beirigo**, S. R. de Souza, and A. Y. M. Barrientos. "Algoritmo genético baseado em chaves aleatórias para o Orienteering Problem with Time Windows." *Revista Interdisciplinar de Pesquisa em Engenharia* 2(10), 90-104 (2017).

Peer-reviewed conference proceedings and book chapters

1. 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).
2. 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).
3. **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*, 492-506 (2020).
4. **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*, 1325-1330 (2018).
5. **B. A. Beirigo**, F. Schulte, and R. R. Negenborn. "Integrating people and freight transportation using shared autonomous vehicles with compartments." In *15th IFAC Symposium on Control in Transportation Systems*, 392-397 (2018).
6. **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).
7. **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).
8. **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).

Research software

ViaViz - Fleet visualization environment

Developer of a public environment for interactive replay and comparison of vehicle-routing and fleet traces. viaviz.logisticslab.io.

Education leadership and teaching

IEM Module 1: Introduction to Industrial Engineering and Management
Module coordinator and lecturer · BSc · 15 EC · 2022-present

Coordinate a 90-student first-year module, including its company project, assessment, teaching team, student support, and digital course materials.

Data Analysis and Computational Thinking
Course designer · BSc · 3 EC · scheduled 2026-2027

Data analysis, computational thinking, programming, and structured problem solving.

Warehousing
Lecturer and coordinator · MSc · 5 EC · current

Warehouse design and operations, storage, order picking, automation, and optimization.

Transportation and Logistics Management
Lecturer and coordinator · MSc · 5 EC · current

Logistics planning, mathematical modelling, uncertainty, multimodal transport, and vehicle routing.

Data Analysis and Programming
Lecturer and coordinator · pre-MSc · 3 EC · most recently 2025-2026

Programming, data analysis, visualization, version control, and testing with Python.

Introduction to Data Analysis and Programming with Excel and VBA
Lecturer and coordinator · BSc · 2 EC · through 2025-2026

Data processing, visualization, spreadsheet automation, and elementary programming.

Earlier teaching

Lecturer at CEFET-MG (2015-2016) in programming, web development, and computer fundamentals. Earlier teacher of computer networks and digital design (2013), and programming-languages teaching assistant at UFV (2014).

Research supervision

Ongoing doctoral co-supervision

Abbas Maleki, University of Twente, 2024-present. Co-supervisor. *Design and Optimization of Drone-based Medical Items Transportation.*

Completed doctoral co-supervision

Çiğdem Karademir, TU Delft, completed 2025. Formal co-supervisor (copromotor). *Synchronized Two-Echelon Routing Problems: Exact and Approximate Methods for Multimodal City Logistics.*

Supervision and examination of 55 theses.

Supervision spans transportation, logistics, warehousing, routing, forecasting, inventory, optimization, and logistics analytics, often through company-connected research projects.

Academic service

Institutional service

- **Coordinator, IEM Module 1** (2022-present). Course organization, assessment workflows, instructors, teaching assistants, student support, and digital materials.
- **BMS AI Learning Community** (2026). Contribution on AI-enhanced teaching and assessment practices.

Professional service

- **Organizer and chair, invited session**, "Data-driven Methods for Transport Problems," IFORS 2026, Vienna.
- **Session chair and organizer**, "Sustainable Multimodal Transportation," IFORS 2023, Santiago.
- **Session chair**, ICCL 2020 and IFAC Conference on Control Technology and Applications to Transportation Systems 2018.
- **Ad hoc referee** for *European Journal of Operational Research*, *Omega*, *Transportation Research Part C: Emerging Technologies*, and *IEEE Transactions on Intelligent Transportation Systems*.

Methods, computing, and languages

Research methods: mathematical optimization, mixed-integer programming, heuristics and metaheuristics, approximate dynamic programming, reinforcement learning, simulation, and experimental design. **Computing:** Python, Gurobi, Java, C++, JavaScript, Quarto, Git, and GitHub. **Languages:** Portuguese (native), English (proficient), and Dutch (A2).