Bryan GALARZA

Antwerp – Belgium

bryangalarza1303@gmail.com • LinkedIn • 0000-0002-1827-5331

Google Scholar • ResearchGate • GitHub • Personal page

Profile

Operations Research specialist with more than seven years of experience across academia and industry, designing optimisation models and algorithms for transportation, logistics and healthcare, and turning them into software that is used in practice. Postdoctoral researcher at the University of Antwerp (ANT/OR) and former Lead Operations Research Expert at Triptomatic, where I owned the optimisation workstream of a production dispatching system from research to deployment. My work combines exact methods, column generation, metaheuristics and real-time optimisation, with five peer-reviewed journal papers, a new metaheuristic framework (Parameter Space Search), and consulting projects for Atlas Copco, De Lijn and the Belgian police.

Core strengths: Combinatorial optimisation · vehicle routing and dispatching · mathematical programming · metaheuristics · real-time optimisation · algorithm design and implementation · production API design · data-driven performance analysis · technical leadership

Nationality: Belgian citizen (EU)

Experience

University of Antwerp, Department of Engineering Management (ANT/OR) **Antwerp, Belgium**

Postdoctoral Researcher *Oct 2025 – Present*

Independent and collaborative research on healthcare transportation (non-emergency medical transport) and urban logistics (STRAUSS project).

- Developing mathematical models and optimisation algorithms for urban logistics and healthcare transportation.
- Building LLM-assisted pipelines for structured, reproducible literature analysis (three-model extraction with human adjudication).
- Mentoring PhD researchers.
- Preparing research proposals with academic and industry partners.
- Publishing in peer-reviewed journals and presenting at international conferences.

Triptomatic (VLAIO-funded development project) **Duffel, Belgium (remote)**

Lead Operations Research Expert *Oct 2023 – Oct 2025*

Triptomatic is a software company offering digital solutions for healthcare transport. I was fully responsible for the Operations Research part of a VLAIO-funded project to automate vehicle dispatching for non-emergency medical transport.

- Owned the full lifecycle of the optimisation service: requirements analysis, solution methodology, design, implementation, testing and production deployment.
- Translated on-demand healthcare transport problems into OR models, and designed static and real-time dispatching and routing algorithms.
- Built a production optimisation API (data extraction, transformation, optimisation run and result write-back) integrated into the company's web platform.
- Deployed and integrated GIS routing components, including a local OSRM engine.
- Ran scenario-based benchmarking and KPI evaluation; validated the approach in side-by-side pilot runs with provider dispatchers, targeting less planning time, fewer kilometres and overtime hours, and better punctuality.
- Bridged academic research and industrial practice, working with developers and with technical and non-technical stakeholders.

University of Antwerp (ANT/OR), jointly with KU Leuven **Antwerp, Belgium**

Doctoral Researcher *Jun 2019 – Oct 2023*

PhD research on the modelling and optimisation of demand-responsive transportation systems.

- Conducted independent research on novel semi-flexible public transport services.
- Designed, implemented and tested exact methods (MIP, column generation), metaheuristics and real-time algorithms for static and dynamic optimisation.
- Developed Parameter Space Search, a new metaheuristic framework.
- Published five papers in international journals .
- Presented at nine international conferences, plus invited seminars.
- Supervised Master's students in practical projects and thesis work.
- Worked on and consulted for collaborative projects with industry partners (De Lijn, Belgian police).
- Graduated on 15 May 2023 with a PhD in Operations Research, funded by the Research Foundation Flanders (FWO).

Atlas Copco **Wilrijk, Belgium**
Improvement Consultant *Sep 2018 – Apr 2019*
Joined through the young talent programme, then continued as a consultant on packaging policy for AIRnet and piping components.

- Documented the existing packaging policy, gathering constraints in weekly meetings with several departments.
- Optimised it with a mixed-integer model and metaheuristics (simulated annealing), targeting a roughly 50% reduction in annual distribution and storage costs, and delivered an implementation plan.

Education

University of Antwerp, ANT/OR **Antwerp, Belgium**
Doctor of Philosophy (Ph.D.) in Operations Research *Jun 2019 – May 2023*
Joint research with KU Leuven, funded by the Research Foundation Flanders (FWO)
Supervisors: Kenneth Sörensen and Pieter Vansteenwegen
Thesis: Towards the Goldilocks Zone of demand-responsive transportation services

Ghent University, Industrial Systems Engineering **Ghent, Belgium**
Master of Science in Engineering Sciences, Cum Laude *Sep 2016 – Jul 2018*
Industrial Engineering and Operations Research (burgerlijk ingenieur)
Thesis: Multimodal coordination schemes for Intelligent Traffic Systems

Ghent University, Engineering and Architecture **Ghent, Belgium**
Bachelor of Science in Engineering Sciences *Sep 2012 – Jul 2016*
Chemical Engineering and Materials Science (burgerlijk ingenieur)

Sint-Lievenscollege **Antwerp, Belgium**
Secondary education (ASO) *Sep 2005 – Jul 2011*
Science and Mathematics

Research Projects

University of Antwerp (ANT/OR) **Antwerp, Belgium**
Fundamental research in Non-Emergency Medical Transportation (NEMT) *2025 – Present*
Generic optimisation models and real-time solution approaches for NEMT systems, including a PRISMA-based scoping review of 81 studies extracted with a reproducible three-LLM pipeline.

Triptomatic (VLAIO) **Duffel, Belgium (remote)**
AI-powered dispatching for non-emergency medical transport *2023 – 2025*
Automatic dispatching module that drafts and continuously re-optimises the daily trip schedule and crew assignments, with dispatchers kept in the loop.

University of Antwerp (PhD project) **Antwerp, Belgium**
Semi-flexible public transport optimisation *2019 – 2023*
Demand-responsive feeder services combining assignment, routing and timetabling decisions; includes a case study on the N177 corridor (Boom–Antwerp) against existing De Lijn lines.

Industry and Consulting Projects

Triptomatic (VLAIO development project) **Belgium**
Production optimisation API for healthcare dispatching *2023 – 2025*
End-to-end optimisation service covering data extraction, transformation, optimisation and result write-back, integrated into a commercial web platform with a local OSRM/GIS routing engine.

De Lijn **Flanders, Belgium**
School bus routing for students with special needs *2022*
Capacitated routing with wheelchair and accessibility constraints on real data for Diest (18 vehicles) and Gavere (9 vehicles), solved with a C++ large neighbourhood search and a Python layer for instance handling and visualisation.

University of Antwerp (side project) **Belgium**
School choice assignment *2022*
Implemented in C++ and compared two assignment mechanisms (randomised constructive assignment and serial dictatorship) for 8,500 students across 86 schools, with capacity, priority and sibling rules.

Belgian police (mobile unit) **Belgium**
Patrol route optimisation *2020*
Modelled time-dependent patrol routing with priority levels, visit durations, time windows and minimum/maximum revisit intervals, keeping routes effective but unpredictable.

Atlas Copco **Wilrijk, Belgium**
Packaging policy optimisation *2018 – 2019*
Mixed-integer model and simulated annealing for AIRnet and piping components, targeting a roughly 50% reduction in annual distribution and storage costs.

Publications

Journal articles

Transportmetrica A: Transport Science
The real-time dynamic online feeder service with a maximum headway at mandatory stops *2023*
B.D. Galarza Montenegro, K. Sörensen, P. Vansteenwegen
DOI: https://doi.org/10.1080/23249935.2023.2227738

Networks **83(1)**
A demand-responsive feeder service with a maximum headway at mandatory stops *2023*
B.D. Galarza Montenegro, K. Sörensen, P. Vansteenwegen
DOI: https://doi.org/10.1002/net.22185

Transportation Research Part C: Emerging Technologies **137, 103573**
A survey on demand-responsive public bus systems *2022*
P. Vansteenwegen, L. Melis, D. Aktaş, B.D. Galarza Montenegro, P. Vieira, K. Sörensen
DOI: https://doi.org/10.1016/j.trc.2022.103573

Networks **80(3)**
A column generation algorithm for the demand-responsive feeder service with mandatory and optional, clustered bus-stops *2022*
B.D. Galarza Montenegro, K. Sörensen, P. Vansteenwegen
DOI: https://doi.org/10.1002/net.22095

Transportation Research Part C: Emerging Technologies **127, 103102**
A large neighborhood search algorithm to optimize a demand-responsive feeder service *2021*
B.D. Galarza Montenegro, K. Sörensen, P. Vansteenwegen
DOI: https://doi.org/10.1016/j.trc.2021.103102

Thesis abstract

4OR **22**
Towards the Goldilocks Zone of demand-responsive bus services *2024*
B.D. Galarza Montenegro (PhD thesis abstract)
DOI: https://doi.org/10.1007/s10288-023-00546-4

Under review

International Transactions in Operational Research **submitted**
Non-emergency medical transportation planning: A systematic scoping literature review *2026*
B.D. Galarza Montenegro, K. Sörensen, R.A. Melo

Talks

Invited seminars

CORE, UCLouvain **Louvain-la-Neuve, Belgium**
CORE OR Seminar *2026*
Applied Operations Research solutions from an industrial research project

KU Leuven **Leuven, Belgium**
CIB internal research seminar *2019, 2021, 2022*
Semi-flexible bus services: models and optimisation approaches

Conference presentations

ORBEL 40 **Leuven, Belgium**
40th Annual Conference of the Belgian Operations Research Society *2026*
An application of advanced optimization methods in Non-Emergency Medical Transportation
Co-author: Adaptive Hybrid VNS-LNS for Time-Dependent Grocery Delivery Vehicle Routing (presented by O. Elsherif)

Beta **Soesterberg, The Netherlands**
Beta Symposium 2025 *2025*
SMART-NEMT: Structured Models and Algorithms for Real-Time Non-Emergency Medical Transport

IFORS 2023 **Santiago, Chile**
23rd Conference of the International Federation of Operational Research Societies *2023*
The real-time dynamic online feeder service with a maximum headway at mandatory stops

CLAIO 2022 **Buenos Aires, Argentina**
XXI Latin Ibero-American Conference on Operations Research *2022*
Towards better service quality with the dynamic feeder service with a maximum headway at mandatory stops

ORBEL 36 **Ghent, Belgium**
36th Annual Conference of the Belgian Operations Research Society *2022*
Towards better service quality with the dynamic feeder service with a maximum headway at mandatory stops

MIC 2022 **Ortigia-Syracuse, Italy**
14th Metaheuristics International Conference *2022*
A demand-responsive feeder service with a maximum headway at mandatory stops

ELAVIO 2022 **Monterrey, Mexico**
Latin Ibero-American Summer School on Operations Research *2022*
A demand-responsive feeder service with a maximum headway at mandatory stops

NORS 2021 **Bergen, Norway**
The Norwegian Operations Research Society *2021*
A demand-responsive feeder service with mandatory stops and frequency constraints

EURO 2021 **Athens, Greece**
31st European Conference on Operational Research *2021*
A large neighbourhood search algorithm to optimise a demand-responsive feeder service

ORBEL 35 **Virtual**
Corona Sessions: Public Transportation *2021*
A demand-responsive feeder service with mandatory and optional bus stops

ORBEL 34 **Lille, France**
34th Annual Conference of the Belgian Operations Research Society *2020*
A demand-responsive feeder service with mandatory and clustered, optional bus stops

Supervision and Mentoring

University of Antwerp **Antwerp, Belgium**
PhD mentoring *2025 – Present*
Research mentoring of PhD researchers on modelling, algorithms and research execution.

University of Antwerp **Antwerp, Belgium**
Master's and Bachelor's supervision *2019 – Present*
Supervision and day-to-day guidance of students in optimisation-related projects and theses.

Grants and Funded Projects

University of Antwerp **Antwerp, Belgium**
SMART-NEMT BOF project *2025 – 2026*
Researcher in a funded project on non-emergency medical transportation.

Triptomatic **Duffel, Belgium (remote)**
VLAIO-funded healthcare mobility project *2023 – 2025*
Lead Operations Research Expert in a funded innovation project on automated healthcare transportation planning.

University of Antwerp and KU Leuven **Belgium**
FWO-funded doctoral research *2019 – 2023*
Research Foundation Flanders funding for the doctoral project on semi-flexible demand-responsive bus services.

Prizes and Awards

EURO **Monterrey, Mexico**
ELAVIO scholarship *2022*
Awarded the EURO scholarship to attend the ELAVIO summer school.

University of Antwerp **Antwerp, Belgium**
Best Paper Award – finalist (2nd place) *2020*
Doctoral Day of the Faculty of Business and Applied Economics.

Technical Skills

Programming: *Proficient:* C++, Python (NumPy, pandas, SciPy, matplotlib), Java, R, MATLAB
Basic: SQL, Julia, mongocxx (MongoDB C++ driver)

Optimisation: *Proficient:* Gurobi, CPLEX, Hexaly (exact and heuristic solvers)
Intermediate: AMPL (modelling language)
Methods: MIP, column generation, large neighbourhood search, simulated annealing, GRASP, tabu search, real-time re-optimisation

Systems & tools: *Proficient:* LaTeX, Git/GitHub/Bitbucket (version control, CI/CD), API development
Intermediate: Docker (containerised services), OSRM/OpenStreetMap (GIS routing), Jira (project management)

Simulation: *Elementary:* FlexSim (discrete-event simulation), VISSIM (microscopic traffic simulation), Maple

Office: Excel/Sheets, PowerPoint/Slides, Word/Docs, Teams/Meet, Outlook/Gmail

Languages

Spanish: Native
Dutch: Proficient
English: Proficient
French: Elementary