LARA DI CAVALCANTI PONTES

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Languages: Native Portuguese, Fluent English (*TOEFL iBT:* 113/120), and Basic French.
Github: laradicp **LinkedIn:** laradicp **Personal website:** laradicp.github.io

EDUCATION

Massachusetts Institute of Technology (MIT) 09/2025 – Exp. 05/2031
Ph.D. in Operations Research *Cambridge, MA, United States*

Universidade Federal da Paraíba (UFPB) 05/2019 – 07/2024
B.S. in Computer Engineering, cum laude – 9.7/10 (#1 GPA in the history of the program) *João Pessoa, Brazil*

PUBLICATIONS AND RESEARCH PAPERS

Saragih, A., **Pontes, L.**, Amin, S., & Fransoo, J. C. (2024). Spin the Bottle Bill: Deposit-Refund System Policy and Reverse Supply Chain Design.

- Honorable Mention (Third Place), 2025 POMS College of Sustainable Operations Best Student Paper
- Winner, 2025 INFORMS Section on Location Analysis Best Student Paper
- Finalist (Top 3), 2025 DSI Doctoral Best Student Paper

Pontes, L., Neves, C., Subramanian, A., & Battarra, M. (2024). The maximum length car sequencing problem. *European Journal of Operational Research*, 316(2), 707-717.

- Finalist, 2024 INFORMS Undergraduate OR Prize
- Winner (#1/112), 2022 UFPB Young Researcher Award in the field of Exact and Earth Sciences
- Winner, 2021 Brazilian Symposium on OR Best Undergraduate Work

CONFERENCE PRESENTATIONS

Pontes, L. (2024, October). *The maximum length car sequencing problem.* **Undergraduate Operations Research Prize**, INFORMS Annual Meeting, Seattle, United States.

Pontes, L. (2024, July). *The maximum length car sequencing problem.* EURO Conference, Copenhagen, Denmark.

RESEARCH EXPERIENCE

Research Assistant – MIT 09/2025 – Ongoing
Supervisor: Dimitris Bertsimas

- Developing models for differential diagnosis using combinatorial optimization, integrated with large language models to support structured and data-driven clinical reasoning.

Research Assistant – Logistics & Optimization Group (LOG) UFPB 07/2024 – Ongoing
Collaborators: Cecília Bezerra, Prof. Luciano Costa, Prof. Anand Subramanian, Prof. Brian Denton (U. Michigan)

- Developing a MILP model for the inventory management of a public university hospital.

Summer Pre-Doctoral Research – MIT 05/2024 – 09/2024
Collaborators: Austin Saragih (MIT), Prof. Saurabh Amin (MIT), Prof. Jan C. Fransoo (Tilburg University)

- Worked on a recursive bilevel mixed-integer nonlinear program to maximize the recycling rate of beverage containers in deposit-refund systems.
- Proved the NP-hardness of the second-level supply chain design problem, contributed to the convexity and monotonicity analyses for global optimality of the proposed method, and conducted a case study in California.
- Provided policy insights to help the California state government achieve and surpass its 80% recycling goal.

Research Fellow – Fiotec Fiocruz 12/2023 – 03/2024

- Developed a MILP model to minimize the costs of ICU bed management in Brazil's Federal District.

Research Assistant Fellow – LOG UFPB 08/2020 – 01/2024
1-month Exchange Period – University of Bath 07/2023
Supervisors: Prof. Anand Subramanian, Prof. Maria Battarra (University of Bath) *Collaborator:* Carlos Neves

- Leading author of paper published in the *European Journal of Operational Research* (EJOR) about a new variant of the car sequencing problem that maximizes manufactured cars without violating spacing constraints.
- Formulated MILP models, developed combinatorial bounds, implemented iterated local search-based heuristic and exact iterative algorithms, and conducted an instance space analysis using MATILDA.
- Reduced the time required to solve the company's needs from hours to less than a second.

WORK EXPERIENCE

Operations Analyst – Praso 01/2025 – 07/2025

- Implemented a heterogeneous fleet vehicle routing model (forked from PyVRP) with time windows, site-dependent constraints, route clustering, and soft maximum distance penalties.
- Achieved record-high rates of successful deliveries.

Prescriptive Analytics Research Intern – SaveAdd 09/2023 – 02/2024

- Implemented an efficient heuristic solution for the prescription of surprise bags using daily unsold stock. The feasibility of each surprise bag is determined by an embedded 3D bin packing model.
- Built a value proposition classification dataset and developed a data-driven decision-making tool with DistilBERT to identify the best hyper-segmentation strategy for food industry suppliers with unsold stock.

Software Engineer Internship Offer (Winter 2023) – Meta UK 04/2022

Combinatorial Optimization Developer – Atoptima (France) and UFPB 02/2021 – 08/2021

- Contributed to the open-source branch-price-and-cut framework Coluna.
- Worked on incorporating support for customized input data and optimizers, implemented the retrieval of disaggregated solutions, and added features to the column generation and the block decomposition modules.

Introduction to Computer Engineering Teaching Assistant – UFPB 09/2020 – 12/2020

ACHIEVEMENTS AND AWARDS

Tech Fellow – Fundação Estudar 2022
A merit scholarship to high-performing Brazilian students aimed at leading the next technology revolutions in Brazil. The program selected 23 out of 4,285 candidates, and it involves a study grant, access to a distinct community of people in tech, career support, and mentorship from prominent leaders in various fields.

First place at entrance exam for Computer Engineering at UFPB 2019
Achieved a score of 965.9 in Mathematics at the National High School Exam (top <0.1% in Brazil).

Maximum score at the National High School Exam (Enem) Essay 2017
Seventy-seven students out of more than 6 million candidates got the maximum score that year.

Second place at robotics competition for gold medalists at Brazilian Robotics Olympiad 2017
Represented the Paraíba state nationally and ranked first among students without prior programming knowledge.

National Gold and Silver Medals at Brazilian Robotics Olympiad, and Silver Medals at International Mathematical Kangaroo Competition and Astronomy and Astronautics Brazilian Olympiad 2017/18

COMMUNITY ENGAGEMENT

Co-Founder and Board Member – Momento 09/2024 – Pres.
First alum program for tech students in Paraíba, involving mentorship and events for career development.