

Cleiton Neves Santos

PhD Candidate in Computer Science, Federal University of Minas Gerais (UFMG), Brazil

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RESEARCH INTERESTS

Multi-robot systems; dynamic vehicle routing; perimeter defense; task allocation; coalition formation; combinatorial optimization.

EDUCATION

Ph.D. in Computer Science

Nov 2025 – present (expected 2029)

Federal University of Minas Gerais (UFMG), Brazil – VeRLab

Advisor: Prof. Douglas G. Macharet.

Topic: multi-robot perimeter defense as dynamic vehicle routing, with complexity results and algorithms for heterogeneous teams.

M.Sc. in Computer Science

Mar 2023 – Jun 2025

Federal University of Minas Gerais (UFMG), Brazil

Thesis: *Adaptive Team Formation for Collaborative Perimeter Defense*.

Advisor: Prof. Douglas G. Macharet.

3rd place, Brazilian Robotics Thesis and Dissertation Contest (CTDR 2025, M.Sc. category); finalist, Master's Thesis Award, Brazilian Symposium on Operations Research (SBPO 2026).

Graduate Specialization in Artificial Intelligence and Machine Learning

2021 – 2022

Pontifical Catholic University of Minas Gerais (PUC Minas), Brazil

Final project: prioritizing individuals for COVID-19 testing under test scarcity.

Advisor: Prof. Luiz Alberto Ferreira Gomes.

B.Sc. in Computational Mathematics

2015 – 2019

Federal University of Minas Gerais (UFMG), Brazil

PUBLICATIONS

Conference papers

1. **C. N. Santos** and D. G. Macharet. Dynamic Coalition Formation for Probabilistic Perimeter Defense with Homogeneous Defenders. In *Brazilian Conference on Robotics (CROS)*, João Pessoa, 2026. doi:10.1109/CROS69211.2026.11565814
2. L. R. D. Paes, **C. N. Santos**, and D. G. Macharet. Multi-agent Perimeter Defense of Spatially Distributed Regions. In *Brazilian Conference on Robotics (CROS)*, João Pessoa, 2026.

Under review and in preparation

3. **C. N. Santos** and D. G. Macharet. Manuscript under review (title and venue withheld). Exact unsplittable-flow formulation for heterogeneous defender teams; NP-completeness.
4. **C. N. Santos** and D. G. Macharet. Manuscript in preparation. Two-layer policy for moving perimeters with feasibility guarantees.

M.Sc. thesis summaries (thesis competitions)

5. **C. N. Santos** and D. G. Macharet. Adaptive Team Formation for Collaborative Perimeter Defense. Short version of the M.Sc. thesis for the Thesis and Dissertation Contest (CTDR), in *Extended Proceedings of the XVII Brazilian Robotics Symposium (SBR)*, 2025. 3rd place.
6. **C. N. Santos** and D. G. Macharet. Adaptive Team Formation for Collaborative Perimeter Defense. Master's Thesis Award session, *LVIII Brazilian Symposium on Operations Research (SBPO)*, 2026. Finalist.

RESEARCH AND DEVELOPMENT EXPERIENCE

Full-Stack Engineer, Multivisão Project (Phases 2 and 3)

May 2023 – present

VeRLab, Department of Computer Science, UFMG – UFMG/Petrobras partnership

- Algorithms for detecting divergences between 3D point clouds of industrial plants and their CAD/CAE models, and for semantic labeling of the matched elements.
- Refactoring and deployment of the system in Petrobras' computing environment.

INDUSTRY EXPERIENCE

Developer Analyst (Junior, then Mid-level)

Jul 2021 – Mar 2023

Grupo LPJ IT Consulting, Belo Horizonte, Brazil

Feature development, refactoring, code review and deployment for a web platform (PHP/Laravel, MySQL, AWS).

AWARDS

- Finalist, Master's Thesis Award, LVIII Brazilian Symposium on Operations Research (SBPO), Brazilian Operations Research Society (SOBRAPO), 2026.
- 3rd place, Brazilian Robotics Thesis and Dissertation Contest (CTDR), M.Sc. category, Brazilian Computer Society (SBC), 2025.
- Top 100, IBM Behind the Code Marathon, Latin America, 2021.
- Top 100, IBM Behind the Code Marathon, Brazil, 2019.

TALKS

- Adaptive Team Formation for Collaborative Perimeter Defense. Master's Thesis Award session, Brazilian Symposium on Operations Research (SBPO), 2026.
- Dynamic Coalition Formation for Probabilistic Perimeter Defense with Homogeneous Defenders. CROS, João Pessoa, 2026.
- Adaptive Team Formation for Collaborative Perimeter Defense. Thesis and Dissertation Contest (CTDR), Brazilian Robotics Symposium (SBR), 2025.

SKILLS

Programming Tools

Python, C/C++ , Java (Spring Boot), PHP (Laravel), SQL
Linux, Docker, AWS

Languages

Portuguese (native); English (full professional); Spanish (reading, hearing)