

# Leandro Farias Maia

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## RESEARCH INTERESTS

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My research focuses on block decomposable methods for large-scale optimization problems, which arise frequently in machine learning and data science applications. I am particular interested in Large-Scale Non-Smooth & Non-Convex Optimization.

## EDUCATION

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- 2023 - 2025 Ph.D. in Industrial Engineering, **Texas A&M University**
  - Advisor: Dr. David Huckleberry Gutman. GPA: 4.0
- 2020 - 2023 Ph.D. in Industrial Engineering (Transferred), **Texas Tech University**
  - Advisor: Dr. David Huckleberry Gutman.
- 2016 - 2018 M.A. in Mathematics, **Federal University of Para**
  - Best entrance grade
  - Thesis: Diophantine Equations
- 2008 - 2012 B.S. in Computer Engineering, **Military Institute of Engineering (IME)**
  - IME is the oldest and one of the best ranked engineering schools in Brazil

## PUBLICATIONS

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- Farias Maia, Leandro**, Baraldi, Robert, and Kouri, Drew P. (Aug. 2024). “A Proximal Trust-Region Method with Inexact Proximity Operators”. In: *Sandia Proceedings (Under Review)*.
- Farias Maia, Leandro**, Gutman, David Huckleberry, Monteiro, Renato D.C., and Silva, Gilson do Nascimento (July 2024). “An Adaptive Proximal ADMM for Nonconvex Linearly-Constrained Composite Programs”. In: *Mathematical Programming (Under Review)*. URL: <https://www.arxiv.org/abs/2407.09927>.
- Farias Maia, Leandro** and Gutman, David Huckleberry (June 2024). “Randomized Coordinate Descent in the Hölder Smooth Setting”. In: *Optimization Letters (Conditionally accepted)*. URL: <https://arxiv.org/html/2403.08080v1>.
- Farias Maia, Leandro**, Gutman, David Huckleberry, and Hughes, Ryan Christopher (Jan. 2024). “The Inexact Cyclic Block Proximal Gradient Method and Properties of Inexact Proximal Maps”. In: *Journal of Optimization Theory and Applications*. URL: <https://link.springer.com/article/10.1007/s10957-024-02404-7>.
- Farias Maia, Leandro**, Nobre, Heytor Bruno, Justel, Claudia M., and Oliveira, Camila C.F. (Sept. 2014). “Community Detection Problem for an Academic Network (in Portuguese)”. In: *Sistemas & Gestão* 9.4, pp. 480–487. URL: <https://www.revistasg.uff.br/sg/article/view/V9N4A6/SGV9N4A6>.

## WORKING PAPERS:

- Farias Maia, Leandro**, Baraldi, Robert, and Kouri, Drew P. (2024). “The Inexact Proximal Gradient Method applied to an Inexact Trust-Region Method”. In: *Preparation for Submission to INFORMS Journal on Computing*.
- Farias Maia, Leandro**, Gutman, David Huckleberry, and Hughes, Ryan Christopher (2024). “The Inexact Randomized Block Proximal Gradient Method”. In: *Preparation for Submission to Operations Research Letters*.

## WORK EXPERIENCE

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### Graduate Research - Sandia National Labs

May 2024 - Aug 2024

- Working on inexact proximal map for an inexact trust-region method for nonsmooth optimization
- Implemented the proposed inexact proximal map in MATLAB and applied an inexact trust-region method to solve Burger’s equation.
- Advised by Dr. Drew P. Kouri and Dr. Robert Baraldi

- Research Assistant - Texas A&M University and Texas Tech University** Jan 2020 - present
- Working on multiple projects in large-scale optimization intended for publication in reputable optimization journals
  - Research assistant for Dr. David Huckleberry Gutman
- Teaching Assistant - Texas Tech University** Jan 2023 - May 2023
- Teaching assistant for “Probabilistic Operations Research” (IE3312).
  - Graded assignments and exams as well as ran office hours for 40 students
- Captain - Brazilian Army** Jan 2019 - Dec 2019
- Captain assigned to the Connected Amazon project, which provides connectivity for five geographically remote cities in the Amazon.
  - Installed fiber under the Amazon river, and built smart data centers in each of the target cities.
  - Data center project, executed under my leadership and in collaboration with my team, incurred a total expenditure of \$10M.
- Programmer - Institute of Pure and Applied Math (IMPA)** Jan 2011 - Dec 2012
- Part of “Petróleo Brasileiro S.A” (Petrobras) Real-Options group at IMPA.
  - In charge of interpreting the mathematical model and implementing it in MATLAB and Java.

## PRE-PH.D. RESEARCH EXPERIENCE

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- Research Experience for Undergraduates at Texas Tech University** 2017
- Explored the Branch-and-cut method for linear programming with multiple-choice constraints.
  - Applied CPLEX and Gurobi as to implement the algorithms generated.
  - Project Advisor: Dr. Ismael De-Farias.

## PRESENTATIONS AT CONFERENCES

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- 25th International Symposium on Mathematical Programming (ISMP)** 2024
- An Adaptive Proximal ADMM for Nonconvex Linearly-Constrained Composite Programs
- INFORMS Optimization Society** 2024
- An Adaptive Block Proximal ADMM for Weakly Convex, Linearly-Constrained Composite Functions
- INFORMS Annual Meeting** 2023
- The Inexact Block Proximal Gradient Method And Inexact Proximal Maps
- SIAM Conference on Optimization** 2023
- The Inexact Proximal Gradient Method And Inexact Proximal Maps
- INFORMS Annual Meeting** 2022
- The Inexact Cyclic Block Proximal Gradient Method And Inexact Proximal Maps

## SERVICES

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- Conference Session Chair**
- *INFORMS Annual Meeting 2024*: Recent Advances in First-Order Methods and ADMM.
  - *ISMP 2024*: Large-Scale and Structured Optimization.
  - *INFORMS Annual Meeting 2023*: Large-Scale and Structured Optimization.
  - *SIAM Conference on Optimization 2023*: Large-Scale and Structured Optimization.
- Secretary of the INFORMS Student Chapter at Texas Tech University** 2022-2023
- Organized the Chapter’s funding, coordinated talks with external members, and helped to arrange internal poster competitions.
- Volunteer at “Projeto Ágape”** 2018-2019
- Organized the Chapter’s funding, coordinated talks with external members, and helped to arrange internal poster competitions

## SKILLS

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| Programming Languages | C/C++, Java, R, Matlab, Python.  |
| Technical Software    | L <sup>A</sup> T <sub>E</sub> X, CPLEX, Gurobi.  |
| Relevant Courses      | Convex Optimization, Optimization 1 & 2, Linear Programming, Network Optimization, Real Analysis, Stochastic Process, , Numerical Linear Algebra, Topology, Measure Theory, Probability Theory, Manifold Optimization. |

## MOST RECOGNIZABLE AWARDS

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| 2015       | Silver and Bronze Medals - Brazilian Army  |
| 2009, 2012 | Bronze Medal - <b>International Math Competition for University Students (IMC)</b> |
| 2006       | Bronze Medal - <b>International Math Olympiad (IMO)</b>                            |
| 2006       | Gold Medal in <b>Brazilian Math Olympiad (OBM)</b>                                 |

## REFERENCES

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Dr. David H. Gutman (advisor) - dhgutman@tamu.edu



Dr. Renato D.C. Monteiro - rm88@gatech.edu



Dr. Drew P. Kouri - rgelca@gmail.com