

# Alane Marie de Lima

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## EDUCATION

### PhD Candidate in Computer Science, Federal University of Parana (UFPR), Curitiba

FEBRUARY 2018 – present

#### Approximation Algorithms in Graphs via Sample Complexity

Advisors: André Luis Vignatti, PhD, Murilo Vicente Gonçalves da Silva, PhD

- Design approximation algorithms based on sampling for complex networks (with a particular interest in power-law graphs, which are common in social and natural phenomena) using key concepts from statistical learning theory.

### MSc in Computer Science, Federal University of Parana (UFPR), Curitiba

FEBRUARY 2015 – AUGUST 2017

#### Exact Algorithms for the Graph Coloring Problem

Advisor: Renato Carmo, PhD

- Surveyed the state-of-the-art exact algorithms for the graph coloring problem. The main goal of the thesis is to group and contextualize such algorithms, which were scattered in the literature at that time.

### BSc in Computer Science, Midwestern State University (UNICENTRO), Guarapuava

FEBRUARY 2011 – DECEMBER 2014

#### A Coloração de Grafos Fuzzy aplicada ao Problema de Alocação de Horários

Advisor: Fábio Hernandez, PhD

- Studied how to use Graph Theory and fuzzy graph coloring to create an algorithm that generated the Computer Science course timetable, so that the amount of conflicts in schedules was the minimum possible.
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## EXPERIENCE

### Lecturer, Midwestern State University (UNICENTRO), Guarapuava

AUGUST 2017 – JANUARY 2018

- **Programs:** Computer Science, Computational and Applied Mathematics
- **Courses:** Complexity and Algorithm Analysis, Graph Algorithms, Data Structures

### Teaching Assistant, Federal University of Parana (UFPR), Curitiba

AUGUST 2018 – DECEMBER 2018

Course supervisors: André Vignatti, PhD and Murilo V. G. da Silva, PhD

- **Course:** Randomized Algorithms
- Teach classes about Probability Theory; provide support for the professors; correct assignments; provide support for students on courseworks.

## Full-stack developer, Sigma Dataserv Informática S/A, Guarapuava

JULY 2014 – DECEMBER 2014

- Internship on software development in Java and Javascript.
- Worked in projects for the state government services as the Guarda Mirim of Paraná and the System of Electronic Processes of Polícia Militar do Paraná (eProc PMPR).

## Undergraduate Teaching Assistant, Midwestern State University, Guarapuava

FEBRUARY 2012 – JULY 2012

Course supervisor: Inali Wisniewski Soares, PhD

- **Course:** Introduction to Programming
- Provide support for the professor in her classes and tutorials for students; mentor students in programming concepts and the use of C language.

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## SELECTED PUBLICATIONS

### Journal

- **Improved Approximation Bounds for the Dominating Set and the Vertex Cover in Power-law Graphs** (A. M. de Lima, M. V. G. da Silva, A. L. Vignatti). Submitted to Theoretical Computer Science, 2021. Available online in [<https://www.inf.ufpr.br/amlima/dom-tcs.pdf>]
- **Percolation Centrality via Rademacher Complexity** (A. M. de Lima, M. V. G. da Silva, A. L. Vignatti). Discrete Applied Mathematics, 2021. Available online in [<https://doi.org/10.1016/j.dam.2021.07.023>]
- **Exact Algorithms for the Graph Coloring Problem** (A. M. de Lima, R. Carmo). Revista de Informática Teórica e Aplicada (RITA), v. 25, p. 57-73, 2018. Available online in [<https://doi.org/10.22456/2175-2745.80721>].

### Conference

- **A Deductive-Formal Derivation for the Preferential Attachment Metric for Link Prediction** (A. M. de Lima, M. V. G. da Silva, A. L. Vignatti). In Proceedings of IV Workshop de Pesquisa em Computação dos Campos Gerais (WPCCG), 2021. Available online in [[http://www.wpccg.pro.br/wpccg2021/resumos/WPCCG\\_2021\\_paper\\_10.pdf](http://www.wpccg.pro.br/wpccg2021/resumos/WPCCG_2021_paper_10.pdf)].
- **Shortest Path Centrality and the APSP problem via VC-dimension theory** (A. M. de Lima, M. V. G. da Silva, A. L. Vignatti). To be submitted, 2021. Available online in [<https://www.inf.ufpr.br/murilo/public/WG2020.pdf>].
- **Problema APSP via Dimensão-VC e médias de Rademacher** (A. M. de Lima, A. L. Vignatti, M. V. G. da Silva). In Proceedings of VI Encontro de Teoria da Computação (ETC), 2021. Available online in [<https://sol.sbc.org.br/index.php/etc/article/view/16369/16210>] (in Portuguese).
- **Estimating the Percolation Centrality of Large Networks through Pseudo-dimension Theory** (A. M. de Lima, M. V. G. da Silva, A. L. Vignatti). In Proceedings of the 26th ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD), 2020. Available online in [<https://dl.acm.org/doi/10.1145/3394486.3403235>].
- **Recognizing Power-law Graphs by Machine Learning Algorithms Using a Reduced Set of Structural Features** (A. M. de Lima, A. L. Vignatti, M. V. G. da Silva). In Proceedings of the 16th National Meeting on Artificial and Computational Intelligence (ENIAC), Salvador-Brazil, 2019. Available online in [<https://sol.sbc.org.br/index.php/eniac/article/view/9319>].
- **Um Algoritmo para o Problema de Caminho Mínimo Fuzzy usando Dominância e Similaridade** (F. Hernandez, A. M. de Lima). III Congresso Brasileiro de Sistemas Fuzzy, João Pessoa-Brazil. Recentes Avanços em Sistemas Fuzzy, v. 1, p. 163-174, 2014. Available online in [<http://www.inf.ufpr.br/amlima/cbsf2014.pdf>] (in Portuguese).

## Media

- **Annie Easley: legado de ciência e luta, da Terra ao espaço** (A. M. de Lima). Revista SBC Horizontes (Brazilian Computer Society Magazine), ISSN 2175-9235. Available online in [<https://horizontes.sbc.org.br/index.php/2022/02/annie-easley-legado-de-ciencia-e-luta-d-a-terra-ao-espaco/>] (in Portuguese), 2022.
  - **Joan Clarke e a Voz Feminina na Quebra da Enigma** (A. M. de Lima). Revista SBC Horizontes (Brazilian Computer Society Magazine), ISSN 2175-9235. Available online in [<http://horizontes.sbc.org.br/index.php/2020/10/joan-clarke-e-a-voz-feminina-na-quebra-da-enigma/>] (in Portuguese), 2020.
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## RESEARCH PROJECTS

### Federal University of Parana (UFPR), Curitiba

JANUARY 2017 – present

**Teoria de Grafos: Otimização Combinatória, Complexidade Computacional, Algoritmos e Classes** (CNPq 428941/2016-8)

- Research topics: Graph Theory, Combinatorial Optimization, Computational Complexity, Algorithms and Classes

### Midwestern State University (UNICENTRO), Guarapuava

JANUARY 2012 – JULY 2014

**Undergraduate research project**

Advisor: Fábio Hernandez, PhD

- Study of the shortest path problem in graphs using fuzzy set theory.
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## SCIENTIFIC AND ORGANIZING COMMITTEES

*Revised scientific publications in the following conferences/journals:*

- IV Workshop de Pesquisa em Computação dos Campos Gerais (WPCCG), 2021 (reviewer/session chair).
  - ACM Computing Surveys journal (CSUR), 2020 (reviewer).
  - X Latin and American Algorithms, Graphs and Optimization Symposium (LAGOS), 2019 (reviewer).
  - IV Encontro de Teoria da Computação (ETC), 2019 (reviewer).
  - III Workshop de Pesquisa em Computação dos Campos Gerais (WPCCG), 2019 (reviewer).
  - XXVI Encontro Anual de Iniciação Científica (EAIC-UNICENTRO), 2017 (reviewer).
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## GRANTS, HONORS AND AWARDS

- Scholarship (Anita Borg Institute for Women and Technology), **Virtual Grace Hopper Celebration (vGHC21)**, Virtual, September 27th – October 1st, 2021.
- Student grant (KDD'20 Student Registration Award), **26th ACM SIGKDD Conference on Knowledge Discovery and Database**, Virtual, August 23th – 27th, 2020.
- Student grant (Center for Mathematical Modeling), **XV Summer School in Discrete Mathematics**, Valparaiso-Chile, January 6th – 10th, 2020.
- 1st place at the **Computer Science Major Entrance Exam**, Midwestern State University (UNICENTRO), 2011.

- Honorable mention, **3rd Brazilian Mathematics Olympiad for Public Schools (OBMEP)**, Ministry of Education, Ministry of Science and Technology, Brazilian Mathematical Society, Instituto Nacional de Matemática Pura e Aplicada (IMPA), 2008.
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## MEDIA AND SCIENTIFIC DISSEMINATION

### Columnist, SBC Horizontes Magazine (Brazilian Computer Society)

OCTOBER 2020 – present

Columnists: Alane M. de Lima, MSc, Heloise A. Tives, MSc, and Sílvia A. Bim, PhD.

- Column “Personalidades da Computação”
  - The column presents the history of remarkable people in Computer Science. The goal is to show that Computer Science and Technology are diverse, breaking stereotypes about gender, race, sexual orientation, and age.
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## VOLUNTEER EXPERIENCE

### Ambassador, Meninas in Tech LBTQ+ (Fly Educação)

MARCH 2022 – present

- The non-governmental organization NGO Fly Educação aims to bring education closer to Latin American people in vulnerable situations. The NGO organizes courses based on technical training combined with socio-emotional and cognitive development. One of its projects is the Meninas in Tech LBTQ+, which seeks to bring opportunities for insertion in technology to girls and women who identify themselves in this community.
- The mission of the ambassador is to support the students of the project, to announce the project in person and in media, and to contribute to their education by sharing knowledge and professional tips.

### Lego Mindstorms Course Instructor, Flipside Brazil, Curitiba

OCTOBER 2016

- Team volunteer (roadie) at Roadsec Curitiba 2016 Information Security Conference.
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## ACADEMIC AND OUTREACH TALKS

- **Sample Complexity in Graph Problems.** Canadian Discrete and Algorithmic Mathematics Conference, Canadian Mathematical Society. Ottawa-Canada (virtual), 2021.
- **An Introduction to the Study of Social and Economic Networks.** Emílias Armações em Bits Project, Federal University of Technology – Paraná (UTFPR). Curitiba-Brazil, 2021.
- **Understanding how Google Search Algorithm Works: an Introduction to the Field of Social and Complex Networks.** Girls in Science Meeting (Meninas nas Exatas: Por Elas para Todos), Federal University of Paraná (UFPR). Curitiba-Brazil, 2021.
- **How to Prepare and Present a Scientific Paper.** School in Research Methodology in Computer Science (Escola de Inverno PPGC/UFF), Fluminense Federal University (UFF). Niterói-Brazil, 2020.
- **Inspired by Ada – The History of Theoretical Computer Science and the Contribution of Women in the Field.** Girls in Science Meeting (Meninas nas Exatas: Por Elas para Todos), Federal University of Paraná (UFPR). Curitiba-Brazil, 2020.
- **Sample Complexity in Graph Problems.** XV Summer School in Discrete Mathematics (XV Escuela de Verano en Matemáticas Discretas), Center for Mathematical Modeling, Universidad de Chile. Valparaiso-Chile, 2020.
- **From The Search for Truth to Computability: The Beginning.** VIII Jornada de Atualização em Informática – JAI, Midwestern State University (UNICENTRO). Guarapuava-Brazil, 2019.