Raul Wayne Teixeira Lopes

Email: raul.wayne@gmail.com, raul.lopes@ens.psl.eu
ORCID: 0000-0002-7487-3475
Website: raulwlopes.com
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Education and positions

11/2022 - current	**Postdoctoral researcher in Computer Science.** With Pierre Aboulker. Theory, ALgorithms, Graphs, and Optimization - TALGO, École normale supérieure, Paris, France.
10/2021 - 10/2022	**Postdoctoral researcher in Computer Science.** With Eunjung Kim. Laboratoire d'Analyse et de Modélisation de Systèmes pour l'Aide à la Décision - LAMSADE, Université Paris-Dauphine, CNRS UMR7243.
2017 - 2021	**Ph.D. in Computer Science.** Under the supervision of Victor Campos. *Disjoint paths and the Grid Theorem in digraphs.* Universidade Federal do Ceará, UFC, Fortaleza, Brazil.
2015 - 2017	**Master's degree in Computer Science.** Under the supervision of Victor Campos. *Turán number for disjoint copies of graphs.* Universidade Federal do Ceará, UFC, Brazil.
2011 - 2014	**Bachelor's degree in Computer Science.** Universidade Federal do Ceará, UFC, Brazil.

Internships

09/2018 - 08/2019	**Ph.D. internship.** Under the supervision of Ignasi Sau. *Relaxations of the Directed Disjoint Paths problem.* Laboratoire d'Informatique, de Robotique et de Microélectronique de Montpellier - LIRMM, Montpellier, France.
09/2016 - 11/2016	**Internship student.** Under the supervision of Frédéric Havet. *Subdivisions in directed graphs with large chromatic number.* Institut National de Recherche en Informatique et en Automatique - INRIA, Sophia Antipolis, France.

Languages

Portuguese	Native language.
English	Proficient.

Research Interests

- Graph theory.
- Algorithms.
- Parameterized complexity.
- Digraphs.
- Temporal graphs.

Publications

1 **A proof for a conjecture of Gorgol.**
V. Campos and **R. Lopes**.
Short version in *Proc. of the VIII Latin and American Algorithms, Graphs and Optimization Symposium (**LAGOS**), volume 50 of ENTCS, pages 367-372, **2015**.*
doi: 10.1016/j.endm.2015.07.061.
Full version in *Discrete Applied Mathematics (**DAM**), volume 245, pages 202–207, **2018**.*
doi: 10.1016/j.dam.2017.04.012.

2 **Bispindles in strongly connected digraphs with large chromatic number.**
F. Havet, N. Cohen, **R. Lopes,** and W. Lochet.
https://arxiv.org/abs/1703.02230.
Short version in *Proc. of the IX Latin and American Algorithms, Graphs and Optimization Symposium (**LAGOS**), volume 62 of ENTCS, pages 69-74, **2017**.*
doi: 10.1016/j.endm.2017.10.013.
Full version in *Electronic Journal of Combinatorics (**E-JC**), volume 25 (2), **2018**.*
doi: 10.37236/6922.

3 **Adapting the Directed Grid Theorem into an FPT algorithm.**
V. Campos, **R. Lopes**, A. K. Maia, and I. Sau.
https://arxiv.org/abs/2007.07738.
Short version in *Proc. of the X Latin and American Algorithms, Graphs and Optimization Symposium (**LAGOS**), volume 346 of ENTCS, pages 229-240, **2019**.*
doi: 10.1016/j.entcs.2019.08.021.
Full version in *SIAM Journal on Discrete Mathematics (**SIDMA**), volume 33 (3), **2022**.*
doi: 10.1137/21M1452664.

4 **A relaxation of the Directed Disjoint Paths problem: a global congestion metric helps.**
R. Lopes and I. Sau.
https://arxiv.org/abs/1909.13848.
Short version in *Proc. of the 45th International Symposium on Mathematical Foundations of Computer Science (**MFCS**), volume 170 of LIPIcs, pages 68:1-68:15, **2020**.*
Full version in *Theoretical Computer Science (**TCS**), volume 898, pages 75-91, 2022.*
doi: 10.1016/j.tcs.2021.10.023.

5 **Edge-disjoint branchings in temporal graphs.**
V. Campos, **R. Lopes**, A. Marino, and A. Silva.
https://arxiv.org/abs/2002.12694.
Short version in *Proc. of the 31st International Workshop on Combinatorial Algorithms (**IWOCA**), volume 12126 of LNCS, pages 112-115, **2020**.*
doi: 10.1007/978-3-030-48966-3_9.
Full version in *Electronic Journal of Combinatorics (**E-JC**), volume 28 (4), **2021**.*
doi: 10.37236/10229.

6 **Coloring problems on bipartite graphs of small diameter.**
V. Campos, G. Gomes, A. Ibiapina, **R. Lopes**, I. Sau, and A. Silva.
https://arxiv.org/abs/2004.11173.
Full version in *Electronic Journal of Combinatorics (**E-JC**), volume 28 (2), **2021**.*
doi: 10.37236/9931.

7 **From branchings to flows: a study of an Edmonds' like property to arc-disjoint branching flows.**
C. Carvalho, J. Costa, C. Sales, **R. Lopes**, A. K. Maia, and N. Nisse.
https://hal.inria.fr/hal-03031759.
Full version to appear in *Discrete Mathematics and Theoretical Computer Science (**DMTCS**).*

8 **Parameterized algorithms for Steiner Tree and Dominating Set: bounding the leafage by the vertex leafage.**
C. M. H. de Figueiredo, **R. Lopes**, A. A. de Melo, and A. Silva.
Short version in *Proc. of the 16th International Conference and Workshops on Algorithms and Computation (**WALCOM**), pages 251–262, **2022**.*
doi: 10.1007/978-3-030-96731-4_21.

9 **Twin-width VIII: delineation and win-wins.**
É. Bonnet, D. Chakraborty, E. Kim, N. Köhler, **R. Lopes**, and S. Thomassé.
https://arxiv.org/abs/2204.00722.
Short version to appear in *Proc. of the 17th International Symposium on Parameterized and Exact Computation (**IPEC**), **2022**.*

10 **Menger's Theorem for Temporal Paths (Not Walks).**
A. Ibiapina, **R. Lopes**, A. Marino, A. Silva.
https://arxiv.org/abs/2206.15251.
Short version currently under review.

Talks and participation in events

2015 **Congress**
*VIII Latin and American Algorithms, Graphs and Optimization Symposium (**LAGOS**), 2015.*
Given talk: A Proof for a Conjecture of Gorgol.

2016 **Workshop**
*Bordeaux Graph Workshop (**BGW**), 2016.*
Given talk: A Proof for a Conjecture of Gorgol.

2016 **School**
São Paulo School of Advanced Science on Algorithms, Combinatorics and Optimization.
Poster presentation: A Proof for a Conjecture of Gorgol.
Courses taken:

- The regularity method and blow-up lemmas for sparse graphs.
- The perfect matching polytope, solid bricks and the perfect matching lattice.
- Recent progress in approximation algorithms for the Traveling Salesman problem.
- Coloring sparse graphs with few colors.
- The method of hypergraph containers.

2018 **Workshop**
*VIII Latin American Workshop on Cliques in Graphs (**LAWCG**), 2018.*
Given talk: Directed tree-width is FPT.

2019 **Congress**
*45th International Workshop on Graph-Theoretic Concepts in Computer Science (**WG**), 2019.*
Member of the organizing committee.

2020 **Congress**
*31st International Workshop on Combinatorial Algorithms (**IWOCA**), 2020.*
Given talk: Edge-disjoint branchings in temporal graphs.

2020 **Congress**
*45th International Symposium on Mathematical Foundations of Computer Science (**MFCS**), 2020.*
Given talk: A relaxation of the Directed Disjoint Paths problem: a global congestion metric helps.

2021 **Talk**
Invited online presentation at the Max Planck Institute for Informatics (MPI).
Given Talk: Adapting the Directed Grid Theorem into an FPT algorithm.

2021 **Talk**
Invited online presentation at the IBS Discrete Mathematics Group (DIMAG) Virtual Discrete Math Colloquium, 2021.
Given Talk: Adapting the Directed Grid Theorem into an FPT algorithm.

2022 **Congress**
*17th International Symposium on Parameterized and Exact Computation (**IPEC**).*
Given talk: Twin-width VIII: delineation and win-wins.

Journal and conference reviews

- STACS ‘23.
- SODA ‘22.
- ESA ‘22.
- MFCS ‘22.
- ISAAC ‘21.
- IPEC ‘21.
- ICTS ‘21.
- IWOCA ‘20.
- LATIN ‘20.
- WG ‘18.
- Algorithmica ‘21.