Daniela Lubke

Researcher at IDados
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Education

2014-2019 **D.Sc. in Systems Engineering and Computer Science**, *Federal University of Rio de Janeiro - UFRJ.*

- Thesis (in Portuguese):"Relaxações Convexas e Desigualdades Válidas para o Problema da Mochila Quadrático Binário."
- Advisor: Marcia Fampa.

2012-2014 **M.Sc. in Systems Engineering and Computer Science**, *Federal University of Rio de Janeiro - UFRJ.*

- Dissertation (in Portuguese): "Cobertura de Corpos por Esferas utilizando Suavização Hiperbólica."
- Advisor: Adilson Elias Xavier.

2007-2011 **B.Sc. in Mathematics**, *Federal Rural University of Rio de Janeiro - UFRRJ.*

Work experience

2018-to date **Optimization Researcher**, *at IDados*, Rio de Janeiro, RJ.
Main projects:

- School bus routing problem: solve the real-world problem using optimizations techniques.
- Redesigning the public school's system: Modeling and proposing solutions for problems in public education.
- Data Analysis: Exploratory analysis of Brazilian public school census data.
- Financial and Economic Analysis: Analysis of building new schools and expanding existing schools.

Research Interests

- Combinatorial Optimization
- Semidefinite Programming
- Mixed-Integer Nonlinear Programming

Publications

Articles in Scientific Journals

- Fampa, M.; **LUBKE, D.**; WANG, F.; WOLKOWICZ, H. *Parametric Convex Quadratic Relaxation of the Quadratic Knapsack Problem.* EUROPEAN JOURNAL OF OPERATIONAL RESEARCH, v. 1, p. 1, 2019. https://doi.org/10.1016/j.ejor.2019.08.027.

  ★ This article was selected a highlighted article of EJOR in January 2020. https://www.journals.elsevier.com/european-journal-of-operational-research/highlighted-articles/ejor-editors-choice-articles-january-2020.

- **LUBKE, DANIELA CRISTINA**; XAVIER, VINICIUS LAYTER; VENCESLAU, HELDER MANOEL; XAVIER, ADILSON ELIAS. *Flying elephants method applied to the problem of covering solid bodies with spheres*, Int. J. Metaheuristics, Vol. 7, No. 1, 2018. https://doi.org/10.1504/IJMHEUR.2018.091868.

- VENCESLAU, HELDER MANOEL; **LUBKE, DANIELA CRISTINA**; XAVIER, ADILSON ELIAS. *Optimal covering of solid bodies by spheres via the hyperbolic smoothing technique*, Optimization Methods and Software (Online), v. 1, p. 1-13, 2014. https://doi.org/10.1080/10556788.2014.934686.

Papers presented in conferences

- COSTA, M.; FAMPA, M.; **LUBKE, D. C.** *Upper bounds for the binary quadratic knapsack problem*, Publicado em anais do XLVII Simpósio Brasileiro de Pesquisa Operacional, 2015, Porto de Galinhas, Pernambuco. http://www.din.uem.br/sbpo/sbpo2015/pdf/142864.pdf.

- **LUBKE, DANIELA CRISTINA**; VENCESLAU, HELDER MANOEL; XAVIER, ADILSON ELIAS. *Solution of the Problem of Covering Solid Bodies by Spheres using the Hyperbolic Smoothing Technique*, Publicado em anais do XLVI Simpósio Brasileiro de Pesquisa Operacional, 2014, Salvador, Bahia. v.1 p. 2686-2694. http://www.din.uem.br/sbpo/sbpo2014/pdf/arq0388.pdf.

- **LUBKE, D. C.**; XAVIER, A. E.; OLIVEIRA, A. A. F.; XAVIER, V. L. *Cobertura de corpos por esferas utilizando suavização hiperbólica.* Publicado em anais do XLV Simpósio Brasileiro de Pesquisa Operacional, 2013, Natal. v.1 p. 2658-2665. http://www.din.uem.br/sbpo/sbpo2013/pdf/arq0295.pdf.

Summary published in proceedings of conferences

- M. Fampa, **D. Lubke**, F. Wang, H. Wolkowicz, *"Convexification of the Quadratic Knapsack Problem with Integrated Cut Strengthening"* Oberwolfach Reports 26 (2019), pp. 19-21. (Proceedings of the workshop on Mixed-integer Nonlinear Optimization: a hatchery for modern mathematics, Mathematisches Forschungsinstitut, Oberwolfach, Germany, 2019). DOI: 10.4171/OWR/2019/26

- Fampa, M. ; **Lubke, D. C.** ; Wang, F. ; Wolkowicz, H. . *Extending cover inequalities for the quadratic knapsack problem to relaxations in lifted space.* In: CLAIO 2018 - XIX Latin-Iberoamerican Conference on Operations Research, Lima. Proceedings of CLAIO 2018 - XIX Latin-Iberoamerican Conference on Operations Research, 2018. http://www.sopios.org.pe/static/claio/proceeding.pdf.

- VENCESLAU, HELDER MANOEL; **LUBKE, DANIELA CRISTINA**; XAVIER, ADILSON ELIAS. *The Hyperbolic Smoothing Technique applied to the covering of three dimensional bodies by spheres*, 2014, Perpignan, France, June 26-28, Book of Abstracts of EUROPT-2014, v. 1. p. 33-33.

- XAVIER, A. E. ; OLIVEIRA, A. A. F. ; **LUBKE, D. C.** ; XAVIER, V. L. *Optimal Covering of a Solid Body via Hyperbolic Smoothing Technique*, 2013, Florence, Italy, June 26-28, Annals EUROPT 2013. v. 1. p. 31-31.

Conferences, Meetings and Workshops

Conference Presentations

July 2017 **ADMM for the SDP relaxation of the QAP and QKP**, *XIX International Conference on Integer Programming and Combinatorial Optimization IPCO*, Waterloo - Canada.

August 2015 **Upper bounds for the binary quadratic knapsack problem**, *XLVII Simpósio Brasileiro de Pesquisa Operacional - SBPO*, Porto de Galinhas, Pernambuco.

June 2015 **Covering of Solid Bodies by Spheres via Flying Elephants Method**, *11th Metaheuristics International Conference*, Agadir - Marrocos.

Setember 2014 **Solving Medium and Large Size Problems of the Literature by the Accelerated Hyperbolic Smoothing Clustering Method**, *XLVI Simpósio Brasileiro de Pesquisa Operacional*, Salvador, Bahia.

Setember 2014 **Solution of the Problem of Covering Solid Bodies by Spheres using the Hyperbolic Smoothing Technique**, *XLVI Simpósio Brasileiro de Pesquisa Operacional*, Salvador, Bahia.

Events

August, 2018 **VII Latin American Workshop on Cliques in Graphs**, *Rio de Janeiro.*

June, 2017 **Workshop on Modern Convex Optimization and Aplications: AN70**, *Toronto - Canada.*

November, 2010 **IV Semana da Matemática do IM, UFRRJ**, *Nova Iguaçu.*

July, 2010 **X Encontro Nacional de Educação Matemática**, *Salvador, Bahia.*

April, 2009 **IV Encontro de Educação Matemática de Ouro Preto**, *Ouro Preto, MG.*

November, 2009 **III Semana da Matemática do IM, UFRRJ**, *Nova Iguaçu.*

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November, 2008 **II Semana da Matemática do IM, UFRRJ**, *Nova Iguaçu.*

November, 2007 **I Semana da Matemática do IM, UFRRJ**, *Nova Iguaçu.*

Scholarships

2014 - 2018 **Ph.D. Fellowship**, *Brazilian Science and Technology Council (CNPq).*

2017 **Scholarship to conduct part of doctoral research as a Visiting Student at University of Waterloo**, *Coordination for the Improvement of Higher Education Personnel (CAPES).*

2013 - 2018 **Fellowship for researchers of the Optimization Lab - UFRJ**, *Power Systems Research - PSR.*

2012 - 2014 **M.Sc. Fellowship**, *Coordination for the Improvement of Higher Education Personnel (CAPES).*

Language Skills

- Portuguese: Mother Tongue.
- English: Advanced.

Computer skills

- Python
- Matlab and R
- Softwares de Otimização: Xpress, Gurobi, Mosek, AMPL.

References

- **Professor Nelson Maculan**
  COPPE - Department of Systems Engineering and Computer Science
  Federal University of Rio de Janeiro, RJ, Brasil
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- **Professora Marcia Fampa**
  COPPE - Department of Systems Engineering and Computer Science
  Federal University of Rio de Janeiro, RJ, Brasil
  fampa@cos.ufrj.br

- **Professor Henry Wolkowicz**
  Department of Combinatorics and Optimization
  University of Waterloo, Canada
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- **Professor Luidi Simonetti**
  COPPE - Department of Engenharia de Sistemas e Computação
  Federal University of Rio de Janeiro, RJ, Brasil
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- **Professora Ana Flavia Uzeda Macambira**
  CCEN - Department of Statistics
  Federal University of Paraíba, João Pessoa, Brasil
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