

# 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*, with collaborative period in University of Waterloo. Advisor: Henry Wolkowicz.
- 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*.

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## 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.

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## Research Interests

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

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## 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, 2020. <https://doi.org/10.1016/j.ejor.2019.08.027>.
- ★ This article was selected a highlighted article of European Journal of Operational Research 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.

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## 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 Applications: 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*.
- November, 2008 **II Semana da Matemática do IM, UFRRJ**, *Nova Iguaçu*.
- November, 2007 **I Semana da Matemática do IM, UFRRJ**, *Nova Iguaçu*.

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## 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)*.

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## Language Skills

- Portuguese: Mother Tongue.
- English: Advanced.

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## Computer skills

- Python
- Matlab and R
- Optimization solvers: Xpress, Gurobi, Mosek, AMPL.

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## References

- **Professor Nelson Maculan**  
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Federal University of Rio de Janeiro, RJ, Brazil  
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- **Professor Marcia Fampa**  
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- **Professor Henry Wolkowicz**  
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- **Professor Ana Flavia Uzeda Macambira**  
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