Filipe Cabral

Personal data

Languages Native: Portuguese, Fluent: English.

Work address 755 Ferst Dr. NW, Atlanta, GA 30318.

Phone +1 404 518-5675

Email fcabral3@gatech.edu

Education

2019–Present **Ph.D. in Operations Research**, *H. Milton Stewart School of Industrial and Systems Engineering*, Georgia Institute of Technology..

2016–2017 **M.Sc. in Mathematics**, *Institute of Mathematics*, Federal University of Rio de Janeiro.

2013–2016 **M.Sc. in Mechanical Engineering**, *Alberto Luiz Coimbra Institute for Graduate Studies and Research in Engineering*, Federal University of Rio de Janeiro.

2009–2012 **B.Sc. in Applied Mathematics**, *Institute of Mathematics*, Federal University of Rio de Janeiro.

Experience

2014–2019 **Power System Analyst**, Brazilian Power System Operator (ONS), Rio de Janeiro–Brazil.

- Development of decision under uncertainty models for power systems planning.
- Time series analysis applied to load forecasting, energy inflows, and wind generation.

2014–2016 **ONS-GaTech Technical Agreement**, Brazilian Power System Operator (ONS), Rio de Janeiro–Brazil.

Agreement led by Professor Alexander Shapiro to study minimum operational storage energy target, CVaR parameters definition, and marginal cost smoothing.

2017–2019 **ONS-UFRJ Technical Agreement**, Brazilian Power System Operator (ONS), Rio de Janeiro–Brazil.

Agreement led by Professor Bernardo da Costa to investigate ways to represent and evaluate the performance of non-convex operational planning constraints.

Research Interests

Stochastic Programming, Integer Programming, Convex Analysis, Reinforcement Learning.

Master of Science in Mechanical Engineering

Title *A Proposal of a Periodic Vector Autoregressive Multiplicative Model for Scenario Generation of Inflows Applicable to the Brazilian Power System Operation Planning* (in Portuguese)

Advisor Professor Jose Herskovits Norman

Description We proposed a model with non-negative support that meets the linearity and stagewise independent requirements of the SDDP algorithm. The main motivation was that negative scenarios generated by standard autoregressive additive error models induce infeasibilities in the operational planning stochastic programming model.

URL `http://fcabral3.github.io/files/Theses/fcabral_master_mechanical_eng.pdf`

Master of Science in Mathematics

Title *The Role of Extreme Points for Convex Hull Operations*

Advisor Professor Bernardo Freitas Paulo da Costa

Description We presented in a unified way two results which lie in the core of two widely used algorithms for non-convex programming: the classical Balas's Theorem about the convex hull of union of polyhedra, and the more recent "Blessing of Binary" theorem from Zou, Ahmed and Sun. We also provided a corrected proof for an important theorem in Generalized Disjunctive Programming (S. Ceria and J. Soares, 1999).

URL `http://fcabral3.github.io/files/Theses/fcabral_master_math.pdf`

Publications

2020 **S. Ahmed, F. Cabral, B. da Costa**, Stochastic Lipschitz Dynamic Programming, *Mathematical Programming, 2020:* `https://link.springer.com/article/10.1007/s10107-020-01569-z`.

Proceedings

2018 **F. Cabral, B. da Costa, J. da Costa**, Use of Disjunctive Constraints To Represent Risk Aversion Policies, *Conference Paper*, SEPOPE 2018, Recife–Brazil: `http://fcabral3.github.io/files/Proceedings/XIV-SEPOPE-Paper.pdf`.

Technical Reports

2019 **B. da Costa, I. de Freitas, R. Klausner, F. Cabral, J da Costa, D. Penna**, Aceleração de Convergência para problemas de Otimização estocástica multiestágio (in Portuguese), *Technical Report*: `http://fcabral3.github.io/files/Technical_Reports/ONS-2019.pdf`.

2017 **F. Cabral, B. da Costa**, Nested Distance for Stagewise Independent Process, *Manuscript in ArXiv*: `https://arxiv.org/abs/1711.10633`.

2016 **A. Shapiro, L. Ding, F. Cabral, J. da Costa**, Marginal cost smoothing, *Technical Report*: `http://fcabral3.github.io/files/Technical_Reports/ONS-2016.pdf`.

2015 **A. Shapiro, F. Cabral, J. da Costa**, Guidelines for choosing parameters λ and α for the AVaR risk averse approach, *Technical Report*: `http://fcabral3.github.io/files/Technical_Reports/ONS-2015.pdf`.

2014 **A. Shapiro, F. Cabral, J. da Costa**, Investigation of the AVaR and minimum storage energy target levels approach, *Technical Report*: `http://fcabral3.github.io/files/Technical_Reports/ONS-2014.pdf`.

Presentations

ILAS-2019 **F. Cabral, S. Ahmed, B. da Costa**, The Stochastic Lipschitz Dynamic Programming (SLDP) algorithm, Rio de Janeiro–Brazil.

ISMP-2018 **F. Cabral, B. da Costa, J. da Costa**, The Role of Extreme Points for Convex Hull Operations, Bordeaux–France.

ISMP-2018 **B. da Costa, F. Cabral, J. da Costa**, Using Disjunctive Programming to Represent Risk Aversion Policies, Bordeaux–France.

SEPOPE-2018 **F. Cabral, B. da Costa, J. da Costa**, Use of Disjunctive Constraints to Represent Risk Aversion Policies, Recife–Brazil.

Invited talks

2018 The Role of Extreme Points for Convex Hull Operations, Institute of Pure and Applied Mathematics (IMPA), Rio de Janeiro–Brazil

2018 The Role of Extreme Points for Convex Hull Operations, Faculty of Mathematics, Technical University of Munich (TUM), Munich–Germany.

2016 Research Status for Technical Cooperation between ONS and ISyE/GaTech Technical Agreement, ONS/ISyE Gatech Workshop, Rio de Janeiro–Brazil.

Conferences and Workshops

2018 Symposium of Specialists in Electric Operational and Expansion Planning - SEPOPE 2018, Recife–Brazil.

2018 International Symposium on Mathematical Programming - ISMP 2018, Bordeaux–France.

2016 International Congress on Stochastic Programming - ICSP 2016, Buzios–Brazil.

2016 Stochastic Variational Analysis - SVAN 2016, Rio de Janeiro–Brazil.

2013 Research in Optimization and Statistics, EMAp/FGV, Rio de Janeiro–Brazil.

2012 International Conference on Engineering Optimization - EngOpt 2012, Rio de Janeiro–Brazil.

Teaching Experience

2020 Teaching assistant – Engineering Optimization, ISyE-Gatech.

2019 Teaching assistant – Supply Chain Modeling: Logistics, ISyE-Gatech.
2018 Instructor – 30 hours Statistics seminar, ONS.
2017 Teaching assistant – 40 hours course of Gaussian Process, ONS.
2012 Teaching assistant – 40 hours course of Calculus II, DMA-UFRJ.

Computer skills

Python, Julia, R, MatLab, Bash, Unix, Git, LaTeX

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☎ +1 404 518-5675 • ✉ fcabral3@gatech.edu