

Diego Fonseca

Curriculum Vitae

Personal information

First Names and Last Names: *Diego Fernando* Fonseca Valero.

Research Interest

Stochastic Optimization, Optimal transport, Statistics, Mathematical Finance.

Education

- 2019–2023 **Ph.D. Mathematics** , *Universidad de los Andes* , .
Thesis: Distributionally Robust Optimization: A Novel Approach with Decision-Dependent Ambiguity Sets and an Application to Mode Estimation.
Advisor: Mauricio Junca.
- 2016–2018 **M.Sc. Mathematics** , *Universidad de los Andes* , .
Thesis: Robust Distributional Optimization with Wasserstein metrics and some applications.
Advisor: Mauricio Junca.
- 2011–2015 **B.S. Mathematics** , *Universidad nacional de Colombia* , .
Thesis: Dynamic of Hénon map.
Advisor: Serafin Bautista.

Research, preprints and publications

- Submitted *Decision-dependent Distributionally Robust Optimization*, Joint work with Mauricio Junca. Submitted to Operations Research Letters. arXiv:2303.03971, 2023
- Submitted *Wasserstein Distributionally Robust Optimization with Expected Value Constraints*, Joint work with Mauricio Junca. Submitted to Computers and Operations Research. arXiv:2111.04663, 2023
- Preprint *Mode estimation via Optimal Transport metric*, Joint work with Mauricio Junca and Marco Avella. 2022

Department of mathematics.

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Presentations, Proceedings, and Talks

- 2018 *Data-driven distributionally robust optimization applied to probability density estimation and portfolio optimization*. Poster session presented at IX PanAmerican Workshop in applied mathematics and computational science, Varadero, Cuba, July 2018.
- 2018 *Data-driven Robust Distributional Optimization applied to estimation of probability density functions and portfolio optimization*. Talk at Primer Congreso Colombiano de Matemáticas Aplicadas e Industriales (MAPI-1), Bogotá, Colombia, August 2018.
- 2019 *Data-driven distributionally robust optimization applied to portfolio optimization*. Talk at Third International Congress on Actuarial Science and Quantitative Finance, Manizales, Colombia, July 2019.
- 2022 *Mode estimation applied to clustering and scenario reduction via Optimal Transport metric*. Talk at Segundo Congreso Colombiano de Matemáticas Aplicadas e Industriales (MAPI-2), Bogotá, Colombia, June 2022.
- 2023 *Probability minimization using Decision-Dependent Distributionally Robust Optimization*. Poster at Latin American Congress of Probability and Mathematical Statistics (XVI CLAPEM), São Paulo, Brazil, July 2023.

Accomplishments

- 2016-present Graduate Assitance at Universidad de Los Andes.

Conferences and Workshops attended

- 2017 Terceras Jornadas de probabilidad y Procesos Estocásticos, Bogotá, Colombia, August 2017.
- 2017 Matematicas por estudiantes, Bogotá, Colombia, November 2017.
- 2018 IX PanAmerican Workshop in applied mathematics and computational science, Varadero, Cuba, July 2018.
- 2018 Primer Congreso Colombiano de Matemáticas Aplicadas e Industriales (MAPI-1), Bogotá, Colombia, August 2018.
- 2019 Third International Congress on Actuarial Science and Quantitative Finance (ICASQF), Manizales, Colombia, July 2019.
- 2022 Segundo Congreso Colombiano de Matemáticas Aplicadas e Industriales (MAPI-2), Bogotá, Colombia, June 2022.
- 2023 Latin American Congress of Probability and Mathematical Statistics (XVI CLAPEM), São Paulo, Brazil, July 2023.

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Organized Seminars

- *Statistics, Control and Optimization seminar*, Colombia, Universidad de los Andes, (coorganized with Prof. Mauricio Junca and Prof. Mauricio Velasco from Universidad de los Andes), August 2018-December 2018.
- *Optimal Transport seminar*, Colombia, Universidad de los Andes, (coorganized with Prof. Mauricio Junca from Universidad de los Andes), February 2023-May 2023.

Computer skills

MATLAB, R, PYTHON, L^AT_EX

Professional Experience

Research Experience.

- Department of statistics, **Columbia University**, *New York, USA*, **Research Intern**, September 2022-December 2022.
- Department of mathematics, **Universidad de los Andes**, *Bogotá, Colombia*, **Research Assistant**, May 2016-July 2016, May 2017-July 2017.

Teaching Experience at Universidad de los Andes, Bogotá, Colombia.

2016–Present **Courses.**

- **MATE-1105** *Linear Algebra 1*, **TA**, 1st and 2nd Semesters 2016.
- **MATE-1214** *Integral Calculus with Differential Equations*, **TA**, 1st Semester 2017, 1st Semesters 2018, 1st Semester 2022, 1st Semester 2023.
- **MATE-1203** *Diferential calculus*, **TA**, 2nd Semester 2018.
- **MATE-1253** *Calculus 3 with Linear algebra 1*, **TA**, 2nd Semester 2019.
- **MATE-1252** *Integral Calculus with Probability*, **TA**, 1st and 2nd Semesters 2019, 1st and 2nd Semesters 2020, 1st Semester 2021, 1st Semester 2023.

Teaching Experience at Universidad Nacional de Colombia, Bogotá, Colombia.

2015 **Courses.**

- **MATE-1000001** *Math basic (Precalculus)*, **TA**, 1st and 2nd Semesters 2015.

Outreach

2014-2015 **Mathematics Tutor, CoCoA Project, Universidad Nacional de Colombia:** Engaged in this educational initiative aimed at underprivileged students, fostering virtual mathematics learning. Roles included forum moderation, creating instructional materials, delivering in-person tutoring, and providing insightful feedback.

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