John E. Fontecha

Operations Research and Data Science

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Goal: seeking internship opportunities for 2020 as Operations Research Scientist/Data Scientist.
Dedicated, collaborative, and dynamic engineer with a strong background in mathematical modeling and statistics
Highly passionate about recognizing, framing, and solving problems using analytics techniques
Experience developing models and algorithms for a wide variety of applications

Education

Ph.D., Operations Research, University at Buffalo, GPA - 3.96/4.0. *Expected - May 2021*

M.Sc., Industrial Engineering, Universidad de Los Andes, GPA - 4.0/4.0. *October 2015*

B.Sc., Chemical Engineering, Universidad de Los Andes, GPA - 3.12/4.0. *September 2008*

Relevant coursework: Design and Analysis of Algorithms, Linear Optimization, Non-Linear Optimization, Advanced Optimization, Network Flows, Discrete Optimization, Logistics Optimization, Stochastic Programming, Linear Statistical Models, Advanced Data Analytics & Predictive Modeling, Stochastic Models, Probabilistic Models, Probabilistic Methods, Advanced Quality Control, Design of Experiments, Energetic Economy.

Technical Skills

Programming and software packages: Java, Python, C++, R, VBA, Gurobi, Mosel/Xpress-MP, Cplex, GAMS, AMPL, SAS, scikit-learn, imbalanced-learn, Tableau, Latex, SQL, Excel, Mathematica, Matlab.

Languages: Spanish (native speaker), English (professional proficiency).

Selected Research Experience

Data-driven optimization for the stochastic distribution of incentives to maximize behavior/product adoption. *Fall 2017 - Ongoing*

- Developed a mathematical model for reach-driven social influence maximization.
- Solved the mathematical model by means of Column Generation.
- Outcome: an increase of up to 30% in the number of new adopters compared to pure random distribution of incentives. ***Submitted paper.***

Spatial allocation of green infrastructure in urban space. *Fall 2016 - Spring 2018*

- Developed two-stage stochastic mixed-integer programs for green infrastructure allocation and design.
- Outcome: a decrease in nearly 50% of the potable water used for irrigation purposes. ***Published paper.***

Combined maintenance and routing (CMR) optimization for large-scale instances. *Summer 2014 - Summer 2017*

- Developed a methodology for the maintenance planning of geographically distributed sites under dynamic limited-crew routing.
- Outcome: reduction of nearly 20% in the maintenance cost respect to the current policy. ***Published paper.***

Hydrocarbon pipeline valve location under environmental and social constraints. *Summer 2014 - Spring 2015*

- Re-designed and re-implemented the peak leak calculator reducing its running time in more than 99%.
- Developed and solved a mathematical model by using a shortest path algorithm.
- Outcome: reductions in the order of 50%–85% of the spill volume. ***Published paper.***

Professional Experience

Industrial Engineering Department. Universidad de Los Andes. *June 2015 - May 2016*

Academic support specialist.

- Conducted and led a six-sigma project for improving administrative processes.
- Designed and coded a user-friendly tool for Academic Coordination's most essential and time-consuming task (academic-requirements evaluation), achieving a time reduction of 95%.

Eli Lilly Interamerica inc. affiliated company of Eli Lilly & Co. *December 2008 - January 2013*

S2 sales representative.

B2B assistant sales representative.

Pharmacy sales representative.

- Worked with clients on-site, negotiating and providing insights and strategic advice.
- Identified and brought new clients.
- Got sales revenues superior to 100% of the targeted value consistently.
- Recognized several times as one of the best sales representatives.

Teaching Experience

Instructor at Universidad de Los Andes. *Fall 2015 - Summer 2017*

Decision Support Systems. *Programming course using MS-Excel, VBA, and Access.*

Optimization Principles. *Linear Programming, MIP, XPress-IVE, Gurobi, VBA.*

Probabilistic Models. *Markov Chains, Queueing Theory, and Stochastic Dynamic Programming.*

- Designed class syllabus, exams, projects, homework, and quizzes.
- Lectured classes.
- Advised undergraduate thesis projects.
- Assigned duties and supervised Teaching Assistants (TA).

Teaching Assistant at University at Buffalo and Universidad de Los Andes. *Spring 2013 - Spring 2015 and Fall 2017*

Engineering Economy.
Advanced Optimization.
Optimization Principles.
Bachelor Final Project 1.

- Led other TAs in the development of designated duties.
- Supported the instructors in the development and grading of content.
- Lectured recitation classes.

Volunteer Service & Leadership

President & co-Founder of the Latin American - Graduate Student Association (LatAm-GSA). *Fall 2019 - Spring 2020*

President of Industrial and Systems Engineering - Graduate Student Association (ISE-GSA). *Fall 2019 - Spring 2020*

Vice-president of Industrial and Systems Engineering - Graduate Student Association (ISE-GSA). *Fall 2018 - Spring 2019*

- Directed an advertising strategy to reach out the members of the Latin American community at UB.
- Managed the paperwork to constitute LatAm-GSA.
- Direct overall clubs' operations and staff activities.
- Plan and implement clubs' development strategy.

Event Coordinator of UB Informs chapter. *Fall 2018 - Spring 2019*

- Coordinated all logistical aspects of workshops, seminars, and speaker talks held by the club.

Instructor for Science is Elementary. *Fall 2018*

- Organized materials and led students in performing simple science experiments.

Project Consultant for Meals on Wheels for WNY. *Fall 2018*

- Led a team of 6 members to analyze warehouse utilization.
- Developed a user-friendly VBA tool with dashboards to support decision-making.

Fundraising director for "I want to study" program. *Summer 2006*

- Led 12 promoters in the first fundraising for the benefit of the scholarship program "I Want to Study".

English and Math teacher at "La Giralda" school. *Spring 2005 - Fall 2005*

- Taught on weekend classes for extra academic support to low-income kids.

Computer teacher in Library Network (Biblored). *Spring 2003 - Fall 2004*

- Taught on weekend classes for low-income students at public libraries.

Honors & awards

- Scholarships: 1) Ph.D. Operations Research, 2) M.Sc. Industrial Engineering, 3) B.Sc. Chemical Engineering, and 4) SAS Training Program in Data Science.
- Academic & Research: Travel award for NSF Poster Competition at IMECE (2018), Second place in the master's degree cohort.

Selected Publications

- Torres, M. N., **Fontecha, J. E.**, Zhu, Z., Walteros, J. L., & Rodríguez, J. P. (2019). A participatory approach based on stochastic optimization for the spatial allocation of Sustainable Urban Drainage Systems for rainwater harvesting. *Environmental Modelling & Software*. In Press.
- **Fontecha, J. E.**, Guaje, O., Duque, D., Akhavan-Tabatabei, R., Rodríguez, J. P., & Medaglia A. L. (2019). Combined maintenance and routing optimization for large-scale sewage cleaning. *Annals of Operations Research*. In Press.
- **Fontecha, J. E.**, Akhavan-Tabatabei, R., Duque, D., Medaglia A. L., Torres, M. N., & Rodríguez, J. P. (2016). On the preventive management of sediment-related sewer blockages: a combined maintenance and routing optimization approach. *Water Science & Technology*. 74 (2), 302-308.
- **Fontecha, J. E.**, Cano, N. A., Velasco, N., Muñoz, F. (2016). Optimal sectioning of hydrocarbon transport pipeline by volume minimization, environmental and social vulnerability assessment. *Journal of Loss Prevention in the Process Industries*. 44, 681-689.
- Cano, N. A., **Fontecha, J. E.**, Velasco, N., Muñoz, F. (2016). Shortest path algorithm for optimal sectioning of hydrocarbon transport pipeline. *IFAC-PapersOnLine*. 49 (12), 532-537.

Selected Conferences

- **Fontecha, J. E.,** Jois, M. H. N., Walteros, J. L., Nikolaev, A. (2018). On Incentivized-social-influence-based programs to promote behavioral changes: a case study for incentivizing households to save energy. Informs Annual Meeting 2018. Phoenix, AZ.
- **Fontecha, J. E.**, Duque, D., Akhavan-Tabatabaei, R., Rodríguez, J. P., Medaglia, A. L. (2016). Combined maintenance and routing optimization for large-scale problems. Informs Annual Meeting. Nashville, TN.
- **Fontecha, J. E.**, Duque, D., Akhavan-Tabatabaei, R., Rodríguez, J. P., Medaglia, A. L. (2015). Combined maintenance-routing optimization: the case of a water utility. Informs Annual Meeting. Philadelphia, PA.