Jorge A. Huertas

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Summary

Ph.D. student in Operations Research with 10+ years of experience bridging academia, consulting, and industry, improving large-scale systems in transportation, logistics, and semiconductor manufacturing through optimization, simulation, and machine learning.

Education

Georgia Institute of Technology — **Atlanta, GA, USA**
- **Ph.D. in Operations Research**, Expected graduation: May 7, 2026 — Aug 2020 – Present
  - Advisor: Dr. Pascal Van Hentenryck
- M.Sc. in Operations Research, Graduated Dec 2024 — Aug 2020 – Jun 2024

Arizona State University — **Tempe, AZ, USA**
- Six Sigma - Black Belt, Graduated Dec 2015 — Jan 2015 – Dec 2015

Universidad de los Andes — **Bogotá, Colombia**
- M.Sc. in Industrial Engineering, Graduated Oct 2016 — Jan 2015 – Jun 2016
- B.Sc. in Industrial Engineering, Graduated Mar 2015 — Jan 2011 – Dec 2014
- B.Sc. in Systems and Computing Engineering, Graduated Mar 2015 — Jan 2010 – Dec 2014

Refereed journal publications

Scheduling for Semiconductor Manufacturing

- Constraint programming models for serial batch scheduling with minimum batch size. **Jorge A. Huertas** and Pascal Van Hentenryck. ***Operations Research Perspectives***, Sep 2025. doi: 10.1016/j.orp.2025.100352

- Parallel batch scheduling with incompatible job families via constraint programming. **Jorge A. Huertas** and Pascal Van Hentenryck. ***IEEE Transactions on Semiconductor Manufacturing.***, Aug 2025. doi: 10.1109/TSM.2025.3601510

Transportation and Mobility

- Level of traffic stress-based classification: a clustering approach for Bogotá, Colombia. **Jorge A. Huertas**, Alejandro Palacio, Marcelo Botero, Germán A. Carvajal, Thomas Van Laake, Diana Higuera-Mendieta, Sergio Cabrales, Luis A. Guzmán, Olga L. Sarmiento, and Andrés L. Medaglia. ***Transportation Research Part D: Transport and Environment***, Aug 2020. doi: 10.1016/j.trd.2020.102420

Evacuation Planning

- Pedestrian evacuation planning: unveiling evacuation routes via column generation. Nicolás Cabrera, **Jorge A. Huertas**, and Andrés L. Medaglia. ***EURO Journal on Transportation and Logistics***, Jul 2022. doi: 10.1016/j.ejtl.2022.100089

- Time estimation and hotspot detection in the evacuation of a complex of buildings: a mesoscopic approach and case study. Jony A. Zambrano, **Jorge A. Huertas**, Ethel Segura-Durán, and Andrés L. Medaglia. ***IEEE Transactions on Engineering Management***, Jan 2020. doi: 10.1109/TEM.2019.2960354

- Evacuation dynamics: a modeling and visualization framework. **Jorge A. Huertas**, Daniel Duque, Ethel Segura-Durán, Raha Akhavan-Tabatabaei, and Andrés L. Medaglia. ***OR Spectrum***, Jun 2019. doi: 10.1007/s00291-019-00548-x

Telecommunication Networks

- Addressing cooperation between mobile operators in telecommunication networks via optimization: a lexicographic approach and case study in Colombia. Francisco J. MacAllister, Laura Maya, **Jorge A. Huertas**, Carlos Lozano-Garzón, and Yezid Donoso. ***International Journal of Computers Communications & Control***, Dec 2018. doi: 10.15837/ijccc.2020.6.3975

- Multi-objective tabu search to balance multihoming loads in heterogeneous wireless networks. **Jorge A. Huertas** and Yezid Donoso. ***International Journal of Computers Communications & Control***, Dec 2018. doi: 10.15837/ijccc.2018.6.3360

Health care

- The role of engineering in the COVID-19 pandemic (in Spanish). Paola Betancourt Ruiz, Marcela Guevara Suárez, Marylin Hidalgo, Silvia Restrepo, Erik Potdevin, **Jorge A. Huertas**, Andrés Medaglia, Juan Pedraza, Martha Cepeda, Pablo Arbeláez. ***Revista de Ingeniería***, 2020, Volume 50. doi: 10.16924/revinge.50.1

Conference publications in refereed proceedings

Evacuation Planning

- Large-scale zone-based evacuation planning: generating convergent and non-preemptive evacuation plans via column generation. **Jorge A. Huertas** and Pascal Van Hentenryck. ***Proceedings of the 55th Hawaii International Conference on System Sciences***, Jan 2022. doi: [10.24251/HICSS.2022.307](#)

Articles under review

Transportation and Mobility

- MARTA Reach: pilot of an on-demand multimodal transit system in Atlanta. Pascal Van Hentenryck, Connor Riley, Anthony Trasatti, Hongzhao Guan, Tejas Santanam, **Jorge A. Huertas**, Kevin Dalmeijer, Kari Watkins, Juwon Drake, Samson Baskin. *Under review in **INFORMS Journal on Applied Analytics***, Oct 2023. doi: [10.48550/arXiv.2308.02681](#)

Technical reports

- Two-stage analytics framework for warehouse location for Rappi: a case study in Ciudad de Mexico (Mexico). Ana María Quintero-Ossa, **Jorge A. Huertas**, Carlos Lozano-Garzón, Alejandro Correa-Bahnsen, Yezid Donoso, and Andrés L. Medaglia. ***Technical report, COPA-2021-02***, Universidad de los Andes, 2021. [http://hdl.handle.net/1992/50594](#)

- Solving the time-ahead pricing of energy supply problem with nonlinear utility function for consumers via a bilevel optimization approach. **Jorge A. Huertas**, Daniel M. Eslava, Andrés F. Pardo, and Jaime E. González. ***Technical report, COPA-2014-12***, Universidad de los Andes, 2015. [http://hdl.handle.net/1992/31241](#)

Working papers

Scheduling for Semiconductor Manufacturing

- An aligned constraint programming model for serial batch scheduling with minimum batch sizes. **Jorge A. Huertas** and Pascal Van Hentenryck. *To be submitted to **IEEE Transactions on Semiconductor Manufacturing***, 2025.

- Parallel batch scheduling with family-machine dedications and critical queue times. **Jorge A. Huertas**, JinYoun Lee, and Pascal Van Hentenryck. *To be submitted to **Constraint Programming***, 2025.

Evacuation Planning

- Including evacuation deadlines in large-scale zone-based evacuation plans with convergent paths and non-preemptive schedules. **Jorge A. Huertas** and Pascal Van Hentenryck. 2025.

- A logic-based benders decomposition for large-scale zone-based evacuation planning. **Jorge A. Huertas** and Pascal Van Hentenryck. *To be submitted to **Transportation Science***, 2025.

Awards

XV IISE Latin American Congress   **San José, Costa Rica**
- **Advisor of the best Latin American undergraduate thesis**   Mar 2018
  - Thesis: A Column Generation Approach for Evacuation Planning.
  - Authors: Nicolás Cabrera and **Jorge A. Huertas**
  - Published on: *[EURO Journal on Transportation and Logistics](#)*, Jul 2022.

[7th AIMMS–MOPTA Optimization Modeling Competition](#)   **Bethlehem, PA, USA**
- **Winner**, Coppta team   Aug 2014
  - Proposed a cut-based heuristic to solve the *time-ahead pricing of energy supply* bilevel optimization problem for the Borough of Madison, NJ, USA.
  - Competed against graduate teams from 22 international top universities.
  - Technical report *[COPA-2014-12, Universidad de los Andes](#)*.

Academic experience

Georgia Institute of Technology- H. Milton Stewart School of Industrial and Systems Engineering   **Atlanta, GA, USA**
- **President – Student Leadership Council**, [AI Institute for Advances in Optimization (AI4OPT)](#)   Nov 2022 – Present
  - Organized and led student events across four US institutions, voiced student concerns, and mentored junior students.

- **Graduate Research Assistant**, AI4OPT, and Socially-Aware Mobility Lab   Aug 2020 – Present
  - Improved by 20% semiconductor manufacturing schedules with novel Constraint Programming models that are up to 6x faster than existing methods.
  - Enhanced by 50% the riders' average trip duration (request-to-destination) in four Atlanta areas with limited transit access through the development and deployment of MARTA Reach, an on-demand multi-modal transit system pilot.
  - Increased by 78% the accuracy of large-scale evacuation plans relative to traffic simulations by integrating operationally realistic constraints into optimization models that create them, using mathematical decompositions.
- **Graduate Teaching Assistant**   Aug 2020 – Present
  - Undergraduate course: Constraint Programming.
  - Summer periods: Seth Bonder Camp on Computational and Data Science.

Universidad de los Andes   **Bogotá, Colombia**
- **Researcher**, Center for Optimization and Applied Probability (COPA)   Aug 2016 – Dec 2020
  - Optimized Covid-19 testing procedures through a simulation of the Gen-Core laboratory at Universidad de los Andes.
  - Classified 167k road segments in Bogotá with their Level of Traffic Stress through a machine learning-based methodology (supervised + unsupervised learning), revealing a strong correlation between high-stress roads and cyclist collisions.
  - Enhanced planning process of Bogota's integrated multi-modal transit system with a novel data-driven methodology to estimate origin-destination matrices of trip demands, useful for route design and scheduling.
  - Strengthened by 15% the evacuation efficiency in Bogotá's historic center and the preparedness of a 23k-occupant campus by detecting congestion hotspots with optimization and simulation models that guided infrastructure interventions.
  - Increased by 20% the vertical circulation efficiency in a campus building with 10k+ daily entries by developing a simulation model that guided elevator reconfigurations and stair-use policies.
- **Instructor**, Industrial Engineering Department   Aug 2016 – May 2021
  - Taught master lectures to 200+ students per semester:
    - Undergraduate courses on **optimization**, **simulation**, and data science.
    - Invited modules at graduate-level courses: **large-scale optimization** under uncertainty, **networks flows**, and **simulation**.
    - Youtube channel (Spanish) with 100k+ views: www.youtube.com/@jorge_huertas.
  - Advised and co-advised 30+ academic and industry projects using *Analytics*, OR, and Six Sigma.
- **Teaching Assistant**   Aug 2013 – Jun 2016
  - Undergraduate courses: linear optimization.
  - Graduate courses: Network Flows and Advanced Optimization.

Industry experience

Google   **Sunnyvale, CA, USA**
- **Student Researcher**, Planning Sciences Group - Global Networking – Google Cloud   May 2025 – Aug 2025
  - Reduced by 30% the iterations between optimization and traffic engineering models for global network planning by developing and deploying a new optimization module in the main planning system.

Intel Corporation   **Atlanta, GA, USA**
- **Operations Research Engineering Intern**, Supply Chain Management and Decisions Sciences   May 2022 – May 2024
  - Cut by 45% the runtime of the master production scheduler with a tuning tool for optimization solver parameters.
  - Streamlined troubleshooting time for issues in the master production scheduler by automating conflict analyses.
  - Accelerated by 40% the production planning optimization model through a Column-Generation decomposition.
  - Developed a machine learning-based discrete-event simulation to improve the cycle time prediction in wafer fabs.

Bogotá's Planning Secretariat   **Bogotá, Colombia**
- **Analytics Consultant**, Urban Roads, Transit, and Public Services Division   Mar 2019 – Sep 2019
  - Modernized Bogotá's Master Territory Plan by replacing outdated road classification guidelines with a data-driven methodology (machine learning + GIS) that classified 100k road segments using 2M data points.

The World Bank Group   **Bogotá, Colombia**
- **Analytics Short-Term Consultant**, Transport and ICT   Feb 2018 – Jul 2018
  - Enhanced the urban cycling strategy of Bogotá's Mobility Secretariat and guided infrastructure and safety policy with multi-source data analyses (sensors, GIS, APIs) that covered 475 km of biking network and 172k peak-hour cyclists.

Conference talks

- Parallel batch scheduling with incompatible job families via Constraint Programming. **Jorge A. Huertas** and Pascal Van Hentenryck. IISE Annual Meeting. Jun 2025. **Atlanta**, GA, USA.

- A column-generation approach for wafer fab scheduling. **Jorge A. Huertas**, Ashish Nemani, Zhenying Zhao, and Pascal Van Hentenryck. INFORMS Annual Meeting. Oct 2023. **Phoenix**, AZ, USA.

- Large-scale zone-based evacuation planning: Generating convergent and non-preemptive evacuation plans via column generation. **Jorge A. Huertas** and Pascal Van Hentenryck. INFORMS Annual Meeting. Oct 2021. **Anaheim**, CA, USA.

- Data-driven origin-destination matrix estimation in large-scale integrated public transport systems. Alejandro Palacio, Marcelo Botero, **Jorge A. Huertas**, Carolina Osorio, Andrés L. Medaglia, and Sergio Cabrales. INFORMS Annual Meeting. Oct 2019. **Seattle**, WA, USA.

- Analytics framework to improve building flow dynamics. **Jorge A. Huertas**, Valeria Puyo, Liseth Daniela Grosso, Daniel Cifuentes, Diego Monroy, Maurix Suárez, Andres L. Medaglia. INFORMS Annual Meeting. Oct 2019. **Seattle**, WA, USA.

- Multi-objective tabu search to balance multihoming loads in heterogeneous wireless networks. **Jorge A. Huertas** and Yezid Donoso. Metaheuristics International Conference (MIC). Jul 2019. **Cartagena**, Colombia.

- Modeling evacuation dynamics. **Jorge A. Huertas**, Jony A. Zambrano, Nicolás Cabrera, Daniel Duque, Ethel Segura-Durán, Raha Akhavan-Tabatabaei,and Andrés L. Medaglia. EURO Annual Meeting. Jul 2018. **Valencia**, España.

- A mesoscopic model to evaluate the evacuation dynamics in a university campus. **Jorge A. Huertas**, Jony A. Zambrano, and Andrés L. Medaglia. INFORMS Annual Meeting. Oct 2017. textbfHouston, TX, USA.

- Supporting evacuation decisions via network optimization. **Jorge A. Huertas**, Daniel Duque, Ethel Segura-Durán, Raha Akhavan-Tabatabaei, and Andrés L. Medaglia. INFORMS Annual Meeting. Oct 2016. **Nashville**, TN, USA.

Journal and conference refereeing

- Socio-Economic Planning Sciences (Q1 Journal).
- Conference on Integer Programming and Combinatorial Optimization (IPCO).
- European Conference on Information Systems (ECIS).
- Hawaii International Conference on System Sciences (HICSS).
- Institute of Industrial and Systems Engineering (IISE).

Skills

- **Programming languages**: Java, Python, Visual Basic, C++, OPL, Mosel, JavaScript, C#.
- **Software and solvers**: Gurobi, CPLEX, Xpress, Google OR Tools, Simio, Arena, AIMMS, ArcGIS, QGIS.
- **Tools and frameworks**: Linux, Git, React Native, Meteor.

Languages

Native: Spanish

Fluent: English

Affiliations

INFORMS: Institute for Operations Research and Management Sciences

IISE: Institute of Industrial and Systems Engineering

ASOCIO: Colombian Association of Operations Research

Hobbies and more

Sports: Basketball, Snowboard, and Surf.

Music: Electronic music Dj.
- Soundcloud profile: www.soundcloud.com/jorge_huertas.
- Youtube channel: www.youtube.com/@jorge-huertas.