

PABLO FELIPE ESCALONA RODRÍGUEZ

CONTACT INFORMATION:

Department of Industrial Engineering
Universidad Técnica Federico Santa María
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ACADEMIC BACKGROUND:

- 2018 - 2019 **Inria Lille - Nord Europe Research Centre** (INOCS Team - Integrated Optimization with Complex Structure Team), Lille, France.
- Post-Doctoral Research Visit
 - Theme: *Application of Stackelberg games to avoid fare evasion.*
 - Supervisors: Luce Brotcorne, Bernard Fortz, Martine Labbé.
- 2015 **Universidad de Chile**, Santiago, Chile.
- Ph.D. in Engineering Systems.
 - Thesis: *Integration of inventory control decisions with facility location for several demand classes.*
 - Research advisor: Fernando Ordóñez.
- 2003 **Instituto Tecnológico de Estudios Superiores de Monterrey**, México.
- M.Sc. in Quality and Productivity Systems.
- 1998 **Universidad Técnica Federico Santa María**, Valparaíso, Chile.
- Industrial Engineering degree.

PROFESSIONAL EXPERIENCE:

ACADEMIC

- 2014 - present **Universidad Técnica Federico Santa María**
- Full-time faculty member, Department of Industrial Engineering
- 1999 - 2010 **Centro Integrado de Manufactura y Automatización (CIMA-UTFSM)**
- Research Engineer
- 2003 – 2010 **Universidad Técnica Federico Santa María**
- Part-time professor, Department of Industrial Engineering

INDUSTRIAL

- 2008 - 2010 **Embonor S.A.**, Valparaiso, Chile
- Design and implementation of a monitoring and control system for production management
 - Project manager
- 2007 **Torre S.A.**, Quillota, Chile
- Design and implementation of a monitoring and control system for production management
 - Project manager
- 2005 **AFE Ltda.**, Curico, Chile.
- Operational analysis in natural juice production plant
 - Project engineer
- 2004 **Tricolor S.A.**, Viña del Mar, Chile.
- Design and implementation of a monitoring and control system for production management
 - Project manager
- 2004 **Inesa Crown S.A.**, Quilpue, Chile.
- Design and implementation of a monitoring and control system for production management
 - Project Engineer
- 2003 – 2004 **Hela S.A.**, Valparaiso, Chile.
- Design of physical distribution (Layout) for the new production plant of Hela S.A
 - Project manager
- 2002 **Hela S.A.**, Valparaiso, Chile
- Cost analysis of manufactured products
 - Project Engineer
- 2001 **Codelco Teniente; Concentradora Colon.**, Rancagua, Chile.
- Vulnerability analysis of the power supply system in the motor control center CCMP80
 - Project Engineer
- 2000 **Troncuro Muebles Metálicos Ltda., Santiago, Chile.**
- Opportunity detection to productivity improvement
 - Project Engineer.
- 2000 **Codelco Chuquicamata., Calama, Chile.**
- Self-Support Manual
 - Project Engineer

FIELDS OF INTEREST:

- Bi-level optimization
- Mathematical and combinatorial optimization
- Non linear optimization
- Stochastic Process

- Supply Chain Design
- Facility Location Modeling
- Inventory Control
- Capacity Expansion Planning
- Stackelberg game
- Fare evasion

COURSES TAUGHT:

- | | |
|---------------------|--|
| IE Undergraduate: | <ul style="list-style-type: none">• Operations Research, ILN250• Operations Management I, ICN343• Operations Management II, ICN344 |
| IE Graduate (M.Sc): | <ul style="list-style-type: none">• Facility Location, PII416• Inventory Control, PII418• Optimization II, PII417 |
| IE Professional: | <ul style="list-style-type: none">• Optimization Models, MPI401• Operations Management, MGM317 |

REFEREED PUBLICATIONS (WOS):

1. **Escalona, P.**, Brotcorne, L., Fortz, B., & Wolf, N. (2025). Spot-fare inspection in urban bus transportation systems: strategy and unpredictability under a Stackelberg game approach. *Public Transport*.
2. López-Campos, M., **Escalona, P.**, Angulo, A., Recabarren, F., & Stegmaier, R. (2024). On the Number of Customer Classes in a Single-Period Inventory System. *Mathematics*, 12(10), 1509
3. **Escalona, P.**, Brotcorne, L., Fortz, B., & Ramirez, M. (2024). Fare inspection patrolling under in-station selective inspection policy. *Annals of Operations Research*, 332(1), 191-212.
4. **Escalona, P.**, Angulo, A., Brotcorne, L., Fortz, B., & Tapia, P. (2024). Fill-rate service level constrained distribution network design. *International Transactions in Operational Research*, 31(1), 5-28.
5. Wolf, N., **Escalona, P.**, López-Campos, M., Angulo, A., & Weston, J. (2023). On Carbon Tax Effectiveness in Inducing a Clean Technology Transition: An Evaluation Based on Optimal Strategic Capacity Planning. *Sustainability*, 15(15), 11663.
6. Araya, E., Nuñez, H., Ramírez, N., Jaques, A., Simpson, R., Escobar, M., **Escalona, P.**, Vega-Castro, O., & Ramírez, C. (2022). Exploring The Potential Acceleration of Granny Smith Apple Drying By Pre-Treatment With CO₂ Laser Microperforation. *Food and Bioprocess Technology*, 1-16.
7. Brotcorne, L., **Escalona, P.**, Fortz, B., Labbé, M. (2021). Fare inspection patrols scheduling in transit systems using a stackelberg game approach. *Transportation Research Part B: Methodological* 154, 1–20.
8. **Escalona, P.**, Araya, D., Simpson, E., Ramirez, M., & Stegmaier, R. (2021). On the shortage control in a continuous review (Q, r) inventory policy using α L service-level. *RAIRO-Operations Research*, 55(5), 2785-2806.
9. Álvarez, C., Mancilla-David, F., **Escalona, P.**, & Angulo, A. (2019). A Bienstock–Zuckerberg-Based Algorithm for Solving a Network-Flow Formulation of the Convex Hull Pricing Problem. *IEEE Transactions on Power Systems*, 35(3), 2108-2119.
10. **Escalona, P.**, Angulo, A., Weston, J., Stegmaier, R., Kauak, I. (2019). On the effect of two popular service-level measures on the design of a critical level policy for fast-moving items. *Computers & Operations Research* 107, 107-126.
11. **Escalona, P.**, Marianov, V., Ordóñez, F., & Stegmaier, R. (2018). On the effect of inventory policies on distribution network design with several demand clases. *Transportation Research Part E: Logistics and Transportation Review*, 111, 229-240.

12. **Escalona, P.**, Ordóñez, F., & Kauak, I. (2017). Critical level rationing in inventory systems with continuously distributed demand. *OR Spectrum*, 39(1), 273-301.
13. **Escalona, P.**, Ordóñez, F., & Iturrieta, E. (2017). Convex backorders of a rationing inventory policy with two different demand classes. *RAIRO-Operations Research*, 51(2), 359-373.
14. **Escalona, P.**, Ordóñez, F., & Marianov, V. (2015). Joint location-inventory problem with differentiated service levels using critical level policy. *Transportation Research Part E: Logistics and Transportation Review*, 83, 141-157.

PROCEEDINGS:

1. Wolf, N., **Escalona, P.**, Angulo, A., & Weston, J. (2022). On Carbon Taxes Effectiveness to Induce a Clean Technology Transition: An Evaluation Framework Based on Optimal Strategic Capacity Planning. arXiv preprint arXiv:2202.11507.
2. Contreras, C., López-Campos, M., **Escalona, P.**, Stegmaier, R., & Grubessich, T. (2018). Machine learning modeling for massive industrial data: Railroad peak kips prediction. In *Safety and Reliability—Safe Societies in a Changing World* (pp. 1139-1142). CRC Press.
3. Iriarte G., **Escalona P.**, Angulo A. and Stegmaier R. (2017). A Single-source Weber Problem with Continuous Piecewise Fixed Cost. In *Proceedings of the 6th International Conference on Operations Research and Enterprise Systems – Volume 1: ICORES*, ISBN 978-989-758-218-9, pages 337-344.
4. Weston J., **Escalona P.**, Angulo A. and Stegmaier R. (2017). Strategic Capacity Expansion of a Multi-item Process with Technology Mixture under Demand Uncertainty: An Aggregate Robust MILP Approach. In *Proceedings of the 6th International Conference on Operations Research and Enterprise Systems – Volume 1: ICORES*, ISBN 978-989-758-218-9, pages 181-191.
5. **Escalona, P.**, Oyarzo, J., Pérez, J. and Pérez, L., 2016. Políticas de racionamiento a través de listas de prioridad. In *XIV Simposio Argentino de Investigación Operativa (SIO 2016)-JAIIO 45* (Tres de Febrero, 2016).
6. **Escalona, P.**, & Iturrieta, E. (2015). Aproximación convexa para los backorders de una política de nivel crítico con demanda continua. In *XIII Simposio Argentino de Investigación Operativa (SIO)-JAIIO 44* (Rosario, 2015).
7. **Escalona, P.**, & Ordoñez, F. Política de racionamiento bajo restricciones de nivel de servicio y demanda estocástica continua. In *XI Simposio Argentino de Investigación Operativa (SII)-JAIIO 42* (Córdoba, 2013).
8. **Escalona, P.**, & Medina, D. Modelo continuo de localización y diseño para un centro de distribución en ambiente competitivo. In *X Simposio Argentino de Investigación Operativa (SII)-JAIIO 41* (Buenos Aires, 2012).

9. **Escalona, P.**, & Ramírez, D. Expansión de capacidad para un proceso, múltiples ítems y mezcla de tecnologías. In X Simposio Argentino de Investigación Operativa (SII)-JAIIO 41 (Buenos Aires, 2012).

CONFERENCES AND MEETINGS:

1. Wolf, N., **Escalona, P.**, & Brotcorne, L. (2025). Spot fare inspection in urban buses transportation system: strategy and unpredictability under Stackelberg game approach. Triennial Symposium on Transportation Analysis, TRISTAN 2025.
2. Simpson E, **Escalona P**, Brotcorne P, Fortz P. (2023). Spot fare inspections under non-adaptive opportunistic passengers and mass inspection policy. The 23rd Conference of the International Federation of Operational Research Societies IFORS2023.
3. Ramírez M, Simpson E, **Escalona P.** (2022). Enfoque temporal para controlar la escasez en sistemas de inventario. XXI Latin-Iberoamerican Conference on Operations Research CLAIO 2022.
4. Simpson E, Escalona P, Wolf N, Brotcorne L. (2022). Spot fare inspections under non-adaptive opportunistic passengers and mass inspection policy using a Stackelberg game approach. XXI Latin-Iberoamerican Conference on Operations Research CLAIO 2022.
5. Ramírez M, **Escalona P**, Brotcorne P. (2022). Fare inspection patrolling under in-station selective inspection policy using a Stackelberg approach. XXI Latin-Iberoamerican Conference on Operations Research CLAIO 2022.
6. Tapia P, **Escalona P**, Angulo A. (2022). The Joint Location-Inventory Problem under continuous review (Q, r) policy with Fill-rate service level constraint. XXI Latin-Iberoamerican Conference on Operations Research CLAIO 2022.
7. Wolf N, **Escalona P**, Angulo A, Weston J. (2022). On Carbon Taxes Effectiveness to Induce a Technological Transition: A Strategic Capacity Planning Based Analysis. Applied Combinatorial Optimization 2021-2022 ALIO/EURO International Conference.
8. Araya D., **Escalona P.**, Weston J. (2018). Continuous Location Problem for Multiple Mobile Resources in the Wildfire Suppression Context. XIX Latin-Iberoamerican Conference on Operations Research CLAIO 2018.
9. **Escalona P.**, Angulo A. (2018). Optimal continuous review (Q,r,C) policy under service levels constraints. XIX Latin-Iberoamerican Conference on Operations Research CLAIO 2018.
10. Recabarren F., **Escalona P.**, Angulo A., Stegmaier R., Weston J. (2018). On the effect of customer pooling in control inventory systems.. XIX Latin-Iberoamerican Conference on Operations Research CLAIO 2018.
11. **Escalona P.** (2017). Single Period Inventory Problem under Differentiated Service Levels using a Responsive Allocation Policy. INFORMS Annual Meeting 2017.
12. Alfaro G., **Escalona P.**, López-Campos M. (2017) Methodology for the use of coverage models for the allocation of mobile resources for forest fires extinguishing: applied case in Valparaíso, Chile. 3rd International Conference on Dynamics of Disasters.

13. Araneda L., **Escalona P.**, Stegmaier R. (2017). Programación óptima de minuta para un servicio de alimentación masivo. XII Chilean conference on Operations Research, OPTIMA 2017.
14. Alvarez C., Angulo A., **Escalona P.** (2017). A BZ Algorithm for Solving a Network Flow Formulation of the Convex Hull Pricing Problem. XII Chilean conference on Operations Research, OPTIMA 2017.
15. Weston J., **Escalona P.**, Angulo A., Stegmaier R. (2016). Capacity expansion of a multi-item process with technology mixture under uncertainty: A robust MILP approach. XVIII Latin-Iberian-American Conference on Operations Research CLAIO 2016.
16. Barraza P., **Escalona P.** (2016). Nurse Rostering Problem: Un caso aplicado a un hospital en Nueva Zelanda. XVIII Latin-Iberian-American Conference on Operations Research CLAIO 2016.
17. **Escalona P.**, Reyes C., Marianov V., Ordóñez F., Stegmaier R. (2016). On the Effect of Inventory Policies on Distribution Network Design with two Demand Classes. XVIII Latin-Iberian-American Conference on Operations Research CLAIO 2016.
18. **Escalona P.**, Angulo A., Stegmaier R., Weston J. (2014). Expansión de capacidad de un proceso, multi artículos y mezcla de tecnologías bajo condiciones de incertidumbre. XVII Latin-Iberian-American Conference on Operations Research CLAIO 2014.
19. **Escalona P.**, Angulo A., Saavedra B. (2014). Racionamiento de inventario y politica de asignacion para requerimientos de nivel de servicio multicliente. XVII Latin-Iberian-American Conference on Operations Research CLAIO 2014.
20. **Escalona P.**, Reyes C., Stegmaier R. (2014). Integrating inventory and facility location decisions in a network with different demand classes. XVII Latin-Iberian-American Conference on Operations Research CLAIO 2014.
21. **Escalona P.**, Angulo A., Stegmaier R., Kauak I. (2014). Politica de invetarios con racionamiento de nivel critico, demanda estocastica continual y nivel de servicio Fill-rate. XVII Latin-Iberian-American Conference on Operations Research CLAIO 2014.
22. **Escalona P.**, Ordóñez F. (2014). Critical Level Rationing In Inventory Systems With Continuous Demand. INFORMS Annual Meeting 2014
23. **Escalona P.**, Ordóñez F. (2013). Rationing policy under service level constraints and continuous stochastic demand. INFORMS Annual Meeting 2013.

FOUNDED RESEARCH ACTIVITIES

EXTERNALLY FUNDED PROJECTS

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|-------------|--|
| 2025 - 2028 | FONDECYT 1250126 <ul style="list-style-type: none"> • Strategy and unpredictability to deter crime and improve security perception in urban areas using Stackelberg games approach. • Responsible researcher. |
| 2020 - 2023 | FONDECYT 11200287 <ul style="list-style-type: none"> • Patrolling strategies to avoid fare evasion in public transportation systems: a Stackelberg game approach. • Responsible researcher. |
| 2005 - 2006 | Corfo FDI <ul style="list-style-type: none"> • Monitoring system for decision making in discrete production plants. • Co-researcher |
| 1999 - 2001 | FONDEF D99I1091 <ul style="list-style-type: none"> • Introduction of Advanced Manufacturing Technologies (AMT) in the National Metalworking Industry • Research Engineer. • Stegmaier R., Escalona P., Weinstein A., Hernandez J., Rodriguez D., Gonzalez E. (2006). System and device for remote monitoring of one or more lines of discrete manufacturing processes CL Patent N°45924. Santiago, Chile: INAPI Chile. |

INTERNALLY FUNDED PROJECTS

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|-------------|---|
| 2020 - 2021 | UTFSM-DGHE PI_LIR_2020_12 <ul style="list-style-type: none"> • Application of Stackelberg games to avoid fare evasion in public transportation systems. • Responsible researcher. |
| 2016-2017 | UTFSM-DGIP N°116282 <ul style="list-style-type: none"> • Location of mobile resources for forest emergencies considering the continuous propagation of fires under uncertain conditions. • Responsible researcher. |
| 2015 | UTFSM-DGIP N°281476 <ul style="list-style-type: none"> • Integration of inventory control decisions with facility location for several demand classes. • Responsible researcher. |

M.Sc. THESIS SUPERVISION:

- Javiera Carrasco (August 2025)
Title: Managing street vending: a Stackelberg-Nash game approach.
- Jorge Caceres (August 2024)
Title: The joint location inventory problem with shortage cost.
- Enrique Simpson (September 2023)
Title: Spot fare inspections under non-adaptive opportunistic passengers and mass inspection policy.
- Mario Ramirez (March 2023)
Title: Fare inspection patrolling under in-station selective inspection policy.
- Paulina Tapia (December 2022)
Title: Decomposition methods for mixed integer nonlinear problems (MINLP): Fill-rate service level constrained Distribution Network design.
- Nathalia Wolf (August 2021)
Title: Strategic Capacity Planning under Carbon Taxes.
- Diego Araya (January 2021)
Title: Pure and Mixed Service Level Policies in Inventory Systems.
- Kevin Urbina (November 2020)
Title: Shortage Control in Inventory Systems.
- Gabriela Iriarte (January 2017)
Title: A Single-source Weber Problem with Continuous Piecewise Fixed Cost.
- Francisca Recabarren (December 2018)
Title: Effect of customer pooling in control inventory systems: a Sample Average Approach.

PROFESSIONAL AFFILIATIONS:

- ICHIO (Chilean Institut of Operational Research)
- INFORMS (Institut for Operations Research and Management Science)
- BOS (Bilevel Optimization Society)