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**
- Ful-time faculty member, Department of Industrial Engineering

1999 - 2010 **Centro Integrado de Manufactura y Automatizacion (CIMA-UTFSM)**
- Research Enginneer

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 **Troncura 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:
- Operations Research, ILN250
- Operations Management I, ICN343
- Operations Management II, ICN344
- Industrial Process Laboratory, ILN251

IE Graduate (M.Sc):
- Facility Location, PII416
- Inventory Control, PII418
- Optimization II, PII417

IE Professional:
- Optimization Models, MPI401
- Operations Management, MGM317

REFEREED PUBLICATIONS (WOS):

1. 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

2. **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.

3. **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.

4. 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.

5. 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.

6. 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.

7. **Escalona, P**., Araya, D., Simpson, E., Ramirez, M., & Stegmaier, R. (2021). On the shortage control in a continuous review (Q, r) inventory policy using αL service-level. RAIRO-Operations Research, 55(5), 2785-2806.

8. 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.

9. **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.

10. **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.

11. **Escalona, P**., Ordóñez, F., & Kauak, I. (2017). Critical level rationing in inventory systems with continuously distributed demand. OR Spectrum, 39(1), 273-301.

12. **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.

13. **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 (Córdova, 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. 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.

2. 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.

3. 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.

4. Ramirez 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.

5. 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.

6. 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.

7. 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.

8. **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.

9. 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.

10. **Escalona P**. (2017). Single Period Inventory Problem under Differentiated Service Levels using a Responsive Allocation Policy. INFORMS Annual Meeting 2017.

11. 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.

12. 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.

13. 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.

14. 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.

15. 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.

16. **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.

17. **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.

18. **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.

19. **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.

20. **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.

21. **Escalona P**., Ordóñez F. (2014). Critical Level Rationing In Inventory Systems With Continuous Demand. INFORMS Annual Meeting 2014

22. **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

2020 - 2023 **FONDECYT 11200287**
- Patrolling strategies to avoid fare evasion in public transportation systems: a Stackelberg game approach.
- Responsible researcher.

2005 - 2006 **Corfo FDI**
- Monitoring system for decision making in discrete production plants.
- Co-resercher

1999 - 2001 **FONDEF D99I1091**
- Introduction of Advanced Manufacturing Technologies (AMT) in the National Metalworking Industry
- Research Enginneer.
- 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 Nº45924. Santiago, Chile: INAPI Chile.

INTERNALLY FUNDED PROJECTS

2020 - 2021 **UTFSM-DGIIE PI_LIR_2020_12**
- Application of Stackelberg games to avoid fare evasion in public transportation systems.
- Responsible researcher.

2016-2017 **UTFSM-DGIP Nº116282**
- Location of mobile resources for forest emergencies considering the continuous propagation of fires under uncertain conditions.
- Responsible researcher.

2015 **UTFSM-DGIP Nº281476**
- Integration of inventory control decisions with facility location for several demand classes.
- Responsible researcher.

M.SC. THESIS SUPERVISION:

- 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)