Diego Ponce

Personal Data

PLACE AND DATE OF BIRTH:	Antas (Almería), Spain — 03 May 1985
ADRESS:	Despacho H1.61
	Escuela Técnica Superior de Ingeniería Informática
	Universidad de Sevilla
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Work Experience

Feb 2021 - Feb 2024	**_Postdoctoral Fellow_**
	Universidad de Sevilla
	Departamento de Estadística e Investigación Operativa
	FQM331 (Junta de Andalucía)
	European Social Fund
	Supervisor: Justo Puerto
Sep 2020 - Feb 2021	**_Full-time Lecturer_**
	Universidad de Zaragoza
	Departamento de Métodos Estadísticos
Mar 2020 - Jul 2020	**_Full-time Lecturer_**
	Universidad de Granada
	Departamento de Estadística e Investigación Operativa
Feb 2020 - Mar 2020	**_Full-time Lecturer_**
	Universidad de Sevilla
	Departamento de Estadística e Investigación Operativa
Sep 2019 - Feb 2020	**_Full-time Lecturer_**
	Universidad de Sevilla
	Departamento de Economía Aplicada I
Mar 2018 - Sep 2019	**_Postdoctoral Fellow_**
	Concordia University,
	Department of Mechanical, Industrial and Aerospace Engineering
	Horizon Postdoctoral Fellowship
	Supervisors: Ivan Contreras and Gilbert Laporte
Feb 2017- Feb 2018	**_Postdoctoral Fellow_**
	Universidad de Sevilla
	Departamento de Estadística e Investigación Operativa
	FQM-5849 (Junta de Andalucía)
	Supervisor: Justo Puerto
Feb 2016- Jan 2017	**_Researcher_**
	Université libre de Bruxelles
	Département d'Informatique
	COMEX
	Supervisor: Martine Labbé
Feb 2012- Feb 2016	**_Predoctoral Fellow_**
	Universidad de Sevilla
	Departamento de Estadística e Investigación Operativa
	FQM-5849 (Junta de Andalucía)
	Supervisor: Justo Puerto
2009 - 2011	**_High School Teacher_**

Habilitations

Given by Agencia Nacional de Evaluación de la Calidad y Acreditación (ANECA):

PROFESOR AYUDANTE DOCTOR. November 2019.
PROFESOR CONTRATADO DOCTOR. November 2020.
PROFESOR DE UNIVERSIDAD PRIVADA. November 2020.

Education

2016	**PhD degree in Mathematics** (Universidad de Sevilla)
	PhD degree in Sciences (Université libre de Bruxelles)
	Title: The DOMP revisited: new formulations, properties and algorithms
	Supervisors: Justo Puerto and Martine Labbé
	Cum Laude
2013	**Master in Advanced Mathematics**
	Thesis: Polyhedral Analysis of the Discrete Ordered Median Problem
	Advisor: Justo Puerto
	Thesis qualification: 10/10
	8.82/10
	Universidad de Sevilla
2010-11	**Extracurricular courses at Faculty of Mathematics**
	Discrete Optimization and Graphs Theory
	Linear Optimization
	Nonlinear Optimization
	Universidad de Murcia
2009	**2nd cycle-Industrial Management Engineering**
	with a concentration in Production Management
	7.97/10
	Universidad Politécnica de Cartagena
2009	**Teaching Certificate**
	Universidad de Murcia
2006	**3 years-Bachelor of Science in Industrial Chemical Engineering**
	with a concentration in Chemical Processes
	7.57/10
	Universidad Politécnica de Cartagena

Fields of interest

Combinatorial Optimization, Location Theory, Networks, Logistics and Transportation.

Programming skills

FICO Xpress
SCIP
CPLEX

Language skills

Spanish: mother tongue.
English: medium-high proficiency (B2). 2014.
Instituto de Idiomas de la Universidad de Sevilla.
French: elementary proficiency (A2). 2017.
Enseignement de promotion et de formation continue de l'Université libre de Bruxelles et de la Chambre de Commerce et d'Industrie de Bruxelles.

Publications

[1] V. Blanco, G. González, Y. Hinojosa, D. Ponce, M. A. Pozo, and J. Puerto. **Network Flow based approaches for the Pipelines Routing Problem in Naval Design**. *Omega* (2022) 111: 102659.

https://doi.org/10.1016/j.omega.2022.102659

[2] S. Benati, D. Ponce, J. Puerto, and A. M. Rodríguez-Chía. **A branch-and-price procedure for clustering data that are graph connected**. *European Journal of Operational Research* (2022) 297: 817–830.

https://doi.org/10.1016/j.ejor.2021.05.043

[3] V. Blanco, A. Japón, D. Ponce, and J. Puerto. **On the multisource hyperplanes location problem to fitting set of points**. *Computers and Operations Research* (2021) 128: 105124.

https://doi.org/10.1016/j.cor.2020.105124

[4] A. Marín, D. Ponce, and J. Puerto. **A fresh view on the Discrete Ordered Median Problem based on partial monotonicity**. *European Journal of Operational Research* (2020) 286: 839–848.

https://doi.org/10.1016/j.ejor.2020.04.023

[5] D. Ponce, I. Contreras, and G. Laporte. **E-commerce shipping through a third-party supply chain**. *Transportation Research Part E: Logistics and Transportation Review* (2020) 140: 101970.

https://doi.org/10.1016/j.tre.2020.101970

[6] M. Leal, D. Ponce, and J. Puerto. **Portfolio problems with two levels decision-makers: Optimal portfolio selection with Pricing decisions on transaction costs**. *European Journal of Operational Research* (2020) 284: 712–727.

https://doi.org/10.1016/j.ejor.2019.12.039

[7] S. Deleplanque, M. Labbé, D. Ponce, and J. Puerto. **A Branch-Price-and-Cut Procedure for the Discrete Ordered Median Problem**. *INFORMS Journal on Computing* (2020) 32: 582–599.

https://doi.org/10.1287/ijoc.2019.0915

[8] D. Ponce, J. Puerto, F. Ricca, and A. Scozzari. **Mathematical programming formulations for the efficient solution of the k-sum approval voting problem**. *Computers and Operations Research* (2018) 98: 127–136.

https://doi.org/10.1016/j.cor.2018.05.014

[9] M. Labbé, D. Ponce, and J. Puerto. **A comparative study of formulations and solution methods for the discrete ordered p-median problem**. *Computers & Operations Research* (2017) 78: 230–242.

https://doi.org/10.1016/j.cor.2016.06.004

[10] V. Blanco, J. Puerto, and D. Ponce. **Continuous location under the effect of 'refraction'**. *Mathematical Programming* (2017) 161: 33–72.

https://doi.org/10.1007/s10107-016-1002-x

[11] V. Blanco, R. Gázquez, D. Ponce, and J. Puerto. **A Branch-and-Price approach for the Continuous Multifacility Monotone Ordered Median Problem**. *Submitted.*

https://arxiv.org/abs/2108.00407

[12] L.I. Martínez-Merino, D. Ponce, and J. Puerto. **Constraint relaxation for the Discrete Ordered Median Problem**. *Working paper.*

[13] V. Blanco, G. González, Y. Hinojosa, D. Ponce, M. A. Pozo, and J. Puerto. **Network Flow based approaches for Cable Trays Routing Problem in Naval Design**. *Working paper.*

Book chapters

[1] Y. Hinojosa and D. Ponce. **A mathematical optimization and Machine Learning approach for pipeline routing**. In J. Guadix Martín, M. Lilic, M. Rosales Martínez (Eds.), *AI Knowledge Transfer from the University to Society: Applications in High-Impact Sectors* (pp. 65–69) (2022). ISBN: 978-1-032-22632-3. Taylor & Francis.

www.routledge.com/AI-Knowledge-Transfer-from-the-University-to-Society-Applications-in-High-Impact/Martin-Lilic-Martinez/p/book/9781032226323

Proceedings Editor

[1] M. Albareda-Sambola, M. Baldomero-Naranjo, L. I. Martínez-Merino, D. Ponce, M. A. Pozo, J. Puerto, and V. Rebillas-Loredo (Eds.) *Proceedings of X International Workshop on Locational Analysis and Related Problems* (2020). ISBN: 78-84-09-17797-4.

http://redloca.ulpgc.es/images/workshop/2020/proceedings2020.compressed.pdf

Conferences and scientific meetings

1. **Un sistema automatizado de rutado de canalizaciones basado en aprendizaje automático y programación matemática** (poster). *Acto de clausura del Proyecto Singular CEI Andalucía Tech.*
   Málaga, December 9, 2021. Coauthors: V. Blanco, G. González, Y. Hinojosa, M. A. Pozo y J. Puerto.

2. **Relajación de restricciones en Optimización Discreta Mixta**. *XIV Seminario de Optimización de Recursos y Teoría de Juegos.*
   Murcia, October 29, 2021.

3. **From the Discrete Ordered Median Problem to other combinatorial optimization problems**. *Advances on logistics and transportation problems on complex networks: Evaluation and conclusions.*
   Fuengirola, June 24, 2021.

4. **A Branch-and-price procedure for continuous multifacility location problems**. *Reunión de seguimiento del proyecto BBVA y MTM 2016.*
   Sevilla, March 25. 2021. Coauthors: V. Blanco, R. Gázquez y. Puerto.

5. **Clustering data that are graph connected**. *IUMA Day on Mathematical Optimization for Data Science.*
   Zaragoza, March 19, 2021. Coauthors: S. Benati, J. Puerto y A. M. Rodríguez-Chía.

6. **Clustering data that are graph connected**. *Seminario virtual IMUS: Ciclo Aplicaciones de la Optimización en el Instituto Andaluz de Matemáticas.*
   Sevilla, January 22, 2021. Coauthors: S. Benati, J. Puerto y A. M. Rodríguez-Chía.

7. **Dynamic shipping in hierarchical freight transportation network**. *X International Workshop on Locational Analysis and Related Problems.*
   Sevilla, January 23-25, 2020. Coauthors: I. Contreras y G. Laporte.

8. **Dynamic shipping in hierarchical freight transportation network**. *JOPT 2019.*
   Montreal, May 13-15, 2019. Coauthors: I. Contreras y G. Laporte.

9. **Quasimonotone Discrete Ordered Median Problem**. *EWGLA 2018.*
   Edinburgh, May 23-25, 2018. Coauthors: A. Marín and J. Puerto.

10. **Mathematical programming formulations for the effcient solution of the k-sum approval voting problem**. *JOPT 2018.*
    Montreal, May 7-9, 2018. Coauthors: J. Puerto, F. Ricca and A. Scozzari.

11. **Branch&Price approaches for the Discrete Ordered Median Problem**. *SYSORM 2017.*
    Granada, November 13-15, 2017. Coauthors: S. Deleplanque, M. Labbé and J. Puerto.

12. **Approval Voting Problem under the k-centrum criterion**. *VIII International Workshop on Locational Analysis and Related Problems.*
    Segovia, September 27-29, 2017. Coauthors: J. Puerto, F. Ricca and A. Scozzari.

13. **Formulations for the Discrete Ordered Median Problem with novel features**. *IFORS 2017.*
    Quebec City, July 16-21, 2017. Coauthors: A. Marín and J. Puerto.

14. **Branch&Price approaches for the Monotone Ordered Median Problem**. *ISOLDE 2017.*
    Toronto and Muskoka, July 9-14, 2017. Coauthors: M. Labbé and J. Puerto.

15. **A GRASP heuristic for the Discrete Ordered Median Problem: how to exploit it into an exact method**. *ORBEL31.*
    Brussels, February 2-3, 2017. Coauthors: S. Deleplanque, M. Labbé and J. Puerto.

16. **The DOMP revisited: new formulations, properties and algorithms**. *GOM seminar (Université libre de Bruxelles).*
    Brussels, October 13, 2016.

17. **Set formulations for the Monotone Ordered Median Problem**. *XXIII EURO Working Group on Locational Analysis. VII International Workshop on Locational Analysis and Related Problems.*
    Málaga, September 14-16, 2016 Coauthors: M. Labbé and J. Puerto.

18. **Convex ordered median problem**. *VI International Workshop on Locational Analysis and Related Problems.*
    Barcelona, November 25-27, 2015 Coauthors: M. Labbé and J. Puerto.

19. **Nuevos enfoques del Problema Discreto de la Mediana Ordenada**. *RSME 2015.*
    Granada, February 2-6, 2015. Coauthors: M. Labbé and J. Puerto.

20. **Introducción al Software libre de Optimización SCIP. Una aplicación de SCIP: resolución del DOMP mediante branch-and-price**. *Reunión del Proyecto de Investigación FQM-5849.*
    Sanlúcar de Barrameda, November 28-30, 2014.

21. **El Problema Discreto de la Mediana Ordenada: definición y nuevos enfoques**. *Seminario PHD (IMUS).*
    Sevilla, October 14, 2014. Coauthors: M. Labbé and J. Puerto.

22. **New Approaches of the Discrete Ordered Median Problem**. *ISOLDE 2014*.
    Naples and Capri, July 16-20, 2014. Coauthors: M. Labbé and J. Puerto.

23. **Nuevos enfoques del Problema Discreto de la Mediana Ordenada**. *Reunión del Proyecto de Investigación FQM-5849*.
    Jerez de la Frontera, March 20, 2014. Coauthors: M. Labbé and J. Puerto.

24. **Polyhedral Analysis of the Discrete Ordered Median Problem**. *SEIO 2013*.
    Castellón, September 11-13, 2013. Coauthors: M. Labbé and J. Puerto.

25. **Polyhedral Analysis of the Discrete Ordered Median Problem**. *ELAVIO 2013*.
    Valencia, September 9-12, 2013. Coauthors: M. Labbé and J. Puerto.

Workshops

1. **Graduate Summer School on Mixed Integer Nonlinear Programming:"Theory, algorithms and applications"**. Seville, June 20-July 1, 2016.

2. **II SEVILLA WORKSHOP Mixed Integer NonLinear Programming**. Seville, March 30-April 1, 2015.

3. **SCIP Workshop 2014**. Berlin, September 30- October 2, 2014.

4. **2014 School on Column Generation**. Paris. March 10-14,2014.

5. **Winter School on Network Optimization**. Estoril, January 14-18, 2013.

6. **Triangulations and Extremal Graph Theory**. Seville, March 5 al 17, 2012.

Organized workshops

X International Workshop on Locational Analysis and Related Problems.
Seville, January 23-24, 2020.
`http://redloca.ulpgc.es/redloca20.html`

II Pre-doc Course on Operations Research 2015.
Seville, June 22-23 and December 9, 2015.
`http://www.imus.us.es/PDCOR15/`

II Pre-doc Symposium on Mathematical Optimization 2013.
Seville, December 12-13, 2013.
`http://www.imus.us.es/PDSMOII13/`

Research Projects Fellow

- **Optimization on data science and network design problems: large scale network models meet optimization and data science tools.**

  PID2020-114594GB-C21. Dates: 01/09/2021 - 31/08/2025.

  `https://investigacion.us.es/sisius/sis_proyecto.php?idproy=33871`

- **Analysis of Complex Networks under Modern Optimization and Statistical lens (COXMOS).**

  B-FQM-322-UGR20. Dates: 01/07/2021 - 30/06/2023.

- **Retos de la optimización combinatoria en los nuevos modelos de redes complejas y ciencia de datos.**

  P18-FR-1422-USE. Dates: 01/01/2020 - 31/12/2022.

  `https://investigacion.us.es/sisius/sis_proyecto.php?idproy=30878`

- **Complex networks meet data science (NetmeetData).**
  COMPLEX NETWORKS. Dates: 01/05/2020 - 30/10/2022.
  `https://investigacion.us.es/sisius/sis_proyecto.php?idproy=32033`

- **Nuevos resultados sobre los problemas de diseño y optimización en redes complejas: Aplicaciones al diseño de ciudades inteligentes.**
  US-1256951. Dates: 01/02/2020-31/04/2022.
  `https://investigacion.us.es/sisius/sis_proyecto.php?idproy=30367`

- **Nuevos Desafíos Matemáticos en Problemas Logísticos y de Transporte Integrado sobre Redes Complejas: Diseño y Optimización.**
  MTM2016-74983-C2-1-R. Dates: 30/12/2016 - 29/06/2021.
  `https://investigacion.us.es/sisius/sis_proyecto.php?idproy=27622`

- **Desafíos Matemáticos en el Diseño y Optimización de Redes Complejas: Aplicaciones.**
  MTM2013-46962-C2-1-P. Dates: de 01/01/2014-31/12/2017.
  `https://investigacion.us.es/sisius/sis_proyecto.php?idproy=24312`

- **Nuevos Desafíos de la Matemática Combinatoria: Enfoques no Estándares en Optimización Discreta y Álgebra Computacional. Aplicaciones.**
  P10-FQM-5849. Dates: 15/03/2011-30/04/2016.
  `https://investigacion.us.es/sisius/sis_proyecto.php?idproy=18722`

Technological Transfer Projects Fellow

- **Un sistema automatizado de rutado de canalizaciones basado en aprendizaje automático y programación matemática.**
  CEI-3. Dates: 01/03/2020 - 30/09/2021.
  `https://investigacion.us.es/sisius/sis_proyecto.php?idproy=32038`

Research stays

- **Visiting fellow, IMUS, Universidad de Sevilla**. January 2021. Funded by Project MTM2016-74983.

- **Postdoctoral fellow, Department of Mechanical, Industrial and Aerospace Engineering, Concordia University**. From March 2018 to September 2019.

- **Research fellow, Department of Computer Science, Université libre de Bruxelles**. From February 2016 to January 2017.

- **Visiting fellow, Department of Computer Science, Université libre de Bruxelles**. Autumn 2015. Funded by V Plan Propio Universidad de Sevilla 2015 (I.6A).

- **Visiting fellow, Department of Computer Science, Université libre de Bruxelles**. Autumn 2013. Funded by Project FQM-5849.

Teaching experience

Undergraduate courses

2013-2014 **Statistics in Biology**. 7h. *Universidad de Sevilla*
2013-2014 **Statistics in Computer Engineering**. 10h. *Universidad de Sevilla*
2013-2014 **Statistics in Health Engineering**. 32.5h. *Universidad de Sevilla*
2014-2015 **Statistics in Law and Public Administration**. 30h. *Universidad de Sevilla*
2014-2015 **Statistics in Health Engineering**. 32.5h. *Universidad de Sevilla*
2015-2016 **Operations Research's Models in Mathematics**. 12h. *Universidad de Sevilla*
2016-2017 **Statistics in Computer Engineering**. 6h. *Universidad de Sevilla*
2017-2018 **Operations Research's Models in Mathematics**. 30h. *Universidad de Sevilla*
2017-2018 **Statistics in Biology**. 30h. *Universidad de Sevilla*
2019-2020 **Mathematics in Business Administration**. 120h. *Universidad de Sevilla*
2019-2020 **Statistics in Law and Public Administration**. 16h. *Universidad de Sevilla*
2019-2020 **Quantitative Data Analysis in Criminology**. 16h. *Universidad de Sevilla*
2019-2020 **Probability in Mathematics**. 95h. *Universidad de Granada*
2020-2021 **Statistics in Labour Relations and HR**. 240h. *Universidad de Zaragoza*
2021-2022 **Statistics in Health Engineering**. 30h. *Universidad de Sevilla*
2021-2022 **Statistics in Law and Public Administration**. 30h. *Universidad de Sevilla*

PhD courses

2017-2018 **Modelling and programming with SCIP**. 10 h. *Universidad de Sevilla*
https://www.imus.us.es/es/actividad/2078

Other activities

- **Fellow of IMUS, Instituto de Matemáticas Universidad de Sevilla Antonio de Castro Brzezicki** since July 2012.

- **Fellow of EURO Working Group on Locational Analysis** since June 2014.

- **Fellow of SEIO, Sociedad de Estadística e Investigación Operativa** since June 2014.

- **Collaborator at Graphes et Optimisation Mathématique group, at the Department of Computer Science the Université libre de Bruxelles** since February 2016 to December 2019.

- **Fellow of INOCS - Integrated Optimization with Complex Structure (INRIA France)** since February 2016 to January 2017.

- **Fellow of CIRRELT, Centre interuniversitaire de recherche sur les réseaux d'enterprise, la logistique et le transport** since March 2018 to July 2020.

Current situation

Postdoctoral fellow in the Department of Statistics and Operations Research, Faculty of Mathematics, Universidad de Sevilla until February 11 2024.

Regards,

Diego Ponce

Sevilla, April 2022.