



JUAN C. DUQUE

Research Scientist | **CARBON SOLUTIONS LLC**

PROFILE

Dr. Juan C. Duque is Research Scientist at CARBON SOLUTIONS LLC, a startup focusing on low-carbon energy Research & Development and Software & Services, including CO₂ capture and storage (CCS), energy storage, geothermal energy, and wind energy. Duque is a world leading expert in the field of region design and has a wide experience in the formulation of new methods for spatiotemporal analysis. He is a member of the editorial board of *International Regional Science Review*, *Computers Environment and Urban Systems*, *Journal of Regional Research*, and *Computational Urban Science*. Juan has been a consultant for institutions such as: The World Bank, UN-Habitat, Inter-American Development Bank, Andean Development Corporation, San Diego East Economic Development Council, ESRI, European Commission, Barcelona City Council, among others. He is Co-I in one of the biggest research project on urban studies, the PEAK-Urban project, supported by UKIR's Global Challenge Research Fund (Grant Ref.: ES/P011055/1)

CONTACT

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Website:

www.carbonsolutionsllc.com

Twitter (529 followers):

[@juancaduque](https://twitter.com/juancaduque)

EDUCATION & TRAINING

Ph.D. | Management | **University of Barcelona**

2000–2004 | Best dissertation award 2003–2004

M.Sc. | Management and Economics | **Pompeu Fabra University**

1999–2000

B.A. | Business Administration | **National University of Colombia**

1993–1998

PROFESSIONAL EXPERIENCE

Research Scientist | **CARBON SOLUTIONS LLC** | 2023–Present

Formulation and implementation of optimization models within the area of carbon capture, transport and storage | Contribute to the production of scientific articles in the area of CO₂ capture and storage.

Full Prof. School of Applied Sciences & Engeneereeng | **Eafit University** | 2022–2023

Full Professor in the academic area of Territories and Cities | Funder/director RiSE group

Full Professor School of Sciences | **Eafit University** | 2018–2022

Full Professor at the Department of Mathematical Sciences | Funder/director RiSE group

Full Professor School of Economics and Finances | **Eafit University** | 2007–2018

Full Professor at the Department of Economics | Funder/director RiSE group | Executive Director of the PhD in Economics | Interim Chair of the Department of Economics | Academic Director of the Master in Applied Economics | Academic Director of the Master in Economics

Postdoctoral researcher | **San Diego State University** | 2005–2007

Region design | Industry clusters identification | Exploratory Space Time Data Analysis

Director of Production Planning | **Super de Alimentos S.A.** | 1997–1999

Production Planning | implementation of the theory of constraints

AWARDS

- Research award | **Eafit University** | **2013**
- Best dissertation award 2003–2004 | **2005**

SOFTWARE DEVELOPMENT

- **Newton** | Data driven urban growth modeling | **2019**
- **ClusterPy** | Degion design | **2017**
- **Pascal** | Model based urban growth modeling | **2011**
- **PLS-Py SAIA** | System for dropout intentions analysis | **2007**
- **InclusIO** | Industry Clusters based on Input Output tables | **2006**

JURY MEMBER AT INTERNATIONAL AWARDS

- **2020**: Jury Member of the Dubai International Best Practices Award for Sustainable Development. Dubai Municipality and UN-Habitat. [Watch](#).

PUBLICATIONS

1. **Duque, J. C. (2023).** The paradox: economic growth that endangers the future of research in Colombia. *International Journal of Urban and Regional Research*. doi.org/10.1111/1468-2427.13147.
2. Giraldo-Quintero, A., Lalinde-Pulido, J. G., **Duque, J. C.**, Sierra-Sosa, D. (2022). Using quantum computing to solve the maximal covering location problem. *Computational Urban Science*, 2(1), 43. doi.org/10.1007/s43762-022-00070-x.
3. Ospina, J. P., **Duque, J. C.**, Botero-Fernández, V., Brusel, M. (2022). Understanding the effect of sociodemographic, natural and built environment factors on cycling accessibility. *Journal of transport geography*, 102, 103386. doi.org/10.1016/j.jtrangeo.2022.103386.
4. Straulino, D., Saldarriaga, J. C., Gómez, J. A., **Duque, J. C.**, O'Clery, N. (2022). Uncovering commercial activity in informal cities. *Royal Society Open Science*, 9(11), 211841. doi.org/10.1098/rsos.211841.
5. Ospina, J. P., **Duque, J. C.**, Botero-Fernández, V., Montoya, A. (2022). The maximal covering bicycle network design problem. *Transportation research part A: policy and practice*, 159, 222-236. doi.org/10.1016/j.tra.2022.02.004.
6. Quiñones, M., Posso, C. M., Mancera, N., **Duque, J. C.**, Medina, C. A. (2022). Intragenerational mobility and the concept of the equalization of longer-term incomes: An estimation for a developing country. *Socio-Economic Planning Sciences*, 101463. doi.org/10.1016/j.seps.2022.101463.
7. Sapena, M., Kühnl, M., Wurm, M., Patino, J. E., **Duque, J. C.**, Taubenböck, H. (2022). Empiric recommendations for population disaggregation under different data scenarios. *Plos one*, 17(9), e0274504. doi.org/10.1371/journal.pone.0274504.
8. **Duque, J. C.**, Lozano-Gracia, N., Patino, J. E., & Restrepo, P. (2022). Urban form and productivity: What shapes are Latin-American cities?. *Environment and Planning B: Urban Analytics and City Science*, 49(1), 131-150. doi.org/10.1177/2399808321999309.
9. Prieto Curiel, R., Patino, J. E., **Duque, J. C.**, & O'Clery, N. (2021). The heartbeat of the city. *PLoS One*, 16(2), e0246714. doi.org/10.1371/journal.pone.0246714.
10. Martínez L, Valencia I, Trofimoff V, Vidal N, Robles E, **Duque J. C.**, Sarmiento OL, Tuiran A. (2021). Quality of life, health, and government perception during COVID-19 times: Data from Colombia. *Data in Brief*, 107268. doi.org/10.1016/j.dib.2021.107268.
11. Restrepo, D. E., **Duque, J. C.**, & Church, R. (2022). Optimal region design to foster industrial diversification. *Regional Studies*, 56(7), 1125-1141. doi.org/10.1080/00343404.2021.1986210.
12. Hong, A., Martinez, L., Patino, J. E., **Duque, J. C.**, & Rahimi, K. (2021). Neighbourhood green space and health disparities in the global South: Evidence from Cali, Colombia. *Health & Place*, 72, 102690. doi.org/10.1016/j.healthplace.2021.102690.
13. Patino, J. E., Hong, A., **Duque, J. C.**, Rahimi, K., Zapata, S., & Lopera, V. M. (2021). Built environment and mortality risk from cardiovascular disease and diabetes in Medellín, Colombia: An ecological study. *Landscape and Urban Planning*, 213, 104126. doi.org/10.1016/j.landurbplan.2021.104126.
14. Gómez, J. A., Guan, C., Tripathy, P., **Duque, J. C.**, Passos, S., Keith, M., & Liu, J. (2021). Analyzing the spatiotemporal uncertainty in Urbanization predictions. *Remote Sensing*, 13(3), 512. doi.org/10.3390/rs13030512.
15. Quinones, M., Martínez, L. M., **Duque, J. C.**, & Mejía, O. (2021). A targeting policy for tackling inequality in the developing world: Lessons learned from the system of cross-subsidies to fund utilities in Colombia. *Cities*, 116, 103306. doi.org/10.1016/j.cities.2021.103306.
16. Rueda-Plata, D., González, D., Acevedo, A. B., **Duque, J. C.**, & Ramos-Pollán, R. (2021). Use of deep learning models in street-level images to classify one-story unreinforced masonry buildings based on roof diaphragms. *Building and Environment*, 189, 107517. doi.org/10.1016/j.buildenv.2020.107517.
17. Ospina, J. P., Botero-Fernández, V., **Duque, J. C.**, Brusel, M., & Grigolon, A. (2020). Understanding cycling travel distance: The case of Medellín city (Colombia). *Transportation research part D: transport and environment*, 86, 102423. doi.org/10.1016/j.trd.2020.102423.
18. Gómez, J. A., Patiño, J. E., **Duque, J. C.**, & Passos, S. (2019). Spatiotemporal modeling of urban growth using machine learning. *Remote Sensing*, 12(1), 109. doi.org/10.3390/rs12010109.
19. **Duque, J. C.**, Lozano-Gracia, N., Patino, J. E., & Cadavid, P. R. (2021). Institutional fragmentation and metropolitan coordination in Latin American cities: Are there links with city productivity?. *Regional Science Policy & Practice*, 13(4), 1096-1128. doi.org/10.1111/rsp3.12314.
20. Gonzalez, D., Rueda-Plata, D., Acevedo, A. B., **Duque, J. C.**, Ramos-Pollan, R., Betancourt, A., & Garcia, S. (2020). Automatic detection of building typology using deep learning methods on street level images. *Building and Environment*, 177, 106805. doi.org/10.1016/j.buildenv.2020.106805.
21. Ospina-Zapata, J. P., López-Ríos, V. I., Botero-Fernández, V., & **Duque, J. C.** (2020). A database to analyze cycling routes in Medellín, Colombia. *Data in brief*, 32, 106162. doi.org/10.1016/j.dib.2020.106162.
22. **Duque, J. C.**, Lozano-Gracia, N., Patino, J. E., Restrepo, P., & Velasquez, W. A. (2019). Spatiotemporal dynamics of urban growth in Latin American cities: An analysis using nighttime light imagery. *Landscape and*

- Urban Planning, 191, 103640. doi.org/10.1016/j.landurbplan.2019.103640.
23. **Duque, J. C.**, Laniado, H., & Polo, A. (2018). S-maup: Statistical test to measure the sensitivity to the modifiable areal unit problem. *PLoS one*, 13(11), e0207377. doi.org/10.1371/journal.pone.0207377.
 24. **Duque, J. C.**, Vélez-Gallego, M. C., & Echeverri, L. C. (2018). On the performance of the subtour elimination constraints approach for the p-regions problem: A computational study. *Geographical Analysis*, 50(1), 32–52. doi.org/10.1111/gean.12132.
 25. Arribas-Bel, D., Patino, J. E., & **Duque, J. C.** (2017). Remote sensing-based measurement of Living Environment Deprivation: Improving classical approaches with machine learning. *PLoS one*, 12(5), e0176684. doi.org/10.1371/journal.pone.0176684.
 26. **Duque, J. C.**, Patino, J. E., & Betancourt, A. (2017). Exploring the potential of machine learning for automatic slum identification from VHR imagery. *Remote Sensing*, 9(9), 895. doi.org/10.3390/rs9090895.
 27. She, B., **Duque, J. C.**, & Ye, X. (2017). The network-max-P-regions model. *International Journal of Geographical Information Science*, 31(5), 962–981. doi.org/10.1080/13658816.2016.1252987.
 28. **Duque, J. C.**, & Hierro, M. (2016). Shocks and spatial regime fades in Spain's international migration distribution. *International Migration*, 54(6), 26–42. doi.org/10.1111/imig.12254.
 29. Ramos, R., **Duque, J. C.**, & Nieto, S. (2012). Decomposing the rural-urban differential in student achievement in Colombia using PISA microdata. *Estudios de Economía Aplicada*, 34(2), 379–411. doi.org/10.25115/ea.v34i2.3044.
 30. **Duque, J. C.**, Jetter, M., & Sosa, S. (2015). UN interventions: The role of geography. *The Review of International Organizations*, 10(1), 67–95. doi.org/10.1007/s11558-014-9199-z.
 31. **Duque, J. C.**, Ye, X., & Folch, D. C. (2015). spMorph: An exploratory space-time analysis tool for describing processes of spatial redistribution. *Papers in Regional Science*, 94(3), 629–651. doi.org/10.1111/pirs.12088.
 32. **Duque, J. C.**, Patino, J. E., Ruiz, L. A., & Pardo-Pascual, J. E. (2015). Measuring intra-urban poverty using land cover and texture metrics derived from remote sensing data. *Landscape and Urban Planning*, 135, 11–21. doi.org/10.1016/j.landurbplan.2014.11.009.
 33. Patino, J. E., **Duque, J. C.**, Pardo-Pascual, J. E., & Ruiz, L. A. (2014). Using remote sensing to assess the relationship between crime and the urban layout. *Applied Geography*, 55, 48–60. doi.org/10.1016/j.apgeog.2014.08.016.
 34. Royuela, V., & **Duque, J. C.** (2013). HouSI: Heuristic for delimitation of housing submarkets and price homogeneous areas. *Computers, Environment and Urban Systems*, 37, 59–69. doi.org/10.1016/j.compenvurb-sys.2012.04.005.
 35. Patino, J. E., & **Duque, J. C.** (2013). A review of regional science applications of satellite remote sensing in urban settings. *Computers, Environment and Urban Systems*, 37, 1–17. doi.org/10.1016/j.compenvurb-sys.2012.06.003.
 36. **Duque, J. C.**, Anselin, L., & Rey, S. J. (2012). The max-p-regions problem. *Journal of Regional Science*, 52(3), 397–419. doi.org/10.1111/j.1467-9787.2011.00743.x.
 37. Duque, L. C., **Duque, J. C.**, & Suriñach, J. (2013). Learning outcomes and dropout intentions: an analytical model for Spanish universities. *Educational studies*, 39(3), 261–284. doi.org/10.1080/03055698.2012.724353.
 38. **Duque, J. C.**, Church, R. L., & Middleton, R. S. (2011). The p-Regions Problem. *Geographical Analysis*, 43(1), 104–126. doi.org/10.1111/j.1538-4632.2010.00810.x.
 39. **Duque, J. C.**, Aldstadt, J., Velasquez, E., Franco, J. L., & Betancourt, A. (2011). A computationally efficient method for delineating irregularly shaped spatial clusters. *Journal of Geographical Systems*, 13, 355–372. doi.org/10.1007/s10109-010-0137-1.
 40. Ramos, R., **Duque, J. C.**, & Surinach, J. (2010). Is the wage curve formal or informal? Evidence for Colombia. *Economics Letters*, 109(2), 63–65. doi.org/10.1016/j.econlet.2010.08.004.
 41. **Duque, J. C.**, Rey, S. J., & Gómez, D. A. (2009). Identifying industry clusters in Colombia based on graph theory. *Ensayos Sobre Política Económica*, 27(59), 14–45. doi.org/10.32468/Espe.5901.
 42. **Duque, J. C.**, Ramos, R., & Suriñach, J. (2007). Supervised regionalization methods: A survey. *International Regional Science Review*, 30(3), 195–220. doi.org/10.1177/0160017607301605.
 43. Clar, M., **Duque, J. C.**, & Moreno, R. (2007). Forecasting business and consumer surveys indicators—a time-series models competition. *Applied Economics*, 39(20), 2565–2580. doi.org/10.1080/00036840600690272.
 44. **Duque, J. C.**, Ramos, R., & Suriñach, J. (2006). Wages and productivity: the role of labour market institutions in OECD countries. *Empirica*, 33, 231–243. doi.org/10.1007/s10663-006-9004-1.
 45. **Duque, J. C.**, Artís, M., & Ramos, R. (2006). The ecological fallacy in a time series context: evidence from Spanish regional unemployment rates. *Journal of Geographical Systems*, 8, 391–410. doi.org/10.1007/s10109-006-0033-x.
 46. Royuela, V., **Duque, J. C.**, & Surinach, J. (2006). Regional Science in Germany During the Nineties—are German Publication Patterns Different?. *Spatial Research and Planning*, 64(2), 77–92. doi.org/10.1007/BF03183166.
 47. **Duque, J. C.**, Ramos, R., & Suriñach, J. (2005). What Have We Learned from the Changeover to the Euro?:

Lessons for Accession Countries from Catalanian Firms. *Eastern European Economics*, 43(1), 34-58. doi.org/10.1080/00128775.2005.11041098.

48. Ramos, R., Royuela, V., & **Duque, J. C.** (2005). Regional science research in the Nordic countries in the light of some chosen international journals. *European Journal of Spatial Development*, 3(2), 1-21. doi.org/10.5281/zenodo.5127636.
49. Royuela, V., **Duque, J. C.**, & Ramos, R. (2005). Regional and urban research in Italy during the nineties: evidence from publications in nine top international journals. *Scienze Regionali*, (2005/3).
50. Suriñach, J., **Duque, J. C.**, Ramos, R., & Royuela, V. (2003). Publication patterns in regional and urban analysis: have topics, techniques and applications changed during the 1990s?. *Regional Studies*, 37(4), 351-363. doi.org/10.1080/0034340032000074398.

BOOK CHAPTERS & REPORTS

1. **Duque J. C.**, Patino J.E., Restrepo, D.E., Uribe M. (2018). Identificación de Municipios a intervenir en un escenario de post-acuerdo (Identification of Municipalities to intervene in a post-agreement scenario). In Giraldo, Jorge, editor, Contribuciones de la Universidad a la Agenda de la Habana (Contributions of the University to the Havana Agenda). Universidad EAFIT, pp 195-234. *ISBN: 978-958-720-555-8*.
2. **Duque J. C.**, Betancourt A., Marín F. H. (2018). An Algorithmic Approach for Simulating Realistic Irregular Lattices. In Thill, Jean-Claude and Dragicevic, Suzana, editor, GeoComputational Analysis and Modeling of Regional Systems. Springer International Publishing AG, Gewerbestrasse Switzerland, pp 277-303. *ISBN: 978-3-319-59509-2*. doi.org/10.1007/978-3-319-59511-5_15.
3. **Duque J. C.**, García G. A., Herrera-Idárraga P., López-Bazo E. (2016). Heterogeneidad regional en las diferencias por género de las tasas de desempleo. In Arango-Thomas L. E., Castellani F. and Lora-Torres E., editor, Desempleo femenino en Colombia. Banco de la República, Bogotá, pp 101-134. *ISBN: 978-958-664-342-9*.
4. **Duque, J. C.**, Royuela, V., Noreña, M. (2012). A Stepwise Procedure to Determinate a Suitable Scale for the Spatial Delimitation of Urban Slums. In Fernández-Vazquez, E. and Rubiera-Morollón, F., editor, Defining the Spatial Scale in Modern Regional Analysis. New Challenges from Data at Local Level. Springer, Berlin Heidelberg, pp 237-254. *ISBN: 978-3-642-31994-5*. doi.org/10.1007/978-3-642-31994-5.
5. Villegas, L. C., **Duque, J. C.** (2009). Diez años de atentos a la infraestructura de Colombia. In Echavarría, S. H., editor, Seguridad pública: Tres aproximaciones. Centro de Análisis Político, *ISBN: 958-44-5928-2*.

6. **Duque, J. C.**, Rey, S. J. (2008). A network based approach towards industry clustering. In Blien, U. and Maier, G., editors, The economics of regional clusters: Networks, technology and policy (New Horizons in Regional Science Series). Edward Elgar Publishing Ltd (1 Jun 2008), *ISBN-10: 1847205151, ISBN-13: 978-1847205155*.
7. **Duque, J. C.**, Royuela, V. (2006). La investigación como motor de desarrollo. In Calderón, G. and Castaño, G. A, editors, Investigación en Administración en América Latina: Evolución y resultados. Universidad Nacional de Colombia, Manizales. *ISBN: 958-8041-24-3*.
8. Surinach, J., **Duque, J. C.**, Ramos, R., Royuela, V. (2002). Topics, techniques and applications in urban and regional science in the nineties: A bibliometric analysis for selected international journals. In Márquez, J. M. M., editor, Cambios regionales en la Unión Europea y nuevos retos territoriales. Instituto de Estudios Fiscales, Madrid. *ISBN: 84-8008-104-X*.

INVITED LECTURES

1. **Duque, J.C.** (2022). Translational Knowledge to Shape Sustainable Urban Futures. International Conference on Sustainable Development (ICSD). New York. USA. [Watch](#).
2. **Duque, J.C.** (2022). Celebrating success with the project PEAK Urban. Doing Science with Colombia. Natural History Museum. London. UK.
3. **Duque, J.C.** (2022). The paradox: Economic growth that endangers the future of research in Colombia. Urban ARC 2022 | Beyond Binaries. Bangalore. India.
4. **Duque, J.C.** (2022). End poverty, let's talk about the SDGs. Antioquia 2040 Agenda. Government of Antioquia. Medellin. Colombia. [Watch](#).
5. **Duque, J.C.** (2022). The challenge of closing territorial gaps and the role of academia. Eafit University. Medellin. Colombia.
6. **Duque, J.C.** (2022). Intelligent design of bike path networks. Medellin Council. Medellin. Colombia. [Watch](#).
7. **Duque, J.C.** (2022). Advances and challenges of regional and urban studies in Colombia. Center for Regional Economic Studies. Cartagena. Colombia.
8. **Duque, J.C.** (2022). Uncovering commercial activity in informal cities. ICESI University. Cali. Colombia.
9. **Duque, J.C.** (2021). Using artificial intelligence to face challenges of cities in countries of the global south. Government of Antioquia. Medellin. Colombia.
10. **Duque, J.C.** (2021). Prediction: New forms of data and new ways of analysis for more resilient cities. 26th UN Climate Change Conference of the Parties (COP26). Glasgow. UK. [Watch](#).
11. **Duque, J.C.** (2020). The P-innovation Ecosystems Problem. ICESI University. Cali. Colombia.

12. **Duque, J.C. (2019).** The science behind the design of territorial fabrics. The United Nations Economic Commission for Latin America and the Caribbean. Medellín. Colombia.
13. **Duque, J.C. (2019).** Alternative sources of information for applied socioeconomic analysis. ICESI University. Cali. Colombia.
14. **Duque, J.C. (2018).** Use of Remote Sensing Imagery in socioeconomic studies: The Rise-group research agenda. University of Liverpool. Liverpool. UK.
15. **Duque, J.C. (2018).** The p-regions models. In Functional regions in Colombia for better territorial investment. National Department of Planning, European Union, GIZ, RIMISP. Bogota. Colombia.
16. **Duque, J.C. (2018).** City + big data + supercomputing + creativity: A tour of the RiSE group's research agenda in its exploration of new ideas to contribute to the goal of achieving cities for all. Eafit University. Medellín. Colombia. [Watch](#).
17. **Duque, J.C. (2017).** Latin-American cities: Background Papers on City form/metropolitan coordination and productivity. Authors' Workshop for the Flagship Study on Cities, Productivity and Growth in Latin America and the Caribbean (LAC). The World Bank. Washington. USA.
18. **Duque, J.C. (2017).** Alternative sources of information for applied socioeconomic analysis. BBVA Foundation Seminar. Valencia. Spain.
19. **Duque, J.C. (2017).** New sources of information and new analysis techniques. Barcelona University. Barcelona. Spain.
20. **Duque, J.C. (2017).** The family of p-region models for spatial aggregation. Colombian Association of Operations Research. Medellín. Colombia.
21. **Duque, J.C. (2017).** S-maup: Statistical test to measure the sensitivity to the modifiable areal unit problem. Barcelona University. Barcelona. Spain.
22. **Duque, J.C. (2016).** Exploring the potential of machine learning for slum identification using VHR imagery. United Nations Conference on Housing and Sustainable Urban Development (Habitat III). Quito. Ecuador.
23. **Duque, J.C. (2015).** The Challenge of Libraries for Research and Innovation. What do researchers expect from libraries in the future?. Book Fair. Medellín. Colombia.
24. **Duque, J.C. (2014).** Growth forecast model of the urban sprawl of the Valle de Aburrá Metropolitan Area. International Finance Corporation. The World Bank Group. Medellín. Colombia.
25. **Duque, J.C. (2014).** Planning a system of cities in Urabá-Colombia: Population, urban and economic growth. The Ibero-American General Secretariat. Madrid. Spain.
26. **Duque, J.C. (2013).** Designing a system of cities to foster social welfare and economic growth in Urabá (Colombia). International workshop on national urban policies. UN-Habitat Governing Council. Nairobi. Kenya.
27. **Duque, J.C. (2013).** The "p-regions" and "max-p-regions" models and their application in the design of spatial units for socioeconomic studies. ICESI University. Cali. Colombia.
28. **Duque, J.C. (2013).** spMorph: An exploratory space-time analysis tool for describing processes of spatial redistribution. Fedesarrollo. Bogota. Colombia.
29. **Duque, J.C. (2012).** What is the interest of the countries of the north in the problems of the south?. URBAM. Medellín. Colombia.
30. **Duque, J.C. (2011).** The p-regions and max-p-regions models and their application in the design of spatial units for socio-economic studies. Del Rosario University. Bogota. Colombia.
31. **Duque, J.C. (2010).** Space and Industrial Activity. In Master in Economics (Univ. Barcelona).
32. **Duque, J.C. (2009).** Software para el análisis de la demografía empresarial en Cataluña. In Seminarios del Grupo de Análisis Cuantitativo Regional (Univ. Barcelona).
33. **Duque, J.C. (2009).** Is the wage curve formal or informal? Evidence for Colombia. In Seminarios del Grupo de Análisis Cuantitativo Regional (Univ. Barcelona). Spain.
34. **Duque, J.C. (2009).** Python: Una nueva alternativa de programación para el tratamiento de grandes volúmenes de datos estadísticos. In Seminarios del Grupo de Análisis Cuantitativo Regional (Univ. Barcelona). Spain.
35. **Duque, J.C. (2009).** Max-p region problem In Seminar of the Reference Network for Research in Applied Economics, Espai de Recerca en Economia, Facultat d'Economia i Empres. Universitat de Barcelona, Spain.
36. **Duque, J.C. (2009).** Models d'agregaciocal In Seminar of the Reference Network for Research in Applied Economics, Espai de Recerca en Economia, Facultat d'Economia i Empres. Universitat de Barcelona, Spain.
37. **Duque, J.C. (2009).** Eines informatiques per a l'exploració de dades geografiques In Seminar of the Reference Network for Research in Applied Economics, Espai de Recerca en Economia, Facultat d'Economia i Empres. Universitat de Barcelona, Spain.
38. **Duque, J.C. (2009).** Identificación de Clusters Industriales en Colombia usando la Metodología Duque, Rey (2008). In Seminario de Economía. Banco de la República, Medellín, Colombia.
39. **Duque, J.C. (2008).** Tópicos en análisis económico de datos espaciales: El caso del Problema de la Unidad Espacial Modificable (PUEM). In Banco de la República, Medellín, Colombia.

40. **Duque, J.C. (2008)**. Software para la investigación. In Universidad Nacional de Colombia, Manizales, Colombia.
41. **Duque, J.C. (2008)**. How to use a version control system (SVN) in collaborative projects. In Research Institute of Applied Economics (IREA), Barcelona, Spain.
42. **Duque, J.C. (2008)**. A new GIS-based methodology to analyze transitional economic patterns. In Research Institute of Applied Economics (IREA), Barcelona, Spain.
43. **Duque, J.C. (2008)**. Identification of network-based industry clusters using I-O tables. In Regional Quantitative Analysis Research Group (AQR-IREA), Barcelona, Spain.
44. **Duque, J.C. (2005)**. Contiguity constrained clustering. In Quantitative Methods in Geography Research. San Diego State University, San Diego, CA, USA.
45. **Duque, J.C. (2004)**. Analytical regionalization models: A methodological proposal and empirical links to the MAUP. In Syllabus for Spatial Analysis. University of Wisconsin at Madison, Madison, WI, USA.
8. **Duque, J.C., Patino, J.E., Ruiz, L.A., Pardo, J.E. (2013)**. Quantifying slumness with remote sensing data. In 60th Annual North American Meetings of the Regional Science Association International, Atlanta, USA.
9. **Duque, J.C., Patino, J.E., Ruiz, L.A., Pardo, J.E. (2013)**. Improving spatial crime models via remote sensing. In III Coloquio binacional sobre Economía y Empresa, Medellín, Colombia.
10. **Duque, J.C., Marin, F., Betancourt, A. (2012)**. Stochastic differential equations, fractal geometry and geocomputation for simulating real maps. In International Meetings of Mathematics and Physics, Florencia, Colombia.
11. Nieto, S., Ramos, R., **Duque, J.C. (2012)**. Rural-urban differences in educational outcomes: Evidence for Colombia using PISA microdata. In 52nd European Congress of the Regional Science Association International, Bratislava, Slovakia.
12. **Duque, J.C., Ramírez, A., Betancourt, A. (2012)**. Spatially disaggregated forecast of demand for piped water in the metropolitan area of Medellín-Colombia. In VI World Conference Spatial Econometrics Association, Salvador, Brazil.
13. Ramos, R., **Duque, J.C., Nieto, S. (2012)**. Decomposing the Rural-urban differences in student achievement in Colombia using PISA microdata. In VI World Conference Spatial Econometrics Association, Salvador, Brazil.
14. Ramos, R., **Duque, J.C., Nieto, S. (2012)**. Un análisis de las diferencias rurales y urbanas en el rendimiento educativo de los estudiantes colombianos a partir de los microdatos de PISA. In XXI Jornadas de la Asociación de Economía de la Educación, Oporto, Portugal.
15. Middleton, R., **Duque, J.C. (2011)**. A million different solutions for a single covering problem: Why high resolution data is critical for optimizing early warning sirens. In 58th Annual North American Meetings of the Regional Science Association International, Miami, USA.
16. Betancourt, A., **Duque, J.C., Marín, F.H. (2011)**. An algorithmic approach for simulating realistic irregular lattices. In 58th Annual North American Meetings of the Regional Science Association International, Miami, USA.
17. **Duque, J.C., Aparicio, S., Betancourt, A., Gómez D.F. (2011)**. Merging system dynamics and I-O analysis to forecast the role of industry clusters in Medellín's Metropolitan Area. In 58th Annual North American Meetings of the Regional Science Association International, Miami, USA.
18. **Duque, J.C., Janikas, M.V., Rosenshein, L., Scott, L. (2011)**. New tools to create a W matrix that represents the socioeconomic reality of the study data. In

PROCEEDINGS & KEY PRESENTATIONS

1. **Duque, J.C., Laniado, H., Polo, A. (2022)**. S-maup: Statistical test to measure the sensitivity to the modifiable areal unit problema. XV International Seminar on Urban and Regional Research (ACIUR). Bogota, Colombia.
2. Giraldo-Quintero, A., Lalinde, J.G., Sierra-Sosa, D., **Duque, J.C. (2021)**. Using quantum computing to solve NP-hard problems in regional science: The Maximal-Covering Location Problem and the p-regionsproblem. In 68th Annual North American Meetings of the Regional Science Association International, Denver, USA.
3. Canavire-Bacarreza, G., **Duque, J.C., Urrego, J. (2020)**. Moving Citizens and Deterring Criminals: Innovation in Public Transport Facilitie. American Economic Association Annual Meeting. San Diego, USA.
4. **Duque, J.C., Lozano-Gracia, N., Patino, J.E., Restrepo, P. (2019)**. Urban form and productivity: in what shape are Latin-American cities?. In 66th Annual North American Meetings of the Regional Science Association International, Pittsburgh, USA.
5. Janikas, M.V., **Duque, J.C., Chin, L.H. (2015)**. An evaluation of spatially-constrained regionalization routines. In Association of American Geographers annual meeting, Chicago, USA.
6. **Duque, J.C., Rey, S.J. (2014)**. ClusterPy and PySAL Integration. In 61st Annual North American Meetings of the Regional Science Association International, Washington, USA.
7. **Duque, J.C., Patino, J.E., Ruiz, L.A., Pardo, J.E. (2013)**. Improving spatial crime models via remote sensing. In
- 60th Annual North American Meetings of the Regional Science Association International, Atlanta, USA.
8. **Duque, J.C., Patino, J.E., Ruiz, L.A., Pardo, J.E. (2013)**. Quantifying slumness with remote sensing data. In 60th Annual North American Meetings of the Regional Science Association International, Atlanta, USA.
9. **Duque, J.C., Patino, J.E., Ruiz, L.A., Pardo, J.E. (2013)**. Improving spatial crime models via remote sensing. In III Coloquio binacional sobre Economía y Empresa, Medellín, Colombia.
10. **Duque, J.C., Marin, F., Betancourt, A. (2012)**. Stochastic differential equations, fractal geometry and geocomputation for simulating real maps. In International Meetings of Mathematics and Physics, Florencia, Colombia.
11. Nieto, S., Ramos, R., **Duque, J.C. (2012)**. Rural-urban differences in educational outcomes: Evidence for Colombia using PISA microdata. In 52nd European Congress of the Regional Science Association International, Bratislava, Slovakia.
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13. Ramos, R., **Duque, J.C., Nieto, S. (2012)**. Decomposing the Rural-urban differences in student achievement in Colombia using PISA microdata. In VI World Conference Spatial Econometrics Association, Salvador, Brazil.
14. Ramos, R., **Duque, J.C., Nieto, S. (2012)**. Un análisis de las diferencias rurales y urbanas en el rendimiento educativo de los estudiantes colombianos a partir de los microdatos de PISA. In XXI Jornadas de la Asociación de Economía de la Educación, Oporto, Portugal.
15. Middleton, R., **Duque, J.C. (2011)**. A million different solutions for a single covering problem: Why high resolution data is critical for optimizing early warning sirens. In 58th Annual North American Meetings of the Regional Science Association International, Miami, USA.
16. Betancourt, A., **Duque, J.C., Marín, F.H. (2011)**. An algorithmic approach for simulating realistic irregular lattices. In 58th Annual North American Meetings of the Regional Science Association International, Miami, USA.
17. **Duque, J.C., Aparicio, S., Betancourt, A., Gómez D.F. (2011)**. Merging system dynamics and I-O analysis to forecast the role of industry clusters in Medellín's Metropolitan Area. In 58th Annual North American Meetings of the Regional Science Association International, Miami, USA.
18. **Duque, J.C., Janikas, M.V., Rosenshein, L., Scott, L. (2011)**. New tools to create a W matrix that represents the socioeconomic reality of the study data. In

- 51st European Congress of the Regional Science Association International, Barcelona, Spain.
19. **Duque, J.C.**, García, J.R., Surinach, J. (2011). Propuesta metodológica para la desagregación espaciotemporal de los indicadores de demografía empresarial In XIV Encuentros de Economía Aplicada, Huelva, Spain.
 20. Janikas, M.V., **Duque, J.C.**, Scott, L., Rosenshein, L. (2011). Space-Time Partitioning in ArcGIS 10.1. In AAG Annual Meeting, Seattle, USA.
 21. **Duque, J.C.**, Royuela, V., Noreña, M. (2010). A step-wise tool for spatial delimitation of poverty areas. Medellin (Colombia) as a case study. In Seminar of Spatial Econometrics in honor of Doctor J.H.P. Paelinck, Oviedo, Spain.
 22. Royuela, V., **Duque, J.C.** (2010). Housing submarkets and price homogeneous areas. In 50th ERSA conference, Jönköping, Sweden.
 23. Betancourt, A., **Duque, J.C.**, Franco, J.L. (2010). A variation of the Kohonen's Self Organizing Maps to guarantee spatial contiguity in zone design problems. In Congreso Internacional de Matemáticas Aplicadas e Informática, San Andrés, Colombia.
 24. **Duque, J.C.**, Betancourt, A., Dev, B. (2010). Geogrouper: Zone design software. In Congreso Internacional de Matemáticas Aplicadas e Informática, San Andrés, Colombia.
 25. **Duque, J.C.**, Dev, B. (2009). ClusterPy: Python library of spatial clustering algorithms. In 56th Annual North American Meetings of the Regional Science Association International, San Francisco, USA.
 26. **Duque, J.C.**, Royuela, V. (2009). Housing submarkets and price homogeneous areas. In 3rd World Conference of the Spatial Econometrics Association, Barcelona, Spain.
 27. **Duque, J.C.**, Anselin, L., Rey, S.J. (2009). The Max-p-region Problem. In First Conference of the Regional Science Association of the Americas: RSAmericas, Cartagena, Colombia.
 28. **Duque, J.C.**, Velásquez, H., Franco, J.L., Betancourt, A. (2009). Computationally efficient formulation for the Aldstadt and Getis AMOEBA algorithm. In First Conference of the Regional Science Association of the Americas: RSAmericas, Cartagena, Colombia.
 29. **Duque, J.C.**, Gómez, D.A. (2009). Identifying Industry Clusters in Colombia Based on Graph Theory. In First Conference of the Regional Science Association of the Americas: RSAmericas, Cartagena, Colombia.
 30. **Duque, J.C.**, Rey, S.J., Schmidt, C.R. (2008). INCLUSIO: New ways to explore interindustry relationships. In 55th North American Meetings of the Regional Science Association International, New York, USA.
 31. **Duque, J.C.**, Church, R.L., Middleton, R.S. (2006). The p-regions problem. In XIV Latin-Ibero American Congress on Operations Research (CLAIO 2008), Cartagena, Colombia.
 32. Bernábe, M.B., Duque, J.C., Ramirez, J., Osorio, M.A. (2006). Classification over geographical zones: A combinatorial optimization approach to the regional partitioning problem. In XVIII International Conference on Electronics, Communications and Computers (conielecomp 2008), Puebla, Mexico.
 33. Smirnov, O., **Duque, J.C.**, Rey, S.J. (2006). Regional Capabilities and the Structure of the Californian Economy. In North American Meeting of the Regional Science Association International, Toronto, Canada.
 34. Rey, S.J., Anselin, L., **Duque, J.C.**, Li, X. (2006). Max p-region Based Estimation of Disease Rates. In North American Meeting of the Regional Science Association International, Toronto, Canada.
 35. **Duque, J.C.**, Ye, X. (2006). Identifying Temporal Lag in Analytical Regionalization Procedures. In North American Meeting of the Regional Science Association International, Toronto, Canada.
 36. Bernábe, M.B., Osorio, M.A., **Duque, J.C.** (2006). Clasificación de Zonas Geográficas: Un Enfoque de Optimización Combinatoria para el Problema de Regionalización. In XIII Latin-Ibero American Congress on Operations Research (CLAIO 2006), Montevideo, Uruguay.
 37. Smirnov, O., **Duque, J.C.**, Rey, S.J. (2006). Regional Capabilities and the Structure of California Economy. In Western Economic Association International, San Diego, CA. USA.
 38. Smirnov, O., **Duque, J.C.**, Rey, S.J. (2006). Spatial Analysis of Industrial Clusters in California. In Western Economic Association International, San Diego, CA. USA.
 39. **Duque, J.C.**, Middleton, R.S. (2006). Geography and gerrymandering. A location science approach. In Association of American Geographers annual meeting, Chicago, IL. USA.
 40. **Duque, J.C.**, Church, R.L., Middleton, R.S. (2006). Exact models for the regionalisation problem. In Western Regional Science Association annual meeting, Santa Fe, NM. USA.
 41. Rey, S.J., **Duque, J.C.**, Anselin, L. (2005). Clustering components in the Python Spatial Analysis Library (PySAL). In North American Meeting of the Regional Science Association International, Las Vegas, NV. USA.
 42. **Duque, J.C.**, Rey, S.J. (2005). Network based approaches towards industrial clustering. In North American Meeting of the Regional Science Association International, Las Vegas, NV. USA.
 43. Rey, S.J., **Duque, J.C.**, Smirnov, O., Kim, Y.S., Stephens, P. (2005). Regional analysis in support of economic development. In North American Meeting of the Regional Science Association International, Las Vegas, NV. USA.
 44. **Duque, J.C.**, Royuela, V. (2005). La investigación como motor de desarrollo. In Congreso Iberoamericano de Investigación Administrativa, Colombia.

45. **Duque, J.C.**, Church, R.L. (2004). A new heuristic model for designing analytical regions. In North American Meeting of the Regional Science Association International, Seattle, WA. USA.
46. **Duque, J.C.**, Ramos, R. (2004). Spanish unemployment: Normative versus analytical regionalization procedures. In North American Meeting of the Regional Science Association International, Seattle, WA. USA.
47. **Duque, J.C.**, Ramos, R. (2004). Design of homogenous territorial units: A methodological proposal. In Congress of the European Regional Science Association, Porto, Portugal.
48. **Duque, J.C.**, Ramos, R. (2004). Spanish unemployment: Normative versus analytical regionalization procedures. In Congress of the European Regional Science Association, Porto, Portugal.
49. **Duque, J.C.**, Ramos, R., Surinach, J. (2004). Diseño de unidades territoriales representativas del fenómeno a estudiar: Una propuesta metodológica. In Encuentro de Economía Aplicada, Vigo, Spain.
50. **Duque, J.C.**, Ramos, R., Surinach, J. (2004). Spanish unemployment: Normative versus analytical regionalization procedures. In Encuentro de Economía Aplicada, Vigo, Spain.
51. Surinach, J., **Duque, J.C.**, Ramos, R., Royuela, V. (2004). La investigación regional en España. Rankings de países, instituciones y autores en ciencia regional y urbana para el período 1991-2000. In Reunión de Estudios Regionales, Barcelona, Spain.
52. **Duque, J.C.**, Ramos, R., Surinach, J. (2004). Spanish unemployment: Normative versus analytical regionalization procedures. In Reunión de Estudios Regionales, Barcelona, Spain.
53. **Duque, J.C.**, Ramos, R., Surinach, J. (2003). Diseño de unidades territoriales representativas del fenómeno a estudiar: Una propuesta metodológica. In Reunión de Estudios Regionales, Santander, Spain.
54. Royuela, V., Surinach, J., **Duque, J.C.**, Ramos, R. (2001). Topics, techniques and applications in urban and regional science in the nineties: A bibliometric analysis for selected international journals. In Reunión de Estudios Regionales, Madrid, Spain.
55. Ramos, R., **Duque, J.C.**, Surinach, J. (2001). Las empresas catalanas frente al euro: Localización, tamaño empresarial y proceso de adaptación a la nueva moneda. In Reunión de Estudios Regionales, Madrid, Spain.
56. **Duque, J.C.**, Ollero, J.L., Pons, E., Surinach, J. (2001). El crecimiento económico en la provincia de Barcelona: Un análisis de las diferencias a nivel territorial. In Reunión de Estudios Regionales, Madrid, Spain.

EDITORIAL APPOINTMENTS

1. **2022 - present**: Editorial board member, *Computational Urban Science*.
2. **2018 - present**: Editorial board member, *Investigaciones Regionales (Journal of Regional Research)*.
3. **2012 - present**: Editorial board member, *Computers, Environment and Urban Systems*.
4. **2011 - 2015**: Editorial board member, *Papers in Regional Science*.
5. **2009 - present**: Editorial board member, *International Regional Science Review*.

FUNDED PROPOSALS (PI/KEY ROLES)

1. **2017 - 2022**. GCRF: Building capacity for the future city in developing countries (PEAK), ES/P011055/1, £7,249,665, with Michael Keith (PI), Aromar Revi (Co-I), Changchun Feng (Co-I), Edgar Pieterse (Co-I), **Juan C Duque (Co-I)**, Kazem Rahimi (Co-I), Neave Neave O'Clery (Co-I), Susan Marion Parnell (Co-I), and Tim Schwanen (Co-I).

GRADUATE ADVISING

- **Jairo Alejandro Gómez**, EAFIT University. Colombia. (Postdoctoral Researcher).
- **Mauricio Quinones Dominguez**, EAFIT University. Colombia. (Postdoctoral Researcher).
- **Jorge Eduardo Patiño**, EAFIT University. Colombia. (Postdoctoral Researcher).
- **Juan Pablo Ospina**, EAFIT University. Colombia. (Postdoctoral Researcher).
- **Edwar A. Calderón**, EAFIT University. Colombia. (Postdoctoral Researcher).
- **Santiago Mejía-Dugand**, EAFIT University. Colombia. (Postdoctoral Researcher).
- **Rafael Prieto Curiel**, EAFIT University. Colombia. (Postdoctoral Researcher).
- **Daniel Eduardo Restrepo**, EAFIT University. Colombia. (PhD).
- **Juan Pablo Ospina**, National University of Colombia. Colombia. (PhD).
- **Jorge Eduardo Patiño**, Polytechnic university of Valencia. Spain. (PhD).
- **Bernábe Loranca María Beatriz**, National Autonomous University of Mexico. Mexico. (PhD).
- **Juan Camilo Saldarriaga**, EAFIT University. Colombia. (MS).
- **Jessica Salazar Vásquez**, EAFIT University. Colombia. (MS).
- **Vanessa Echeverri Figueroa**, University of Medellin. (MS).
- **Julian Echeverri Figueroa**, EAFIT University. Colombia. (MS).

- **Carolina Gómez Alvis.** EAFIT University. Colombia. (MS).
- **Manuel Esteban Acevedo Jaramillo.** EAFIT University. Colombia. (MS).
- **Adriano Polo Losada.** EAFIT University. Colombia. (MS).
- **Laura Catalina Echeverri Guzmán.** EAFIT University. Colombia. (MS).
- **Oswaldo J. Zapata.** EAFIT University. Colombia. (MS).
- **Juan C. Arias.** EAFIT University. Colombia. (MS).
- **Carlos A. Sarmiento.** EAFIT University. Colombia. (MS).
- **Alejandro Betancourt.** EAFIT University. Colombia. (MS).
- **Diana Catalina Gutiérrez.** EAFIT University. Colombia. (MS).
- **Jorge Agudelo.** EAFIT University. Colombia. (MS).

MOOCs

- Michael Keith, **Juan C. Duque**, Pengjun Zhao, Aromar Revi, Neave O'Clery, Susan Parnell, Edgar Pieterse, Tim Schwanen, Gautam Bhan (**2022**). Shaping Urban Futures [MOOC]. Coursera. [Watch](#).