

Datos de Contacto

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Professional Profile

I am a civil engineer specialized in the modeling and optimization of transportation systems, with experience in civil works and software development for spatial accessibility analysis. Currently, as a contracted researcher at the University of Castilla-La Mancha, my work focuses on developing Mobility as a Service (MaaS) solutions, aimed at improving accessibility in rural and peri-urban areas of Castilla-La Mancha, Spain. I utilize mobile phone Big Data and advanced tools such as Python, MATLAB, Pandas, ArcGIS, Docker, and OSRM for territorial analysis, mobility problem identification, and the proposal of customized solutions that optimize transportation and accessibility.

I have developed my own software, DGIS, a tool for analyzing spatial accessibility in public transport systems, and I have collaborated on the development of business software such as Productivos.org, a platform designed for business evaluation and training. My work has been presented at various international conferences, and my research focuses on providing sustainable solutions for transportation planning in low-density population regions.

My areas of expertise include:

- **Transportation Modeling and Optimization:** Route planning, improving accessibility, and using mathematical models for mobility decision-making.
- **Territorial Analysis and Rural Zoning:** Using methods like Ward hierarchical clustering to classify territories and design transport strategies adapted to local characteristics.
- **Big Data Applied to Mobility:** Analyzing transport supply and demand, traveler behavior, and user classification by sectors using large volumes of data.
- **Problem Identification and Solution Proposals:** Using massive data to detect transportation issues and design optimal solutions.

Accessibility Software Development: Designing tools like DGIS for public transport planning.

I hold a degree in Civil Engineering from Pontificia Universidad Javeriana in Cali, Colombia, and a Master's in Transport, Territory, and Urbanism from the Universitat Politècnica de València, Spain. Currently, I am pursuing a Ph.D. in Territory, Infrastructure, and Environment at the University of Castilla-La Mancha, in the School of Civil Engineering at the Ciudad Real campus, where I am also a contracted researcher.

Professional Experience

Contracted Researcher (02/2023 - Present)

University of Castilla-La Mancha, Ciudad Real, Spain

Development of demand-responsive transport (DRT) models and MaaS solutions for rural areas. Programming in Python and MATLAB, territorial analysis with ArcGIS, and Big Data. Route optimization and improvement of accessibility in low-density population areas.

Civil Engineer (01/2021 - 12/2021)

Cali, Colombia

Management and supervision of civil projects, including design using AutoCAD and Revit. Civil works management for the construction of residential projects.

Resident Civil Engineer (12/2016 - 06/2017)

Constructora Bolívar, Cali, Colombia

Supervision of residential construction projects. Management of resources and personnel on-site.

FUNDACIÓN PRODUCTIVOS.ORG (2016 - 2019)

Cali, Colombia, Valle del Cauca

Engineering Coordinator, Editor, and Auditor

- Audits and software control.
- Internal program account reviews using data analysis software.
- Website and database management for the company.
- Resolution of software engineering and programming issues related to the company's website and hosting.

Education

Bachelor's Degree: Civil Engineering (03/2018)

Pontificia Universidad Javeriana, Cali, Colombia

Focus on road design and infrastructure.

Thesis: *"Design of the Spatial Distribution of MIO System Routes According to the Perceived Service Quality in Commune 18."*

Grade: 4.9/5.

<https://www.davidadejandroramirezcajigas.com/disenio-de-la-distribucion-espacial-de-las-rutas-del-sistema-mio-de-acuerdo-con-la-calidad-del-servicio-percibido-en-la-comuna-18-trabajo-de-grado-tesis-de-grado/>

Master's Degree: Transport, Territory, and Urbanism (01/2022)

Universitat Politècnica de València, Spain

Thesis: *"Development of the DGIS Tool for Evaluating Public Transport Accessibility. Practical Application to Santiago de Cali (Colombia)."*

Grade: 10/10.

<https://www.davidadejandroramirezcajigas.com/desarrollo-de-herramienta-dgis-para-la-evaluacion-la-de-laaccesibilidad-del-transporte-publico-colectivo-aplicacionpractica-a-santiago-de-cali-colombia-trabajo-fin-de-master-tesis-maestria/>

Ph.D. Student: Territory, Infrastructure, and Environment (Ongoing)

University of Castilla-La Mancha, Ciudad Real, Spain

Research on Mobility as a Service (MaaS) solutions in rural and peri-urban areas.

Courses and Training

Basic Level Intensive Course in Revit Architecture (In-person) (2019)

Universitat Politècnica de València, Spain

Airport Engineering: Airside Design (Online) (2020)

EdX by ICAO (International Civil Aviation Organization), online

Topics covered: Airport planning and design.

Offered by UPValenciaX in collaboration with the Universitat Politècnica de València.

English as a Second Language, Semester Program (In-person) (July 2022 - December 2022)

University of Calgary, Canada

Level: Low Intermediate and Intermediate

Total hours: 275 hours.

Curso: MATLAB Onramp (online) (2023)

MathWorks.com

Introducción al uso de MATLAB para análisis y programación.

Skills

- Programming: Python, MATLAB, Pandas, Docker
- Geographic Information Systems: ArcGIS Pro, QGIS
- Transport Modeling: OSRM
- Design: AutoCAD, AutoCAD Civil, Revit
- Big Data Applied to Mobility: Mobile antenna data analysis
- Competent in MATLAB, Revit, AutoCAD, AutoCAD Civil, Microsoft Excel, Microsoft Word, Microsoft PowerPoint, QGIS, and ArcGIS
- Public transport and route design: Buses, trains, bicycles, and pedestrian pathways
- Port design: Maritime cargo and yacht harbors
- Urban planning: Integrating transportation systems
- City design: Walkable cities and people-centered urban spaces
- Urbanism, city, and management
- Beach restoration and coastal management

Projects and Software Developed

DGIS - (Author) Spatial Accessibility Analysis Software that evaluates accessibility in public transport systems using spatial data.

<https://www.davidalejandroramirezcajigas.com/dgis-software-tutorial/>

Collaboration on the <https://www.productivos.org/> project

Idiomas

- Spanish: Native
- English: Intermediate (275 hours of training at the University of Calgary)

Publications and Conferences

35th International Geographical Congress 2024 (August 24-29, 2024)

Presentation: *Accessibility and mobility evaluation in rural areas: A big data approach for analyzing transport spatial inequalities in Castilla-La Mancha, Spain.*

Organizer: Geographical Society of Ireland (GSI), Dublin City University (DCU).

XV CIT 2023 Transportation Engineering Congress (Presenter) (June 15, 2023)

Presentation: *Characterization of territorial structures in rural areas and their influence on transport and mobility services.*

Organizer: Universidad de La Laguna.

UGEO 2023, 9th Edition (Presenter) (September 5, 2023)

Presentation: *Transport operators servicing rural areas: Factors influencing accessibility values for education and health mobility in Castilla-La Mancha (Spain).*

Organizer: University of Barcelona and Institute of Catalan Studies.

XI Doctoral Conference at the University of Castilla-La Mancha (Presenter) (November 24, 2023)

Poster: *Identification of territorial structures in rural areas of Castilla-La Mancha and their effects on mobility patterns for basic services.*

Organizer: University of Castilla-La Mancha.

27th International Conference of Hong Kong Society for Transportation Studies (December 11, 2023)

Co-author of the presentation: *Evaluating spatial inequalities in access to education and health facilities in rural areas: The case of the "Empty Spain".*

Organizer: The Chinese University of Hong Kong.

V Scientific Campus of the Transport Engineering Forum (Presenter) (April 25, 2024)

Presentation: *Accessibility and mobility analysis for identifying spatial-temporal inequities in transportation services in rural areas of Castilla-La Mancha.*

Organizer: Transport Engineering Forum, Cercedilla (Madrid).

X CIOT 2021, 10th International Land Management Congress (Presenter) (2021)

Presentation: *DGIS: Software for urban and interurban transport analysis and design based on accessibility.*

Organizer: Fundicot, Generalitat Valenciana, Spain.

XXV National Congress and XVI International Congress of Civil Engineering - ANEMIC (Attendee) (2016) Colombia.

Asia-Pacific Progress Conference

Pontificia Universidad de Cali, July 2015 (Attendee).

Research and Publications Activity

Characterization of territorial structures in rural areas and their influence on transport and mobility services, EURE Journal, article approved for publication.

Production capacity and sustainability in new businesses, Espacios Journal, Vol. 40 (43).<https://red.uao.edu.co/bitstream/handle/10614/13425/Capacidad%20de%20producci>

%C3%B3n%20y%20sostenibilidad%20en%20empresas%20nuevas.pdf?sequence=3&isAllowed=y

Entrepreneurial keys: A simulator for creating sustainable businesses, Espacios Journal, ISSN 798, 1015.

<https://www.revistaespacios.com/a20v41n19/a20v41n19p15.pdf>

Advanced Break-even Point (Pea): A tool for ensuring business sustainability, Criterio Libre Journal, Vol. 20(37).

<https://revistas.unilibre.edu.co/index.php/criteriolibre/article/view/9571>

Book: *Dynamic Business Model*

April 2020, ISBN 978-958-77193-0-7, ECOE EDICIONES Publishing, Colombia.

Academic Experience

- Design of detached breakwater, beach (Spain) for beach regeneration.
- Design of roll-on/roll-off mooring line in the port of Spain.
- CM-220 audit, Villar del Arcas (Cuenca, Spain).
- Design of a bike lane in the municipality of Mieres, Spain.
- Traffic modeling of a roundabout with PTV Visum.
- Neighborhood design following Spanish urban planning regulations.
- Route analysis from Hong Kong to Cali.
- Strategic environmental assessment in Sueca, Spain.
- Transportation cost model for the Valencia bus route.
- Water supply and sewerage project: Design of a potable water system for a municipality (intake, desander, treatment plant, pipes, distribution network, etc.). Design of a sewer system for the municipality (Colombia).
- Hydraulic canal project: Study, evaluation, and redesign of a canal in the city of Santiago de Cali ("Canal Sur") (Colombia).
- Fluid mechanics project: Design of an alternative water supply system for a single-family house, providing 20% of the water demand for the garden, toilets, etc. (Colombia).
- Structural design: Design of a hospital with a 4-story steel structure.
- Concrete design: Design of a 4-story apartment building using a framed system.