

Fernando Benitez-Paez

The Alan Turing Institute – Research Associate - Spatial modelling

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I am a researcher and consultant in GIScience with a solid knowledge of remote sensing, holding a PhD in Geo-Informatics awarded as outstanding research, with the support of Marie Skłodowska-Curie actions from the European Commission. Currently working as Research Associate at The Alan Turing Institute as part of the AI for science and government (ASG) initiative, particularly working in the Shocks and Resilience to develop spatial modelling methods that can be integrated within the epidemiologic-socio-economic models in order to tackle policy questions that are relevant at the sub-national level. Previously I hold a research fellowship at the University of Jaume I, supported by the Government of Spain and the European Social Fund (ESF). I worked as a postdoctoral researcher at the University of St Andrews in Scotland, supported by a Leverhulme Trust grant, developing a data fusion method to annotate Earth's magnetic field data from satellite and terrestrial sources to GPS trajectories. I have been lecturer in current GIS trends in the *Universidad del Valle* in Cali - Colombia. A former development and business partner manager, and head of geographic innovation team in Esri-Colombia. Holding a bachelor degree in Cadastral and Geodesy engineer I have experience in GIS deployment, spatial analysis, remote sensing, open data, well government, and citizen engagement. Working with several local authorities in multiples countries, especially in South America and Europe. Passionate about GIScience research, machine learning techniques, data fusion methods, 2D/3D visualization tools, spatial analysis. My aim is to help public administrations and private organizations to transform ideas into real solutions through spatial data and remote sensing.

Working Experience

- **The Alan Turing Institute** **London, UK**
Research Associate *April 2021–Currently*
Working in the Shocks and Resilience project to develop spatial modelling methods that can be integrated within the epidemiologic-socio-economic models in order to tackle policy questions that are relevant at the sub-national level
- **The Institute of New Imaging Technologies** **Castellón, Spain**
Postdoctoral researcher *November 2020–April 2021*
Research fellowship, working in the proposal called Deep Urban Mobility, a project to define a machine learning method to characterize the urban mobility patterns in medium-size cities using remote sensing data sources
- **University of St Andrews** **St Andrews, Scotland**
Postdoctoral researcher in Spatial Data Science *September 2019–November 2020*
I worked as spatial data science researcher, specifically, developing a new data fusion method to integrate GPS data and Earth's magnetic field data sources working with Dr Urska Demsar on the project *Uncovering the Mechanisms of Migratory Bird Navigation with Big Data Analytics*.
- **Universidad del Valle** **Cali, Colombia**
Lecturer *June 2014–June 2019*
Teaching courses in topics such as, Current GIS Trends, WebGIS and Native Apps Development Cartography, GIS development, Spatial Analysis.

- **UBIK, Geospatial Solutions**
GIS Coordinator

Responsible for GIS projects. Writing proposals, designing GIS architectures to apply the GIS technologies to local administrations and organizations, around Spain.

Valencia, Spain
September 2015–September 2019
- **University Jaume I, GeoTec Research Group**
Research, PhD Candidate

PhD candidate in the European Joint Degree, [GeoC: Enabling Open Cities](#) with the support of Marie Skłodowska-Curie actions, leading the Esri11 research topic. The research aimed to include a bottom-up approach, considering the potential of open geographic data in cities to develop a generic strategy to help data authorities to re-shape their ongoing open data strategies. Internship with Esri Portugal implementing ArcGIS Online Open Data for small cities and external semester in NOVA-IMS University in Lisbon-Portugal, multiples collaborations with professors in Leeds University-UK and Munster University-Germany.

Valencia, Spain
September 2015–November 2018
- **Esri Colombia**
Developer and Business Partners Manager

Empowering developers, students, entrepreneurs and GIS lovers to use the ArcGIS technology. Head of geographic innovation team called "Semillero de Innovación geográfica", leading over 12 developers to deploy innovated GIS apps, applying the latest Esri's SDK and APIs. At the same my role as Business Partners manager was guiding Esri business partners to define the market business and transform their current business model towards an updated ArcGIS-based model. Data and Content curator for Colombia. Certificated Esri Instructor.

Bogotá, Colombia
March 2013–September 2015
- **CIAF-IGAC**
Assistant Professor

As an assistant professor, I taught in topics such as Web GIS and Native Apps Development Spatial Databases and Introduction to Web GIS

Bogotá, Colombia
2015
- **Universidad de Manizales**
Assistant Professor

As an assistant professor, I taught in subjects like Web GIS, Cloud GIS, and Development of Web and Native GIS applications.

Manizales, Colombia
2015
- **Universidad Distrital**
Assistant Professor

As an assistant professor, I taught in topics such as Web GIS and Native Apps Development Cartography, GIS development, spatial analysis and GeoDatabases.

Bogotá, Colombia
January 2013–January 2014
- **Procalculo-Prosís (later on Esri Colombia)**
Technical support engineer; Certificated Instructor; GIS Architecture

Technical support engineer. Advice on marketing projects and campaigns of ESRI products and ENVI. Provide support services and software deployment and configuration, troubleshooting, performance to internal and external users of ESRI and ENVI products among several public administrations in Colombia. Professional services and training of ESRI and ENVI products.

Bogotá, Colombia
October 2008–March 2013
- **Corporación Colombia Digital**
Constant/Adviser

Consultancy to support digital creativity workshops. Development of digital learning resources. Support and Assessment of technical and learning operators of ETB (Bogotá Telco Company) interactive portals.

Bogotá, Colombia
August 2008–October 2008

Education

Academic Qualifications

- **PhD in Geoinformatics** **Spain-Portugal-Germany**
European Joint Doctorate (EJD), University of Jaume I, Castellon, Spain 2015–2018
- **Cadastral and Geodesy Engineer** **Bogotá - Colombia**
Bachelor degree, University Francisco Jose de Caldas 2004–2009

Academic Experience

Articles

- **Fusion of wildlife tracking and satellite geomagnetic data for the study of animal migration** **Movement Ecology**
F Benítez-Paez, V Brum Bastos, C Beggan, JA Long, U Demšar Published: 11 June 2021
<https://doi.org/10.1186/s40462-021-00268-4>
- **Establishing the integrated science of movement: bringing together concepts and methods from animal and human movement analysis** **IJGIS**
U Demšar, JA Long, F Benítez-Paez, V Brum Bastos, S Marion, S Sekulić, K Smolak, B Zein and K Siła-Nowicka Published, 19 Feb 2021
<https://doi.org/10.1080/13658816.2021.1880589>
- **Creating a conceptual framework to improve the re-usability of open geographic data in cities** **Transactions in GIS**
F Benítez-Paez, A Comber, S Trilles, J Huerta Published: 02 August 2018
<https://doi.org/10.1111/tgis.12449>
- **Roadblocks Hindering the Reuse of Open Geodata in Colombia and Spain: A Data User's Perspective** **ISPRS Int. J. Geo-Inf.**
F Benítez-Paez, A Degbelo, S Trilles, J Huerta Published: 27 December 2017
<https://doi.org/10.3390/ijgi7010006>
- **Situation Goodness Method for Weighted Centroid-Based Wi-Fi APs Localization** **Geoinformation and Cartography**
G.M Mendoza-Silva, J Torres-Sospedra, J Huerta, R Montoliu, F Benítez-Paez, O Belmonte. Published: 13 October 2016
https://doi.org/10.1007/978-3-319-47289-8_2

In preparation or under revision

- **Modelling geomagnetic navigation strategies during long-distance bird migration using GPS and real-time geomagnetic data** **Movement Ecology**
Zein B, Benítez Paez F, Long JA, Safi K, Koelzsch A, Wikelski M and Demsar U In preparation

Books Chapters

- **Openness: A Key Factor for Smart Cities** **Handbook of Smart Cities**
Özdal Oktay S., Oliver S.T., Acedo A., Benítez-Paez F., Gupta S., Kray C. 08 January 2021
https://doi.org/10.1007/978-3-030-15145-4_69-1

International Conferences Papers

- **Creating a conceptual framework to improve the re-usability of open geographic data in cities** **Esri Science Symposium**
F Benítez-Paez, A Comber, S Trilles, J Huerta San Diego, July 2018

- City data 3.0 - A generic initiative to promote and assess the reuse of geographic information in cities - early steps**
F Benitez-Paez, S Trilles, J Huerta
ISBN: 978-989-8533-67-8

IADIS International Conference
Lisbon, July 2017
- Conference Poster, City data 3.0 - A generic initiative to promote and assess the reuse of geographic information in cities**
F Benitez-Paez, J Huerta
<https://agile-online.org/index.php/conference/proceedings/proceedings-2017>

AGILE Conference
Wageningen, May 2017
- Ensembles of indoor positioning systems based on fingerprinting: Simplifying parameter selection and obtaining robust systems**
J. Torres-Sospedra, G. M. Mendoza-Silva, R. Montoliu, O. Belmonte, F. Benitez-Paez and J. Huerta
doi: 10.1109/IPIN.2016.7743679.

IPIN Conference
Alcala de Henares, 2016

Workshop publications and chaired sessions.....

- **Joint Proceedings of the 5th Open Data for Open Cities Workshop on Re-use and discovery level, applied to the spatial point analysis process on linear networks:**
Fernando Benitez, Mohammad Medhi Moradi, Diego Pajarito(eds.). International Workshop co-located with the 20th International Conference (AGILE 2017), Wageningen, The Netherlands, May 09, 2017.
<http://ceur-ws.org/Vol-1952/>, urn:nbn:de:0074-1952-9.
- **2nd edition of Open Data for Open Cities, the reuse of open data through spatial analysis:**
Fernando Benitez (UJI), Adeoluwa Akande (NOVA University) (eds.) International Workshop co-located with the 21th International Conference (AGILE 2018), Lund, Sweden, June 12, 2018.
<http://opendata4opencities.uji.es/>

Fellowships and awards

- 2020 – Postdoctoral Research Fellowship, APOSTD2020: September 2020 - August 2022.
The Fellowship is a national competitive grant awarded to researchers in a Spanish research institute. Funded by the Regional Government of Valencia - Spain and the European Social Fund (ESF). The grant consist of direct research costs and living expenses worth €92.970. Under the supervision of Professor Joaquin Huerta in the GeoTec research group at Jaume I University. The project awarded was a Deep Urban Mobility, a research project to define a machine learning method using remote sensing to characterize the urban mobility patterns in medium-size cities. [Official fellowship grant description](#) - [List of research fellows](#).
- 2020 – Scottish Alliance for Geoscience, Environment & Society (SAGES) 6th call Small Grants Scheme (SSGS) for GIScience conference 2021.
- 2019 – European Cooperation in Science & Technology - COST Actions for small grant to attend the 6th Workshop about City + Citizen Science.
- Best conference poster presenting *City Data 3.0 – A generic initiative to promote and assess the reuse of geographic information in cities – Early steps*" at [20th AGILE International Conference on Geographic Information Science](#), 2017, Wageningen, the Netherlands.

Academic community service

Special Issues

- **Open Data for Open Cites (OD4OC): Reuse of Open Data through Spatial Analysis, for MDPI Information Journal** Fernando Benitez, Adeoluwa Akande, Marco Painho, Joaquín Huerta, Pedro Cabral, Michael Gould (Guest editors). A special issue of Information (ISSN 2078-2489). This special issue belongs to the section "Information and Communications Technology".
https://www.mdpi.com/journal/information/special_issues/Open_Data_2018

Chaired sessions

- **Chair in the Data mining and clinical studies session:** at the 10th international conference ICT, Society, and Human Beings, 2017. Held in Lisbon, Portugal, July 20-22, 2017.

Reviewing

- IJSDIR- International Journal of Spatial Data Infrastructures Research
- ISPRS International Journal of Geo-Information
- Computers, Environment and Urban Systems
- Remote Sensing in MDPI

Teaching

Courses

- **University of St Andrews** **St Andrews, UK**
Online course about spatial analysis, Web and Cloud GIS, PhD courses 2020
- **Universidad del Valle** **Cali, Colombia**
Lecturing in GIS Trends, MSc students 2015
- **CIAF-IGAC** **Bogotá, Colombia**
Lecturing in topics such as Web GIS and Native Apps Development
Spatial Databases and Introduction to Web GIS, MSc students 2015
- **Universidad de Manizales** **Manizales, Colombia**
Lecturing about Cloud GIS, and Development
of Web and Native GIS applications, MSc students 2015
- **Universidad Distrital** **Bogotá, Colombia**
Lecturing in topics like Cartography, GIS, spatial analysis
and GeoDatabases, MSc students 2014

Co-supervision

- Alaa Abdelfattah.(2019)."Increasing citizen and association involvement in government decision-making by implementing civic engagement platforms: Valencia City case study", MSc in Geospatial Technologies, Castellón, Spain.
- David Julián Pardo Corzo.(2017)."Investigating applied spatial services on mobile technologies for the current challenges of university campuses.", MSc in Geospatial Technologies, Castellón, Spain.
- Wilmer Muñoz, Rodrigo Leal.(2016)."Desarrollo del Geoportal de la Universidad del Valle Sede Meléndez Disponible en Aplicativos Moviles", Bachelor Student, Valle University, Cali, Colombia.

Collaborations

Summer Schools Attendance.....

- [GEOSTAT Split 2017 Summer School](#), Split, Croatia. (2017): GEOSTAT aims at PhD students and researchers in a range of environmental and GIS sciences, especially those focusing on analysing spatial and spatio-temporal gridded data in R and OS GIS. The main idea of GEOSTAT is to promote various aspects of statistical analysis of spatial and spatio-temporal data using Open Source/free GIS languages and tools: R, Python, GRASS GIS, QGIS, SAGA GIS and similar.
- [Vespucci Initiative 2016](#). Sensors, Smart Cities, Open Data and Mobility. Benicassim, Spain: The Vespucci Initiative recaptures his spirit of multi-disciplinary intellectual inquiry to explore new frontiers of knowledge and new territories. To that end since 2003 it has organized a range of research and teaching activities, bringing together senior scientists and promising young researchers from various fields and from around the world.

Research stays/visits.....

- [The 4th AGILE PhD school](#), Professor [Lex Comber](#), 2017 - Leeds, United Kingdom.
- [Professor Roberto Henriques](#), NOVA IMS University, Lisbon, Portugal. February 2017.

GIScience Contributions.....

- External supervisor. [EO4GEO](#) is an Erasmus+ Sector Skills Alliance project gathering 26 partners from 13 countries from academia, private and public sector active in the education/training and space/geospatial sectors.
- Sub-task Coordinator. [IDEais](#): Asistentes Inteligentes para las Infraestructuras de Datos Espaciales (IDE)

Collaborations with Public Authorities and Organizations.....

- National University of Colombia, Colombia -
Definition and design of GIScience and Remote Sensing laboratory - [GeoScience Lab](#)
- Generalitat Valenciana - Regional Government of Valencian Community, Spain -
[Data Science for COVID-19 crisis](#) in the Valencian community, using ArcGIS Platform - [#YoMeQuedoEnCasa](#)
- Valencia City Hall, Transparency and Well-Governance, Spain - [Civic Data Gov](#)
- IDECA, Local SDI of Bogota City Hall, Bogota, Colombia
- Medellin City Hall, Open Data Initiative, Medellin, Colombia
- IDESC, Local SDI of Cali, Cali, Colombia
- Esri Portugal, Open Data portal for Amadora City, Lisbon, Portugal
- Porto City hall, Improving the impact of open data, Porto, Portugal

Notable Projects

- **Civic Data Gov Applications** To help the transparency and well governance office in the Valencia city hall, Spain. I wrote the book "Identification and characterization of geographical initiatives that support the generation of data collected by citizens." I lead the deploy and design of several map-based web apps to help Valencian citizen to take informative decisions during the current COVID-19 crisis. - [Civic Data Gov](#)
- **Deep Urban Mobility** With the support of the Regional Government of Valencia - Spain and the European Social Fund (ESF). This research projects aims to define a machine learning method using remote sensing to characterize the urban mobility patterns in medium-size cities. Grand reference APOSTD/2020/016. Funding period 1 Sep 2020 to 30 Sep 2022.
- **Uncovering the Mechanisms of Migratory Bird Navigation with Big Data Analytics**

With the support of Leverhulme Trust Foundation, and an external visit to Max Planck Institute for Ornithology, this project has the following objectives. A data fusion method that integrates GPS data (animal trajectories) and satellite and terrestrial observatories data sources. Integrate an [ENV-Data system](#) with the geomagnetic data. Env-Data is an open repository of tracking birds' projects. Integrate geomagnetic data to this tool would help users from this system and other areas to get different insights about the impact of the earth's magnetic field and its variations. Principal Investigator Dr Urska Demsar - University of St Andrews. Co-Investigators Dr Jed Long - Western University, Dr Kamran Safi and Prof Martin Wikelski - both Max Planck Institute for Animal Behaviour. Project supported by the Leverhulme Trust, grant number [Research Project Grant RPG-2018-258]. Funding period 1 Oct 2018 - 31 Dec 2021.

- **European Project Geo-C: Enabling Open Cities**

Fellow candidate, leading the Esri research topic about Multi-scale, multidimensional urban information integration matching and visualization. Titled: A user-centric framework to improve the reusability of open geodata in cities, awarded as outstanding research. Main supervisor, [Dr Joaquin Huerta - University Jaume I](#), and external supervisors [Dr Christian Kray - University of Münster](#) and [Dr Roberto Henriques - University NOVA-IMS](#). Project funded by the European Commission within the [Marie Skłodowska-Curie actions](#), through an International Training Networks (ITN). The funding period is January 1, 2015 - December 31, 2018, Grant Agreement number 642332 — GEO-C — H2020-MSCA-ITN-2014. <http://dx.doi.org/10.6035/14123.2018.594928>

- **Geographic Innovation Team**

During my job in Esri Colombia, I managed the budget and people from GIS services sector, performing GIS projects, in several Colombian public and private organizations developing web and mobile applications. Over two years the [innovation team](#) was created using bachelor students with GIScience skills, designers and developers to set up small groups that help Esri to deploy new, innovated and out of the box applications showing the potential of Esri's developer platform.

Technical and Project Management Skills

- **Languages:** Spanish (Mother Tongue), English (Fluent), Portuguese and French (Basics).
- **Programming Languages:** Proficient in: Python, R, JavaScript, HTML, CSS, XML, C#, LaTeX.
- **Industry Software Skills:** (Advanced) GIS Platforms such as ArcGIS Pro, ArcGIS10x (Desktop, Enterprise, mobile and online), (Advanced) ILWIS, QGIS, GRASS, remote sensing and processing satellite images, ENVI 4.x, ArcGIS Server Image extension, creating appropriate mapping, analysis spatial process. (Intermediate) Visio, Enterprise Architect, design databases in different RDBMS like (Intermediate) Mongo, Oracle, SQL Server, Postgres, and post-processing GPS data.
- **General Business Skills:** Scrum and Agile Methodologies, Project Management, Good presentation skills, Works well in a team, academic background, experience in several countries regarding GIScience.
- **Other:** System design for GIS Architectures and developing proposals, Good writing skills I can write well organised and structured reports. Developing marketing campaigns, and solid structure for a new geographic-based opportunities and business models.

References

- Senior Lecturer [Dr Urška Demšar](#), Co-director of the [Bell Edwards Geographic Data Institute](#) & Associate Editor of the [International Journal of Geographical Information Science](#)., University of St Andrews, Scotland, UK. **E-mail:** urska.demsar@st-andrews.ac.uk
- Senior Lecturer [Dr Katherine Lisa Keenan](#), Lecturer in Demography/Population Geography, University of St Andrews, Scotland, UK. **E-mail:** Katherine.Keenan@st-andrews.ac.uk
- Professor [Michael Gould](#), Global Education Manager At [Esri](#), Redlands, USA. **E-mail:** MGould@esri.com

- Professor [Christian Kray](#), [Institute for Geoinformatics \(ifgi\)](#) at the [University of Münster](#), Münster, Germany. **E-mail:** [c.kray \[at\] uni-muenster.de](mailto:c.kray[at]uni-muenster.de)
- Post-Doctoral Researcher [Auriol Degbelo](#), [Institute for Geoinformatics \(ifgi\)](#) at the [University of Münster](#), Münster, Germany. **E-mail:** auriol.degbelo@uni-osnabrueck.de
- Marta Ines Cifuentes, Marketing Manager at [Esri Colombia](#), Bogotá, Colombia. **E-mail:** mcifuentes@esri.co
- [Raúl Jiménez Ortega](#), Head of Startups and Spin-off program at [Esri Spain](#), Madrid, Spain. **E-mail:** raul.jimenez@esri.es
- Daniela Wingert, Head of Sales Education and Science at [Esri Deutschland GmbH](#), Berlin, Germany. **E-mail:** d.wingert@esri.de