

Juan M. Escamilla Molgora, PhD

Statistical Ecologist and Geospatial Data Scientist

Research Interests

- Spatio-temporal modelling of species distributions and other biodiversity measures
- Geospatial computational systems for access, homogenisation, analysis and interactive visualisations of large environmental and ecological data.
- Spatial Bayesian-based Statistics

Education

- 2021 **PhD**, *Environmental Science, Statistics and Data Science*, Thesis: Statistical modelling of species distributions using presence-only data: A semantic and graphical approach using the tree of life, Supervisors: Professor Peter Atkinson, Dr. Luigi Sedda and Professor Peter Diggle
Lancaster Environmental Centre; Centre for Health, Informatics, Computing and Statistics (CHICAS) and Data Science Institute, Lancaster University, UK
- 2015 **M.Sc.**, *Geo-information Science and Earth Observation for Environmental Modelling*, Dissertation: *A Taxonomic-Based Spatio-Temporal data structure for modelling biodiversity networks, Erasmus-Mundus program (year 2)*
Department of Geography and Environment, University of Southampton, UK
- 2014 **M.Sc.**, *Geo-information Science and Earth Observation for Environmental Modelling*, Courses: Advanced GIS, Environmental Remote Sensing, Algorithms in GIS, Ecosystem Modelling and Hydrologic Modelling, *Erasmus-Mundus program (year 1)*
Department of Physical Geography and Ecosystem Science, Lund University, Sweden
- 2012 **B.Sc.**, *Mathematics*, Faculty of Sciences, National Autonomous University of Mexico (UNAM), Mexico
- 2011 **B.Sc.**, *Biology*, Faculty of Sciences, National Autonomous University of Mexico (UNAM), Mexico

Employment

- 2023 - **Software Engineer**, *Development of a centralised platform for analysis and survey design for neglected tropical diseases*, World Health Organisation (WHO), Centre for Health Informatics Computing and Statistics (CHICAS)
Lancaster University
- 2020 - 2023 **Research Associate**, *Statistical models for joint species distributions*, Lancaster Environment Center, Faculty of Science and Technology
Lancaster University, UK

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- 2015 **Data Scientist**, Role of Biodiversity on Climate Change Mitigation (*ROBIN*), Modeller and data analyst for determining efficiency frontiers in Ecosystem Services for Mexico and Brazil, P.I.: Patricia Balvanera | Instituto de Investigaciones en Ecosistemas - UNAM Mexico
- 2011 - 2014 **Remote sensing and Geospatial application and system developer**, *National Commission for Knowledge and Use of Biodiversity (CONABIO)*, Mexico
- Principal developer of the National Wildfire Alert and Monitoring System.
 - A real-time and historic monitoring service for wildfires in Mexico and Central America ([*click to visit web-page*])
 - System administrator of the computer infrastructure for MODIS and VIIRS direct-readout *in-situ* station. First data receiving infrastructure for VIIRS (SUOMI-NPP satellite) in Latin America.
 - Maintenance and Monitoring of the receiving antenna and processing chain.
- 2008 - 2009 **Scientific-visualization programmer**, *General Direction of Academic Computing*, UNAM, Mexico City
- Academic support for visualization of datasets acquired from diverse research projects at UNAM. Ranging from pure and applied mathematics to biomedical, biomechanics and social sciences.

Relevant peer-reviewed publications

- 2022 **Escamilla-Molggora, J., Sedda, L., Diggle P., Atkinson P.**, *A joint distribution framework to improve presence-only species distribution models by exploiting opportunistic surveys*, Journal of Biogeography, 49:1176–1192.
DOI:10.1111/jbi.14365
- 2022 **Escamilla-Molggora, J., Sedda, L., Diggle, P., Atkinson P.**, *A taxonomic based joint species distribution model for presence-only data*, J. R. Soc. Interface, 19: 20210681
DOI:10.1098/rsif.2021.0681
- 2020 **Escamilla-Molggora, J., Sedda, L., Atkinson, P.**, *Biospytial: Spatial graph-based computing for integrating ecological and environmental data.*, GigaScience, Volume 9, Issue 5, May 2020, giaa039
DOI:10.1093/gigascience/giaa039

Awards and Scholarships

- 2016 **GBIF Young Researchers' Award**, *Global Biodiversity Information Facility*, Project: A network-based geostatistical approach for reconstructing local ecological communities
- 2015 **PhD Scholarship, Tuition fees and living allowance**, Funding body: National Council for Science and Technology, CONACYT - Mexico
- 2013 **MSc. Scholarship, Tuition fees and living allowance**, Funding body: National Council for Science and Technology, CONACYT - Mexico
- 2008 **Award for BSc., Fellows plan in high performance computing**, Scientific visualisation, General Direction of Academic Computing Services (DGSCA)
UNAM

Teaching experience

- 2017 - 2020 **Assistant Lecturer, (Demonstrator) Biodiversity and Conservation [LEC.145]**, Undergraduate Course for Biology and Environmental Science, Lancaster Environmental Center Lancaster University

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2010 - 2011 **Assistant Lecturer**, UNAM, Faculty of Sciences, Mexico City,
Applied Mathematics Seminar I
Topic: *Natural and Artificial Neural Networks.*

Participation in conferences

- 2020 **GEOBON Open Science conference**, *Biospatial: Graph-based computing for ecological big data*, Session: BON Development, Flash talk
- 2017 **Spatial Statistics Conference**, *Introducing Biospatial An Open Source graph-based computing framework for managing and modelling spatial ecological data*, Lancaster University
- 2013 **CSPP/IMAPP Users' Group Meeting**, *University of Wisconsin-Madison, Space Science and Engineering Center (SSEC)*, Using VIIRS Direct Readout Capabilities for the Improvement of Mexico's Wild Fire Alert System, May, 2013
- 2012 **3rd International Conference on Computing for Geospatial**, *Washington DC, National Fire Alert and Monitoring System*, July, 2012
- 2012 **5th Workshop on Solutions to Industrial Problems. Center for Research in Mathematics (CIMAT)**, *Guanajuato, Mexico, Adaptive regression and normalization algorithms for downscaling MODIS images*, January, 2012

Attended summer schools

- 2018 **Summer School in Computational Statistics**, *LMS Invited Lecture Series*, July, 2018, Warwick, UK
- 2018 **AI Summer School 2018**, *Microsoft Research*, Cambridge, UK, July, 2018
- 2017 **iDiv Summer School 2017**, *Synthesising and modelling biodiversity data*, German Centre for Integrative Biodiversity Research (iDiv) Halle-Jena-Leipzig, September 2017

Software

Geospatial Applications and services:	GRASS, QGIS, Geoserver, PostGIS, ESRI	Geospatial programming libraries:	GDAL, OpenLayers, GeoPandas, Shapely, Rasterio
Web-based front-end tools	Rest-full API dev. HTML, CSS3, Jquery, OpenLayers	Web-service providers and standards	Django, W*S, TMS, Apache, Tomcat
Cloud technologies	Docker Suite (Swarm mode)	Versioning Systems	Git, Gitlab, SVN
Programming Languages	Python, R, Bash, Javascript, Perl, SQL, C++, Fortran, PHP	Scientific computing packages	STAN, PyMC3, Scipy, Octave, Matlab
Operating Systems	Linux (System administration), OSX, Windows	Database Management Systems:	Postgres, MySQL, Neo4J, Redis

Other publications

- Article **In preparation**, *Golivets, M., Escamilla-Molggora, J., González-Trujillo, J.D., Pasion, B.O., Ulrich, J., Petsch, D.K., Craven, D.*, A quantitative comparison of approaches to data synthesis in ecology: meta-analysis and distributed studies.

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- Peer-reviewed article (2018) **Dettori, S., Filigheddu, M.R., Deplano, G., Escamilla-Molggora, J., Ruiu, M., Sedda, L.**, Employing a spatio-temporal contingency table for the analysis of cork oak cover change in the Sa Serra region of Sardinia, Nat. Sci. Reports, DOI:10.1038/s41598-018-35319-1
 (2018) 8:16946
- Book **2012**, Escamilla-Molggora, J., Introducción a los Sistemas de Información Geográfica de Código Abierto
[click to preview](#)
- Conference paper **2011**, Campos, T., Escamilla-Molggora, J., Garay, J., Lobato, J., Mireles, J., Padilla, P., Paz, I., Rojas, D.J., Sanchez, F., Computers with personality: a mathematical approach to musical style in improvisation, Memorias de la Sociedad Matemática Mexicana Issue: Memoirs of the Fourth International Seminar on Mathematical Music Theory. Serie: Memorias. Vol. 4.(2011): 49-61
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Extracurricular activities

- 2010-2012 **SEMIMUTICAS**, Seminar on Music and Mathematics (web-page), IIMAS-UNAM, Conferences, Instalations, and multimedia workshops
- 2007-2011 **Cineclub Ciencias**, Faculty of Sciences, UNAM, Projections of films, debates, annual 24hr marathon festival, among other activities
- 2006–2008 **Public engagement**, Workshops in local communities in the mesophyll (tropical) rainforest of Cuetzalan, Puebla.. Organic crops, food sovereignty, greenhouse management, vermicompost, ethnobotanic repositories. Help in the construction of efficient clay stoves, and biodigestors., Faculty of Sciences, UNAM
 Puebla, MX
- 2004 **Certified Scuba Diver**, FMAS-CMAS, Two stars

Languages

Spanish	Mother tongue	
English	C2	95 pts. IB-TOEFL (2013)
Italian	C1	Language efficiency
German	A2	

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