

Rafael Prieto-Curiel | Curriculum

 www.rafaelprietocuriel.com

Education

University College London

Doctorate degree in Applied Mathematics

2014–2018

Mathematical models of social issues such as migration, crime, fear and road accidents

University College London

Masters in Statistics

2013–2014

Spatial statistics, simulation

Instituto Tecnológico Autónomo de México (ITAM)

Degree in Applied Mathematics

2004–2009

Experience

Vocational.....

Complexity Science Hub

Vienna

Postdoctoral Fellow

2022-current

Modelling mobility, transport, migration, conflict and complex social systems

Organisation for Economic Co-operation and Development (OECD)

Paris

Consultant

2015-current

Consultant for the Sahel and West Africa Club (SWAC). Spatial interaction models, food economy, migration, science of cities, data and big data.

Aleph

Mexico City

Scientific advisor

2018-current

Scientific advisor for crime, and mobility data.

University of Oxford / EAFIT / UCL

Oxford / Medellín / London

Postdoctoral Research Assistant

2018-2021

PEAK Urban at the Mathematical Institute and the Centre for Advanced Spatial Analysis - Complex systems and data modelling for urban development

Emergency Attention Centre

Mexico City

Director in Strategic Analysis

2010-2013

(Centro de Atención a Emergencias y Protección Ciudadana de la Ciudad de México) Crime prediction models. Policing and police strategy design. Police allocation and resources optimisation. Evaluation models and systems.

Consultoría Passel

Mexico City

Executive Consultant

2009

Finance analysis. Image analysis.

Science Communication.....

Punto Decimal Mx - General science communication media outlet

London

Founder and Editorial Director

2016-current

On-line science communication website. Available on-line www.puntodecimal.mx/

Chalkdust – Mathematics magazine

London

Founder and Editorial Director

2015-2018

Six editions published with 18,700 copies printed. Available on-line www.chalkdustmagazine.com.

Laberintos e Infinitos – Mathematics magazine

Mexico City

Editorial Director

2008-2009

Four editions published with 10,000 copies printed. Available on-line www.laberintos.itam.mx.

Publications

Vocational.....

- Prieto-Curiel, R., Patino, J. E., & Anderson, B. (2023). Scaling of the morphology of African cities. *Proceedings of the National Academy of Sciences*, 120(9)
- Prieto-Curiel, R., & Kondor, D. (2023). Arguments for building The Circle and not The Line in Saudi Arabia. *npj Urban Sustainability*, 3(1), 35.
- Walther, O. J., Prieto-Curiel, R., Padron, J., & Scheuer, J. (2023). Mapping the Travel Geography of the 9/11 Network. *The Professional Geographer*, 1-15.
- Prieto-Curiel, R., and Ospina, J.P. (2023). Large cities are less efficient for sustainable transport: The ABC of mobility. *arXiv:2212.13956*.
- Prieto-Curiel, R., Heo, I., Schumann, A., & Heinrigs, P. (2022). Constructing a simplified interurban road network based on crowdsourced geodata. *MethodsX*, 9, 101845.
- Prieto-Curiel, R., Schumann, A., Heo, I. & Heinrigs, P. (2022). Detecting cities with high intermediacy in the African urban network. *Computers, Environment and Urban Systems*.
- Anderson, B., Patiño, J. E. P., & Prieto-Curiel, R. (2022). Boosting African cities' resilience to climate change: The role of green spaces. *West African Papers*, No. 38, OECD Publishing, Paris
- Prieto-Curiel, R., González Ramírez, H., & Bishop, S. (2022). A Ubiquitous Collective Tragedy in Transport. *Frontiers in Physics*.
- Prieto-Curiel, R., Cabrera-Arnau, C. & Bishop, S. (2022). Scaling beyond cities. *Frontiers In Physics*.
- Prieto-Curiel, R., Quiñones Domínguez, M., Lora E. & O'Clery, N. (2022). Mobility between Colombian cities is predominantly repeat and return migration. *Computers, Environment and Urban Systems*.
- Hong, A., Baker, L., Prieto-Curiel, R., Duminy, J., Buswala, B., Guan, C. & Ravindranath, D. (2022). Reconciling big data and thick data to advance the new urban science and smart city governance. *Journal of Urban Affairs*.
- Prieto-Curiel, R. (2021). Weekly Crime Concentration. *Journal of Quantitative Criminology*, 1-28.
- Prieto-Curiel, R., González Ramírez, H., Quiñones Domínguez, M., & Orjuela Mendoza, J. P. (2021). A paradox of traffic and extra cars in a city as a collective behaviour. *Royal Society Open Science*, 8(6), 201808.
- Prieto-Curiel, R., Opinion Dynamics and the Inevitability of a Polarised and Homophilic Society. In *Theory of Complexity-Definitions, Models, and Applications*. IntechOpen (2021).
- Prieto-Curiel, R., & González Ramírez, H. (2021). Vaccination strategies against COVID-19 and the diffusion of anti-vaccination views. *Scientific Reports*, 11.
- Prieto-Curiel, R., Patino, J. E., Duque, J. C., & O'Clery, N. (2021). The heartbeat of the city. *Plos One*
- Prieto-Curiel, R., Walther, O., & O'Clery, N. (2020). Uncovering the internal structure of Boko Haram through its mobility patterns. *Applied Network Science*.
- Prieto-Curiel, R., Cresci, S., Muntean, C. I., & Bishop, S. (2020). Crime and its fear in social media. *Palgrave Communications*
- Cabrera-Arnau, C., Prieto-Curiel, R., & Bishop, S. (2020). Uncovering the behaviour of road accidents in urban areas. *Royal Society Open Science*.
- Prieto-Curiel, R., Cabrera Arnau, C., Torres Pinedo, M., González Ramírez, H. & Bishop, S. (2019). A continuous binning for discrete, sparse and concentrated observations. *MethodsX*.
- O'Clery, N., Prieto-Curiel, R. & Lora, E. (2019). Commuting times and the mobilisation of skills in emergent cities. *Applied Network Science*.
- Prieto-Curiel, R., Cabrera Arnau, C., Torres Pinedo, M., González Ramírez, H. & Bishop, S. (2019). Temporal and spatial analysis of the media spotlight. *Computers, Environment and Urban Systems*.

- Prieto-Curiel, R., González Ramírez, H. & Bishop, S. (2018). How random is the location of a road accident?, Plos One
- Prieto-Curiel, R., Pappalardo, L., Gabrielli, L. & Bishop, S. (2018) Gravity and scaling laws of city to city migration, Plos One
- Prieto-Curiel, R. & Bishop, S. (2018), Fear of crime: the impact of different distributions of victimisation, Palgrave Communications
- Prieto-Curiel, R. & Bishop, S. (2017), Modelling the fear of crime, Proceedings of the Royal Society A 473 (2203), 20170156
- Farnham, A. and others (2017). Early career researchers want Open Science. Genome biology, 18(1), 1-4.
- Prieto-Curiel, R., Collignon Delmar, S. & Bishop, S. (2017), Measuring the Distribution of Crime and Its Concentration, Journal of Quantitative Criminology, 1-29
- Prieto-Curiel, R., Heinrigs P. & Heo I. (2017), Cities and Spatial Interactions in West Africa, West African Papers, No. 5, OECD Publishing, Paris
- Prieto-Curiel, R. & Bishop, S. (2016), A metric of the difference between perception of security and victimisation rates, Crime Science, 5(1)
- Prieto-Curiel, R. & Bishop, S. (2016), A measure of the concentration of rare events, Scientific Reports, 6
- Prieto-Curiel, R. & Wilmer, S. (2016), *Muchas emergencias y aún más llamadas* Too many emergencies and even more emergency calls, Miscelánea Matemática, 59
- Prieto-Curiel, R., Wilmer, S., Iniguez S. & Escalante M. (2013), *Análisis Criminal y el uso de cámaras de seguridad en la Ciudad de México* Crime Analysis and the usage of security cameras in Mexico City. Chapter in the book *Buenas Prácticas para el Análisis Delictual en América Latina* Good practices on crime analysis in Latinamerica, published in Santiago, Chile.
- Prieto-Curiel, R. (2010), *El seno y coseno de una matriz*. Matrix sine and cosine, Miscelánea Matemática, 46

Communication.....

- De cuando la televisión se humanizó (When the TV became humanized) Letras Libres, 2021
- Vacunación sin rumbo (Aimlessly vaccination) Reforma, 2021
- Vacunación: tres alertas (Three warnings about the vaccination) Reforma, 2021
- Los retos de la vacuna en México (Challenges concerning the vaccination strategy in Mexico) Reforma, 2021
- La loca resistencia a las vacunas (Why are so many people against vaccination?) Nexos Magazine, 2020
- Why we're adding Black Mathematician Month to our calendars, The Guardian, 2 October 2017
- In Conversation with Andrea Bertozzi, Chalkdust, 4, Autumn 2016
- Fractional Calculus: The Calculus of Witchcraft and Wizardry, Chalkdust, 3, Spring 2016
- ¿Por qué los delitos siempre ocurren en el mismo lugar? (Why does crime always occur in the same places?) Nexos Magazine, 2015
- In Conversation with Artur Avila, Chalkdust, 2, Autumn 2015
- Music Playlists, Facebook and Twitter, Chalkdust, 1, Spring 2015
- En redes te enredas (You got entangled in a net), Laberintos e Infinitos, 33, Autumn 2013
- Lorenz, Gini y muchos delitos (Lorenz, Gini and a lot of crimes), Laberintos e Infinitos, 28, Spring 2012
- Si te quieres volver millonario (If you want to become a millionaire), Laberintos e Infinitos, 25, Spring 2011
- Más spots, ¡menos votos! (More Spots, ¡Less Votes!, collaboration) Nexos Magazine, 380, Summer 2009

- La Ciencia detrás de un balón (The Science Behind a Ball), in collaboration with Prof Claudia Gómez Wulschner, Laberintos e Infinitos, 18, Summer 2009
- El Calendario, algo no tan uniforme ni tan universal (Calendar, Neither so Uniform nor so Universal), Laberintos e Infinitos, 15, Summer 2008
- La cuadratura del círculo (Squaring the Circle), Laberintos e Infinitos, 14, Spring 2008
- Límites geométricos (Geometric Limits), Laberintos e Infinitos, 14, Spring 2008

Others.....

- Scaling of City to City Migration, Commuting Flows and Mobility. MSc thesis co-supervisor (UCL), Qia Chen, Summer 2013
- Medidas de eficiencia y heurísticas de mejora de distribución de recursos (Measuring resources distribution and improving heuristics). BSc thesis supervisor (ITAM), Carlos Castro Correa, Summer 2013

Awards

- Best Contribution (2023) - Conference on Complex Networks (CompleNet)
- Provost's Awards for Public Engagement (2017) - University College London student award nominee (UCL)
- Andrew Rosen Prize - excellence in Applied Mathematics (2016), University College London, Mathematics Department (UCL)
- Certificate with Distinction in MSc in Statistics (2014), University College London, Statistics Department (UCL)
- Certificate with Distinction in Applied Mathematics (2009), Instituto Tecnológico Autónomo de México (ITAM)
- First Place in the Research Award Ex-Itam (2009), Instituto Tecnológico Autónomo de México (ITAM)
- Honoric Mention in the Sotero Prieto Prize (2009), Sociedad Matemática Mexicana (SMM)
- First Place in the Competition "Academia – AMAI" (2008), Asociación Mexicana de Agencias de Investigación de Mercados (AMAI)

Scholarships.....

- Abbott (Corte) Studentship (2017), University College London, Mathematics Department (UCL)
- Mayer de Rothschild Scholarship (2017), University College London, Mathematics Department (UCL)
- Edwin Power Scholarship (2017), University College London, Mathematics Department (UCL)
- SoBigData Research Scholarship (2017), Consiglio Nazionale delle Ricerche (CNR)
- Lighthill Scholarship (2016), University College London, Mathematics Department (UCL)
- JJ Silvester Scholarship (2016), University College London, Mathematics Department (UCL)
- Sir George Jessel Scholarship (2016), University College London, Mathematics Department (UCL)
- Lighthill Scholarship (2015), University College London, Mathematics Department (UCL)
- Conacyt Scholarship (2013 - 2018), full funding, Consejo Nacional de Ciencia y Tecnología (CONACYT)