

Research Activity Report

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17 Oct 2012 to 17 Nov 2025

A report made in Pure. Prepared by: (Pure@bath.ac.uk), 17/11/25 13:20

1. Research Applications Overview

Current application status > Status	Count
Application submitted to funder	1
Application awarded by funder	2
Application rejected by funder	3
Application withdrawn	1

2. Research Applications

Application date	Title	Funder	List of investigators	Role	Total application value	Application status
6/06/25	NIHR predoctoral award for Ananya Biswas	National Institute for Health Research	Karim Anaya-Izquierdo, Haiyan Zheng	PI	100,437	Application submitted to funder
25/09/23	CIMCOMP Hub - Core Project	Engineering and Physical Sciences Research Council	Karim Anaya-Izquierdo	PI	13,608	Application rejected by funder
18/01/22	GKN Prosperity Partnership	Engineering and Physical Sciences Research Council	Karim Anaya-Izquierdo	PI	28,084	Application awarded by funder
18/01/22	GKN Prosperity Partnership	GKN Aerospace	Karim Anaya-Izquierdo	PI	0	Application withdrawn
6/06/18	Re-shaping the Test Pyramid	Engineering and Physical Sciences Research Council	Robert Scheichl, Karim Anaya-Izquierdo	Col	425,044	Application awarded by funder
16/06/15	Statistical Assessment of Generalizability in Randomized Controlled Trials	MRC	Karim Anaya-Izquierdo	PI	173,295	Application rejected by funder
13/02/15	Centre for Mathematical	Engineering and Physical	Christopher Jennison,	Col	2,076,770	Application rejected by

Application date	Title	Funder	List of investigators	Role	Total application value	Application status
	Sciences in Healthcare	Sciences Research Council	Karim Anaya-Izquierdo, Nicole Augustin, Jonathan Dawes, Begona Delgado-Charro, Julian Faraway, Nikoletta Fotaki, Richie Gill, Richard Guy, Hartmut Logemann, Paul Milewski, Gavin Shaddick, Gordon Taylor, Grant Trewartha, Jane White			funder

3. Research and Related Projects

Research or related	Period	Title	Funder	List of investigators	Role	Awarded amount	Funding (non Agesso projects)
Funded project, Research council	1/12/23 → 30/11/28	GKN Prosperity Partnership	Engineering and Physical Sciences Research Council, Engineering and Physical Sciences Research Council, Engineering and Physical Sciences Research Council, Engineering and Physical Sciences Research Council	Richard Butler, Karim Anaya-Izquierdo, Chris Bowen, Antoine Buchard, Andy Burrows, John Chew, Chanel Fallon, Maciek Kopec, Evros Loukaides, Alexander Lunt, Rick Lupton, Tim Mays, Elise Pegg, Fulvio Pinto, Andrew Rhead, HaNa Yu	Col	£320,939.12, £1,125,111.20, £15,321.75, £19,231.16	
Funded project, University consultancy	4/10/21 → 29/10/21	Computation of damage tolerance b- basis values accounting for different energies and multiple impacts- Methodology and illustration creation	Airbus Operations Ltd	Karim Anaya-Izquierdo, Andrew Rhead	PI	£42,800.00	

Research or related	Period	Title	Funder	List of investigators	Role	Awarded amount	Funding (non Aggro projects)
Funded project, Research council	1/08/19 → 31/08/25	Re-shaping the Test Pyramid	Engineering and Physical Sciences Research Council, Engineering and Physical Sciences Research Council	Richard Butler, Karim Anaya-Izquierdo, Andrew Rhead, Robert Scheichl	Col	£466,856.21, £934,053.21	
Funded project, University consultancy	1/03/16 → 3/07/16	Environmental Variability of Composite Allowables	Airbus Operations Ltd	Karim Anaya-Izquierdo, Andrew Rhead	PI	£0.00	
Non-funded project, Research-related funding	27/10/17 → 27/10/19	Exploiting the analytic properties of accumulative hazards for survival analysis		Karim Anaya-Izquierdo	PI		£5,760
Non-funded project, Research-related funding	15/06/17 → 31/12/17	Innovative Statistical Techniques (and software) for the Analysis of International Large-Scale Assessments in Education		Andres Sandoval Hernandez, Karim Anaya-Izquierdo, Roman Aguirre Perez, Uziel Gonzalez Gonzalez	PI		£5,000
Non-funded project, UK industry	1/05/16 → 7/10/16	Consultancy for Airbus		Karim Anaya-Izquierdo, Catherine Barnaby, Lorna Wilson, Andrew Rhead	PI		21,300
Non-funded project, Research-related funding	1/02/16 → 31/08/17	Proposal for the Royal Statistical Society's Mardia Prize: Large-scale computing in statistical dependence models and uncertainty quantification		Karim Anaya-Izquierdo	PI		£8000 (Application rejected by funder)
Non-funded project, Research-related funding	1/08/15 → 31/07/16	Visiting PhD student project: On the development of new flexible and interpretable parametric		Karim Anaya-Izquierdo	Col		UoB fees (Application funded by the National Council for Scientific and Technological Development)

Research or related	Period	Title	Funder	List of investigators	Role	Awarded amount	Funding (non Aggresso projects)
		distributions and their use in survival analysis					(CNPq))

4. Research Publications Overview

Current publication status > Status	Count
In preparation	6
Published	15

5. Research Publications

Type	Current publication status > Status	Publication date	Publication Reference	Percentage contribution
Contribution to journal - Article	Published	5/08/25	Augustin, N, Albrecht, A, Anaya-Izquierdo, K, Davis, A, Meining, S, Puhlmann, H & Wood, S 2025, 'Modeling Tree Survival for Investigating Climate Change Effects', <i>Journal of the American Statistical Association</i> . https://doi.org/10.1080/01621459.2025.2516181	20%
		1/06/21	Anaya-Izquierdo, K & Alexander, N 2021, 'Spatial regression and spillover effects in cluster randomized trials with count outcomes', <i>Biometrics</i> , vol. 77, no. 2, pp. 490-505. https://doi.org/10.1111/biom.13316	70%
		31/05/21	Anaya-Izquierdo, K, Davis, A & Jones, MC 2021, 'A family of cumulative hazard functions and their frailty connections', <i>Statistics and Probability Letters</i> , vol. 172, 109059. https://doi.org/10.1016/j.spl.2021.109059	30%
		3/09/20	Alexander, N, Anaya-Izquierdo, K & Lenhart, A 2020, 'Spatial Spillover Analysis of a Cluster-Randomized Trial against Dengue Vectors in Trujillo, Venezuela', <i>PLoS Neglected Tropical Diseases</i> , vol. 14, no. 9, e0008576. https://doi.org/10.1371/journal.pntd.0008576	40%
		31/12/19	Dolgov, S, Anaya-Izquierdo, K, Fox, C & Scheichl, R 2019, 'Approximation and sampling of multivariate probability distributions in the tensor train decomposition', <i>Statistics and Computing</i> , vol. 30, no. 3, pp. 603-625. https://doi.org/10.1007/s11222-019-09910-z	20%
		21/04/15	Brauer, R, Smeeth, L, Anaya-Izquierdo, K, Timmis, A, Denaxas, SC, Farrington, CP, Whitaker, H, Hemingway, H & Douglas, I 2015, 'Antipsychotic drugs and risks of myocardial infarction: A self-controlled case series study', <i>European Heart Journal</i> , vol. 36, no. 16, pp. 984-992. https://doi.org/10.1093/eurheartj/ehu263	10%
		18/07/14	Vos, P & Anaya Izquierdo, KA 2014, 'Using Geometry to Select One Dimensional Exponential Families That Are Monotone Likelihood Ratio in the Sample Space, Are Weakly Unimodal and Can Be Parametrized by a Measure of Central Tendency', <i>Entropy</i> , vol. 16, no. 7, pp. 4088-4100. https://doi.org/10.3390/e16074088	50%
		1/02/14	Anaya Izquierdo, KA, Critchley, F & Marriott, P 2014, 'When are first order asymptotics adequate? A diagnostic', <i>Stat</i> , vol. 3, no. 1, pp. 17-22. https://doi.org/10.1002/sta4.40	35%
		20/09/13	Alexander, N & Anaya-Izquierdo, K 2013, 'Comments on 'Log	50%

Type	Current publication status > Status	Publication date	Publication Reference	Percentage contribution
			transformation: Application and interpretation in biomedical research", Statistics in Medicine, vol. 32, no. 21, pp. 3768-3769. https://doi.org/10.1002/sim.5774	
		1/07/13	Farrington, CP, Unkel, S & Anaya-Izquierdo, K 2013, 'Estimation of basic reproduction numbers: Individual heterogeneity and robustness to perturbation of the contact function', Biostatistics , vol. 14, no. 3, pp. 528-40. https://doi.org/10.1093/biostatistics/kxs054	30%
		1/12/12	Garthwaite, PH, Critchley, F, Anaya-Izquierdo, K & Mubwandarikwa, E 2012, 'Orthogonalization of vectors with minimal adjustment', Biometrika, vol. 99, no. 4, pp. 787-798. https://doi.org/10.1093/biomet/ass041	25%
Working paper / Preprint - Working paper	In preparation	1/07/24	Xiao, S, Scarth, C, Anaya-Izquierdo, K, Rhead, AT & Butler, R 2024 'Bayesian experimental design for composite structural testing based on expected information gain'.	
		1/07/24	Xiao, S, Laux, T, Dulieu-Barton, JM & Anaya-Izquierdo, K 2024 'Data fusion using Bayesian inference to predict behaviour of composite laminates subjected to multiaxial loading'.	
		1/05/24	Anaya-Izquierdo, K, Parry, M & Fox, C 2024 'Information separation and dimension reduction for inverse problems'.	
		1/01/24	Evans, J, Rhead, AT & Anaya-Izquierdo, K 2024 'Analytical compression after impact model incorporating GAMs statistical model for impact damage derived from experimental database'.	
		1/01/24	Davis, A & Anaya-Izquierdo, K 2024 'Survival parametric regression models based on the cumulative hazard function'.	
		1/06/20	Anaya-Izquierdo, K, Alexander, N, Lenhart, A, Morrison, AC & McCall, PJ 2020 'Spatial spillover analysis of the impact of insecticide-treated curtains on dengue seroconversion in a cluster-randomized trial'.	
Chapter or section in a book/report/conference proceeding - Book chapter	Published	1/01/13	Anaya-Izquierdo, K, Critchley, F, Marriott, P & Vos, P 2013, Computational information geometry in statistics: foundations. in F Nielsen & F Barbaresco (eds), Geometric Science of Information: First International Conference, Gsi 2013, Paris, France, August 28-30, 2013, Proceedings . vol. Part IX, Lecture Notes in Computer Science, vol. 8085, Springer, Berlin, Germany, pp. 311-318. https://doi.org/10.1007/978-3-642-40020-9_33	30%
		1/01/13	Anaya-Izquierdo, K, Critchley, F, Marriott, P & Vos, P 2013, Computational information geometry in statistics: mixture modelling. in F Nielsen & F Barbaresco (eds), Geometric Science of Information: First International Conference, GSI 2013, Paris, France, August 28-30, 2013. Proceedings. vol. IX, Lecture Notes in Computer Science, vol. 8085, Springer, Berlin, Germany, pp. 319-326. https://doi.org/10.1007/978-3-642-40020-9_34	30%
Chapter or section in a book/report/conference proceeding - Chapter in a published	Published	1/01/17	Anaya-Izquierdo, K, Marriott, P, Vos, P & Critchley, F 2017, On the geometric interplay between goodness-of-fit and estimation: Illustrative examples. in F Nielsen, K Dodson & F Critchley (eds), Computational Information Geometry : For Image and Signal Processing. Signals and Communication Technology, Springer, pp. 63-77. https://doi.org/10.1007/978-3-319-47058-0_3	30%

Type	Current publication status > Status	Publication date	Publication Reference	Percentage contribution
d conference proceeding		1/01/17	Anaya-Izquierdo, K, Critchley, F, Marriott, P & Vos, P 2017, Towards the geometry of model sensitivity: an Illustration. in F Nielsen, K Dodson & F Critchley (eds), Computational Information Geometry : For Image and Signal Processing. Signals and Communication Technology, Springer, pp. 33-62. https://doi.org/10.1007/978-3-319-47058-0_2	40%

6. Impact

Title	Impact Nature	Impact Level
Bayesian statistics for certification of Aerospace structures	Professional practice	UK only

7. Activities

Type	Title	Period	Description
Publication peer-review and editorial roles - Editorial activity	Statistical Methods and Applications (Journal)	1 Jan 2012 → 31 Dec 2013	
Knowledge Exchange (Industry, Government, NGOs) - Consultancy	Computation of damage tolerance b-basis values accounting for different energies and multiple impact: Methodology and Illustration Creation	1 Nov 2021 → 31 Dec 2021	This consultancy project will develop a rigorous statistical methodology to compute compression after impact (CAI) strength b-basis values when accounting for the probability of multiple impacts at different energies.
	Environmental Variability of Composite Allowables	1 May 2016 → 7 Oct 2016	This consultancy project applied statistical theory to allow inclusion of environmental variability, in the definition of a B-basis allowable, implemented the algorithms, using VBA behind an Excel spreadsheet, to include temperature and aging variability and Evaluated confidence in results, improving understanding of the methodology.
External examination and supervision - External supervision / mentoring	On the development of new flexible and interpretable parametric distributions and their use in survival analysis	1 Aug 2015 → 30 Jul 2016	External PhD supervisor (1 year) of Mrs Daniele Granzoto PhD student at the University of Sao Paulo,Brazil
	Spatial Analysis of Cluster Randomised Trials'	1 Apr 2015 → 30 Oct 2018	Co-supervisor of Mr Christopher Jarvis, PhD student at LSHTM
Public, Community and School Engagement - Public talk, lecture,	Flexible parametric survival regression modelling	16 May 2024	In this talk I will introduce a novel regression modelling methodology where

Type	Title	Period	Description
debate, seminar, workshop			the key building block is the cumulative hazard function rather than the hazard rate function. We exploit analytical properties that allow the cumulative hazard to serve as a clean modelling tool to construct new and flexible parametric survival regression models as well as new frailty models that do not require explicit integration. We will show that the new constructions recover and generalise known models such as the Proportional Hazards and Accelerated Failure Time models. We illustrate some aspects of the methodology in some real and simulated datasets.
Visiting an external academic institution - Visiting researcher	University of Otago	1 Feb 2024 → 31 Jul 2024	Research (sabbatical) leave.
Academic conferences and events (excluding conference publications) - Conference presentation / attendance	Composite Materials Handbook 17 (CMH-17) PMC Coordination Meeting	21 Oct 2019 → 24 Oct 2019	Key international event on the certification of aerospace structures
	Introduction to Information Geometry: Distributional Theory	28 Sept 2018	Short (one day) course. In Spanish. International conference (South America).
	International Workshop on Bayesian Inference and Maximum Entropy Methods in Science and Engineering	9 Jul 2017 → 14 Jul 2017	This is a long standing conference with high profile international participation (150 attendees)
	3rd International Clinical Trials Methodology Conference	16 Nov 2015	Poster "Software for spatial analysis and visualisation of cluster randomised trials - a review of available tools" at the 3rd International Clinical Trials Methodology Conference, Glasgow.
	Current developments in cluster randomised trials and stepped wedge designs	7 Oct 2015	Contributed talk "Spatial regression and indirect effects in cluster randomized trials". Specialised workshop. UK wide conference (~ 30 attendees)
	Computational Information Geometry for Signal and Image Processing signal processing	21 Sept 2015 → 25 Sept 2016	Invited Talk. International workshop with high profile international participation (30 attendees).
Academic conferences and events (excluding conference publications) - Other academic event	Improving Administrative Records for SDGs implementation and evidence-based policymaking in	9 Mar 2020 → 14 Mar 2020	Professional development course (Statistics) to civil servants of the government of Paraguay

Type	Title	Period	Description
(organisation, presentation, attendance)	Paraguay		
	1 day course on Medical Statistics	19 Sept 2018	1 day course on Medical Statistics
	Machine Learning - Ficha Social	30 Jul 2018 → 3 Aug 2018	Machine Learning course to civil servants of the government of Paraguay.
	Annual conference of the Mexican Statistical Association	28 Sept 2017	1 day course course on the applications of Differential Geometry to Statistics (~20 attendees)
	Thinking Globally: The Role of Big Data	23 Feb 2016 → 24 Feb 2016	"Thinking Globally: The Role of Big Data"
	The self controlled case series method: A few generalities and some extensions	31 Oct 2015	2 day course, 2nd BUC Workshop series, National University of Mexico, Mexico City. One of the three speakers. Advanced Statistics course for postgraduates Mathematics students and research assistants (~20 participants)
			Speaker. Internal seminar (regular series) in the Department of Pharmacy and Pharmacology (Bath)

8. Prizes

9. Postgraduate Supervision

Student name	Research degree	Period	Supervisor role	Percentage supervision	Other supervisors
Alice Davis	Teaching & Other, Doctor of Philosophy	9/08/18 → 8/12/20, 29/09/14 → 22/11/18		100%	