Curriculum Vitae | Elena Castilla González

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Web Of Science AAA-7913-2020
Scopus: 57200608540

Positions

2025 **Associate Professor (Profesora Titular).** March 24, 2025 – Present
Department of Applied Mathematics, Rey Juan Carlos University of Madrid

2022 **Assistant Professor (Profesora Ayudante Doctora).** March 16, 2022 – March 23, 2025
Department of Applied Mathematics, Rey Juan Carlos University of Madrid

2021 **Assistant Professor (Profesora Ayudante).** May 1, 2021 – March 15, 2022
Department of Statistics and Operational Research I, Complutense University of Madrid

2017 **Predoctoral Contract - University Teaching Staff Training (FPU).** October 1, 2017 – April 30, 2021
Department of Statistics and Operational Research I, Complutense University of Madrid

2017 **Predoctoral Contract - UCM Research Staff Training.** February 1, 2017 – September 30, 2017
Department of Statistics and Operational Research I, Complutense University of Madrid

Education

2021 **PhD in Mathematical Engineering, Statistics, and Operations Research (IMEIO)**
Complutense University of Madrid (UCM) and Polytechnic University of Madrid (UPM)

2016 **Master's in Computational Statistical Data Analysis (TECI)**
Complutense University of Madrid (45 ECTS) and Polytechnic University of Madrid (15 ECTS)

2015 **Bachelor's Degree in Mathematics and Statistics**
Faculty of Mathematical Sciences, Complutense University of Madrid (240 ECTS)

Research Stays

2019 University of Ioannina, Greece (2 months)
2018 McMaster University, Hamilton, Canada (2 months)
2016 McMaster University, Hamilton, Canada (1 month)

Summary

I am an Associate Professor (“Profesora Titular”) at Rey Juan Carlos University. I hold a Bachelor's degree in Mathematics and Statistics (Extraordinary Award), as well as an MSc and a PhD with International Mention and Extraordinary Doctorate Award from Complutense University of Madrid. During my PhD, I completed research stays at McMaster University and University of Ioannina. I have been awarded a positive six-year research assessment (Sexenio, 2017–2022), a five-year teaching assessment (Quinquenio, 2018–2022), and an Excellent rating in the DOCENTIA programme (2022–2024).

My research focuses on regression and reliability models, survival analysis, and statistical information theory, with an emphasis on robust methods based on statistical divergences. I collaborate internationally and co-authored the book *Statistical Modeling and Robust Inference for One-Shot Devices* (Elsevier, 2025, with N. Balakrishnan).

I lead a URJC-funded project on robust inference for mixture cure rate models, and I am a member of the Computational Methods in Statistics and Topology (COMESTOP) research group. My work has received several awards, including the Ramiro Melendreras Award (SEIO, 2021), the Vicent Caselles Award (RSME–BBVA, 2022), and the Margarita Salas Award (Madrid City Council, 2022). I have also represented Spain at the European Young Statisticians Meeting and participated in the Heidelberg Laureate Forum.

I have delivered invited talks, presented my work at international conferences, and served on the scientific committees of SYSORM and EYSM. I co-organised the URJC Mathematics Seminar Series (2022–2024), I serve on the AEI Expert Panel and as an evaluator for the madri+d Foundation, and I am an Associate Editor of the *Communications in Statistics* journals.

Publications

Books

[1]. Balakrishnan, N. & Castilla, E. (2025). *Statistical Modeling and Robust Inference for One-shot Devices*, Academic Press, Elsevier. ISBN: 9780443141539. Link

Research Articles

[1]. Balakrishnan, N. & Castilla, E. (2027). Reliability Analysis of Limited Failure One-Shot Devices with Covariate-Dependent Failure Times. *Quality and Reliability Engineering International.* Accepted.

[2]. Castilla, E. (2026). New estimation methods for cognitive diagnostic models. *British Journal of Mathematical and Statistical Psychology*. Link.

[3]. Castilla, E. (2026). Robust estimation for mixture cure rate models with current status data. *Journal of Computational and Applied Mathematics (Elsevier)*. 487, 117721. Link

[4]. Kharazmi, O. & Castilla, E. (2026). Jensen-ϕ-entropy, g-mean mixture distributions and optimal information: Application to binary models. *Computational and Applied Mathematics (Springer).* 45: 330. Link

[5]. Balakrishnan, N. & Castilla, E. (2026). Distance-based estimation under progressive Type-I interval censoring. *Journal of Statistical Computation and Simulation*. 96(8), 2028–2046. Link

[6]. Balakrishnan, N. & Castilla, E. (2026). Reliability analysis of limited failure one-shot devices. *IEEE Transactions on Reliability,* 75, pp. 157-170. Link

[7]. Castilla, E. (2026). Parametric estimation and robust inference for current status data with Lindley lifetimes. *Communications in Statistics-Simulation and Computation*. *55*(5), 1741–1759. Link

[8]. Balakrishnan, N. & Castilla, E. (2025). Robust inference and model selection for data from one-shot devices under cyclic accelerated life-tests with an application to a test of CSP solder joints. *Journal of Risk and Reliability*. 239(5), pp. 900-914. Link

[9]. Kharazmi, O., Castilla, E. & Yalcin, F. (2025). On Jensen-phi-divergence measure: applications to logistic regression model and image processing. *Computational and Applied Mathematics (Springer).* 44: 323. Link

[10]. Castilla, E. (2024). A new robust approach for the polytomous logistic regression model based on Rényi's pseudodistances. *Biometrics*, 80(4). Link

[11]. Castilla, E. (2024). A new estimation approach based on phi-divergence measures for one-shot device accelerated life testing. *Quality and Reliability Engineering International*, 40, pp. 2048-2066. Link

[12]. Balakrishnan, N. & Castilla, E. (2024). Robust inference for destructive one-shot device test data under Weibull lifetimes and competing risks. *Journal of Computational and Applied Mathematics (Elsevier)*, 437, 115452. Link

[13]. Balakrishnan, N. & Castilla, E. (2023). Robust estimation based on one-shot device test data under log-normal lifetimes. *Statistics*, 57(5), pp. 1061-1086. Link

[14]. Balakrishnan, N., Castilla, E., Jaenada M. & Pardo, L. (2023). Robust inference for non-destructive one-shot device testing under step-stress model with exponential lifetimes. *Quality and Reliability Engineering International*, 39(4), pp. 1192-1222. Link

[15]. Balakrishnan, N., Castilla, E., Martín N. & Pardo, L. (2023). Power divergence approach for one-shot device testing under competing risks. *Journal of Computational and Applied Mathematics (Elsevier)*, 419, 114676. Link

[16]. Castilla, E. & Ghosh, A. (2023). Robust minimum divergence estimation for the multinomial circular logistic regression model. *Entropy*, 25(10), 1422. Link

[17]. Castilla, E. (2023). Robust Circular Logistic Regression model and its application to Life and Social Sciences. *Revista Colombiana de Estadística*, 46(1), pp. 45-62. Link

[18]. Castilla, E. (2022). Robust estimation of the spherical normal distribution. *Mathematica Applicanda*, 50, pp. 43-63. Link

[19]. Castilla, E. & Chocano, P.J. (2022). A new robust approach for multinomial logistic regression with complex design model. *IEEE Transactions on Information Theory*, 68(11), pp. 7379-7395. Link

[20]. Castilla, E. & Zografos, K. (2022). On distance-type Gaussian estimation. *Journal of Multivariate Analysis*, 188, 104831. Link

[21]. Balakrishnan, N. & Castilla, E. (2022). EM-based likelihood inference for one-shot device test data under log-normal lifetimes and the optimal design of a CSALT plan. *Quality and Reliability Engineering International*, 38(2), pp. 780-799. Link

[22]. Balakrishnan, N., Castilla, E. & Ling, M.H. (2022). Optimal designs of Constant-Stress Accelerated Life-Tests for one-shot devices with model misspecification analysis. *Quality and Reliability Engineering International*, 38(2), pp. 989-1012. Link

[23]. Castilla, E., Jaenada, M., Martín, N. & Pardo, L. (2022). Robust approach for comparing two dependent normal populations through Wald-type tests based on Rényi's pseudodistance estimators. *Statistics and Computing*, 32:100. Link

[24]. Castilla, E., Jaenada, M. & Pardo, L. (2022). Estimation and testing on independent not identically distributed observations based on Rènyi's pseudodistances. *IEEE Transactions on Information Theory*, 68(7), pp. 4588-4609. Link

[25]. Balakrishnan, N., Castilla, E., Martín N. & Pardo, L. (2021). Divergence-based robust inference under proportional hazards model for one-shot device life-test. *IEEE Transactions on Reliability*, 70(4), pp. 1355-1367. Link

[26]. Castilla, E., Martín, N., Pardo, L. & Zografos, K. (2021). Composite likelihood methods: Rao-type tests based on composite minimum density power divergence estimator. *Statistical Papers*, 62, pp. 1003–1041. Link

[27]. Castilla, E., Martín, N. & Pardo, L. (2021). Testing linear hypotheses in Logistic Regression Analysis with complex sample survey data based on phi-divergence measures. *Communications in Statistics-Theory and Methods*, 50(22), pp. 5228-5247. Link

[28]. Castilla, E., Ghosh, A., Martín, N. & Pardo, L. (2021). Robust semiparametric inference for polytomous logistic regression with complex survey design. *Advances in Data Analysis and Classification*, 15, pp. 701-734. Link

[29]. Castilla, E., Martín N., Muñoz S. & Pardo, L. (2020). Robust Wald-type tests based on minimum Rényi pseudodistance estimators for the multiple regression model. *Journal of Statistical Computation and Simulation*, 90(14), pp. 2655-2680. Link

[30]. Balakrishnan, N., Castilla, E., Martín N. & Pardo, L. (2020). Robust inference for one-shot device testing data under exponential lifetime model with multiple stresses. *Quality and Reliability Engineering International*, 36, pp. 1916-1930. Link

[31]. Castilla, E., Martín, N., Pardo, L. & Zografos, K. (2020). Model Selection in a composite likelihood framework based on density power divergence. *Entropy*, 22(3), 270. Link

[32]. Balakrishnan, N., Castilla, E., Martín N. & Pardo, L. (2020). Robust inference for one-shot device testing data under Weibull lifetime model. *IEEE Transactions on Reliability*, 69(3), pp. 937-953. Link

[33]. Balakrishnan, N., Castilla, E., Martín N. & Pardo, L. (2019). Robust estimators for one-shot device testing data under gamma lifetime model with an application to a tumor toxicological data. *Metrika*, 82(8), pp. 991–1019. Link

[34]. Balakrishnan, N., Castilla, E., Martín N. & Pardo, L. (2019). Robust estimators and test-statistics for one-shot device testing under the exponential distribution. *IEEE Transactions on Information Theory*, 65(5), pp. 3080-3096. Link

[35]. Castilla, E., Ghosh, A., Martín, N. & Pardo, L. (2018). New statistical robust procedures for polytomous logistic regression models. *Biometrics*, 74(4), pp 1282-1291. Link

[36]. Castilla, E., Martín, N., Pardo, L. & Zografos, K. (2018). Composite likelihood methods based on minimum density power divergence estimator. *Entropy*, 20(1), 18. Link

[37]. Castilla, E., Martin, N. & Pardo, L. (2018). Minimum phi-divergence estimator for the multinomial logistic regression model with complex sample design. *AStA Advances in Statistical Analysis*, 102(3), pp 381-411. Link

Book Chapters

[1]. Castilla, E. & Chocano, P.J. (2023). *On the choice of the optimal tuning parameter in robust one-shot device testing analysis*. (Eds. N. Balakrishnan et al.) Trends in Mathematical, Information and Data Sciences. Studies in Systems, Decision and Control, vol 445. Springer, Cham, pp. 169-180. Link

[2]. Balakrishnan, N., Castilla, E. & Pardo, L. (2021). *Robust statistical inference for one-shot devices based on density power divergences: An overview*. (Eds. B. C. Arnold et al.) Methodology and Applications of Statistics, A Volume in Honor of C.R. Rao on the Occasion of his 100th Birthday, Contributions to Statistics. Springer, NY, pp. 3-42. Link

[3]. Castilla, E., Martin, N. & Pardo, L. (2018). *A Logistic Regression Analysis approach for sample survey data based on phi-divergence measures.* (Eds. E. Gil et al.) The Mathematics of the Uncertain. Studies in Systems, Decision and Control, vol 142. Springer, Cham, pp. 465-474. Link

Other Articles

[1]. Castilla, E. (2025). *Reflexiones de una investigadora en sus primeros años de carrera*. Boletín de Estadística e Investigación Operativa, 41(1), pp. 72-73. Link

[2]. Castilla, E. & Chocano, P.J. (2023). *Una breve introducción al método de Monte Carlo.* Gaceta de la Real Sociedad Matemática Española. 26(1), pp. 87-108. Link

[3]. Castilla, E. (2022). Thesis Abstract: *Robust statistical inference for one-shot devices based on divergences.* Journal & Proceedings of the Royal Society of NSW, 155(1), pp 114-115. Link

[4]. Castilla, E. (2022). Thesis Abstract: *Inferencia estadística robusta para dispositivos de un solo uso.* Boletín de Estadística e Investigación Operativa, 38(1). Link

[5]. Chocano, P.J. & Castilla, E. (2021). *Estadística multivariante aplicada al análisis y predicción de partidos de fútbol en las principales ligas europeas*. Pensamiento Matemático. 11(2), pp. 021–030. Link

[6]. Castilla, E. & Chocano, P.J. (2021). *Enseñanza del Software Estadístico R a alumnos de Matemáticas*. Pensamiento Matemático. 11(1), pp. 057-068. Link

Associate Editor in: Communications in Statistics (2025-Present)
Referee in (among others): Biometrics, Computational Statistics, Engineering & System Safety, IEEE trans. on Reliability.

Congress and Seminars

Congress

2026 New robust estimation methods for diagnostic classification models (E. Castilla). *9th International Conference on Econometrics and Statistics: EcoSta 2026*, **Japan (Online)**

2023 Inference for one-shot devices under competing risks model (E. Castilla). *XII Conference on Mathematical Methods in Reliability*, **Murcia**

2022 Robust statistical inference for one-shot devices (E. Castilla). *5th International Conference on Econometrics and Statistics: EcoSta 2022*, **Japan (Online)**

2021 Inference for one-shot device test analysis under log-normal lifetimes (N. Balakrishnan, E. Castilla) *22nd European Young Statistician Meeting,* Atenas, **Greece (Online)**

2021 Inference for one-shot device test data under log-normal lifetimes (N. Balakrishnan, E. Castilla) *Jornadas SEIO 2021*, **Granada (Online)**
Ramiro Melendreras Award

2021 Minimum RP estimators for independent but not identically distributed observations (E. Castilla, M. Jaenada & L.Pardo). *19th Conference of the Applied Stochastic Models and Data Analysis International Society (ASMDA2021)*, Athens, **Greece (Online)**.

2021 A robust approach for multinomial logistic regression model. Application to mammography experience data (E. Castilla, P. J. Chocano). *LMS Women in Mathematics Day*. University of Plymouth, **England (Online)**. Poster

2020 Diseño óptimo de tests de vida acelerados para dispositivos de un solo uso (E. Castilla). *IMEIO-DecData: Decisión Optimización y Ciencia de Datos*, UCM, **Madrid**

2019 Robust inference for one-shot device testing under the Weibull distribution with multiple stress factors (E. Castilla). *Symposium on Information Theory with Applications to Statistical Inference*, UCM, **Madrid**

2019 Robust tests based on Minimum Rényi Pseudodistance Estimators for the MRM (E. Castilla, N. Martin, S. Muñoz, L. Pardo). *2nd young statisticians and operational research meeting*, El Escorial, **Madrid**

2019 A new approach to polytomous regression models (E.Castilla) *32 Panhellenic Statistics Conference*, University of Ioannina, **Greece**

2019 One shot device testing under exponential distribution: a new robust approach (E. Castilla), *IV International Workshop on Proximity Data, Multivariate Analysis and Classification*, **Salamanca**

2018 MPDE for one-shot device testing under the exponential distribution (E.Castilla) *II Edición Simposio "Cuéntanos tu Tesis"*. Universidad Politecnica de Madrid, **Madrid**, 14-16 Marzo 2018. (Poster)

2017 Minimum density power divergence estimators for one-shot device model (E.Castilla) *1St Spanish Young Statisticians and Operational Researchers Meeting, SYSORM*. Universidad de Granada, **Granada**

2017 Minimum density power divergence estimators for polytomous logistic models (E.Castilla) *III International Workshop on Proximity Data, Multivariate Analysis and Classification*. **Valladolid**

2017 New statistical procedures for polytomous logistic models (E.Castilla) *XI Workshop of Young Researches in Mathematics*. Universidad Complutense de Madrid, **Madrid**

2017 New robust estimators for one-shot device testing under the exponential distribution (E. Castilla) *Young Statisticians' Meeting 2017*, Keele University (**England**)

2017 Option management with discontinuities in the payoff: distribution of probability of losses (**Banco Popular**) *XI UCM Modelling Week, Master in Mathematical Engineering*. Universidad Complutense de Madrid, Madrid

2016 New estimators for multinomial logistic regression using complex survey data. A comparison to pseudo maximum likelihood estimator (E.Castilla) *X Workshop of Young Researches in Mathematics*. Universidad Complutense de Madrid, **Madrid**

2016 Estimadores basados en distancias de Regresión Logística Multinomial con muestreo estratificado por conglomerados. (E.Castilla, N.Martín, L.Pardo) *XXXVI Congreso Nacional de Estadística e Investigación Operativa*. Universidad de Castilla-La Mancha, **Toledo**

2016 The asymptotic behavior of the minimum phi-divergence estimator for multinomial logistic regression models using complex survey data Designs (E.Castilla, N.Martín, L.Pardo). *Ordered Data and their Applications in Reliability and Survival Analysis*. McMaster University, Hamilton (**Canada**)

2016 Visual object detection in live video stream (**APICAL LTD**, United Kingdom)**.** *X UCM Modelling Week, Master in Mathematical Engineering*. Universidad Complutense de Madrid, Madrid

Seminars

2025 *Estadística computacional: estudio de fiabilidad en dispositivos de un solo uso.* Departamento de Matemáticas e Informática aplicadas a las Ingenierías Civil y Naval, UPM, **Madrid**.

2024 *A robust approach for the polytomous logistic regression model based on divergence measures* (E. Castilla). Monthly Seminar of the Statistics Department, Vali-e-Asr University of Rafsanjan, **Iran** (Online)

2024 *Modelización de los tiempos de vida en dispositivos de un solo uso: un enfoque robusto* (E. Castilla). Seminario del Departamento de Matemática Aplicada I, ETSI Industriales, UNED, **Madrid**

2022 *Modelización de los tiempos de vida en dispositivos de un solo uso* (E. Castilla). Ateneo imUVa, **Valladolid**

2022 *Dispositivos de un sólo uso: retos y dificultades* (E. Castilla). Seminario de investigación del departamento de Matemática Aplicada de la Uinversidad Rey Juan Carlos, **Móstoles**

2021 *Dispositivos de un sólo uso: tratamiento de datos con censura interválica extrema* (E. Castilla). Ciclo de Conferencias del IMI-DSC: Decisión, Optimización y Ciencia de Datos IMI-DSC, **Madrid**

2019 *Distance-based Inference for one-shot devices* (E. Castilla). Seminar on Department of Mathematics, Ioannina University, **Greece**

2019 *Inferencia Robusta para dispositivos de un solo uso* (E. Castilla). Seminario Doctorandos, Facultad Ciencias Matemáticas Universidad Complutense de Madrid, **Madrid**

Other Activities

2024 Speaker at EL PAIS CON TU FUTURO, X Edition, in the Science and Technology room

2024 Young Researcher Participant at the 11th Heidelberg Laureate Forum (HLF)

Committees

Co-organizer of the Mathematics Seminar, Department of Applied Mathematics, Rey Juan Carlos University, Madrid, September 2022 – December 2024.

2025 5th young statisticians and operational research meeting (SYSORM), Sevilla (Scientific Committee)

2024 4rd young statisticians and operational research meeting (SYSORM), Santiago de Compostela (Scientific Committee)

2023 23rd European Young Statistician Meeting, Slovenia, 11-15 September (Scientific Committee)

2023 Día Pi. Universidad Rey Juan Carlos, Móstoles (Organizing Committee)

2022 3rd young statisticians and operational research meeting (SYSORM), Elche (Scientific Committee)

2019 2nd young statisticians and operational research meeting (SYSORM), El Escorial (Organizing Committee)

2018 XII Workshop of Young Researchers in Mathematics. Universidad Complutense de Madrid, Madrid (Organizing Committee)

Research Projects

Principal Investigator

2026: *Inferencia Robusta para Modelos de Cura Mixtos basada en Medidas de Divergencia (Robust Inference for Mixture Cure Rate Models based on Divergence Measures).*
Funding agency: Rey Juan Carlos University: 2025/SOLCON-159637.
Total funding: €4,150.
Team members: E. Castilla, P.J.Chocano, N.Balakrishnan, A.Ghosh, M.H.Ling.

Team Member

2019-2022: *Estimación y contrastes de hipótesis robustos para datos de alta dimensión (Robust estimation and hypothesis testing for high-dimensional data).*
Funding agency: Ministry of Science, Innovation and Universities: PGC2018-095194-B-I00.
Total funding: €26,800.

2016-2019: *Estimación y Contrastes basados en Medidas de divergencia para la modelización de dispositivos de un solo uso. (Divergence-based estimation and hypothesis testing for one-shot devices).*
Funding agency: Ministry of Economy and Competitiveness: MTM2015-67057-P.
Total funding: €35,600.

Miscellaneous

Awards and Distinctions

2022 3rd Prize Margarita Salas Research Award, Basic Sciences Category, City of Madrid
2022 Vicent Caselles Award, Royal Spanish Mathematical Society and BBVA Foundation
2021 Ramiro Melendreras Award, Spanish Society of Statistics and Operations Research (SEIO)
2021 Extraordinary Doctorate Award for the 2020-2021 Cohort, Complutense University of Madrid
2015 Extraordinary Final Degree Award for the 2014-2015 Cohort, Bachelor's Degree in Mathematics and Statistics, Complutense University of Madrid
2015 Best Academic Record Award for the 2014-2015 Cohort, Bachelor's Degree in Mathematics and Statistics, Complutense University of Madrid

Grants

2019 FPU short stay scholarship, Ministry of Education, Culture, and Sports
2018 FPU short stay scholarship, Ministry of Education, Culture, and Sports
2017 FPU scholarship, Ministry of Education, Culture, and Sports
2016 Scholarship from Complutense University for predoctoral research contracts for training researchers
2015 Master's study aid from the Faculty of Mathematical Sciences, UCM
2015 Collaboration scholarship 2015-2016. Department of Statistics and Operations Research I, UCM
2015 Excellence Scholarship, Community of Madrid

Other Merits

2025 Excellent rating in the “DOCENTIA” university teaching assessment program
2024 Selected to attend the 11th Heidelberg Laureate Forum, HLF
2023 Accredited by ANECA as a “Profesora Titular”
2021 Selected to represent Spain in the 22nd European Young Statisticians Meeting, European Regional Committee of the Bernoulli Society for Mathematical Statistics and Probability (2021)
2021 Accredited by ANECA as a “Profesora Ayudante Doctora” and “Profesora Contratada Doctora”