

Jairo Alberto Fúquene Patiño

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INTERESTS

Bayesian Demography. Clustering methods, weakly informative priors, regularization and shrinkage approaches, scalable methods for high-dimensional inference, nonparametric Bayesian models, Markov chain Monte Carlo methods, Bayesian dynamic models. Bayesian methodology with applications to financial time series, fMRI, clinical trials, environmental data, epidemiology data, population projections and migration. Bayesian mixtures and small area estimation.

EDUCATION

Ph.D., Statistics (October 2018)
University of Warwick, Coventry (United Kingdom)
Dissertation Title: Finite Mixture Modeling with Non-Local Priors
Advisor: Mark Steel and David Rossell
Award: Harrison Award for a Highly Commended PhD Thesis.

M.S., Statistics and Applied Mathematics (March 2013)
University of California, Santa Cruz (UCSC, USA)
Project Title: A Multivariate Bayesian Dynamic Model for fMRI
Advisor: Raquel Prado

M.S., Mathematics (August 2008).
University of Puerto Rico, San Juan, PR (UPR-RP)
Concentration: Statistics
Project Title: A Case for Robust Priors with Applications to Clinical Trials
Advisor: Luis Pericchi
Award: Student Paper Competition Winner (2008). American Statistical Association. Section on Bayesian Statistical Science. Denver. USA.

B.S., Statistics (June 2004).
Universidad Nacional de Colombia, Bogotá, Colombia
Project Title: The P.P.T. Design with Categorical Variables to Estimate Dicho-Ratios
Advisor: Leonardo Bautista
Award: Honor Thesis.

POSITIONS

Assistant professor. Department of Statistics. University of California, Davis (2020-current)

Postdoctoral Associate. Duke University, Department of Statistical Science (2019-2020)

Statistical consultant to *Vital Strategies, on the Bloomberg Philanthropies Data for Health Initiative*. (July 2018 - July 2019). Support the National Statistics Office (DANE) and the Ministry of Health in Colombia with new statistical alternatives,

- Research on Bayesian flexible models.
- Research on statistical models for small area estimation.
- Workshops on Bayesian population projections.
- Demographic health survey (DHS) - research project on sexual violence .

Lecturer. Full Time. *University of Puerto Rico. Institute of Statistics. Business School. Río Piedras Campus, San Juan, Puerto Rico.* (2008-2011)

- Courses for the Business School: Statistics Theory, Business Statistics I and II, Quantitative Methods I and II, Bayesian Statistics.

Statistician, Technical Adviser and Instructor (2004, 2005, 2006, 2011, 2013, 2017, 2018 and 2020). *National Department of Statistics, Colombia*.

- Household income and expenditure (2004-2006).
- Survey sampling designs (2011).
- Census-College (2006). Proposal for imputation of missing data using time series.
- Population Census (2005).
- Instructor for Bayesian Dynamic Linear Models (Summer-2013). Instructor for Bayesian Statistics with R (Summer-2013). Instructor for Big Data (Summer-2017).
- Technical adviser, (2018).
- Small Area Estimation Poverty Indicators (2020).

AWARDS AND HONORS

Campos Scholar. (2020). University of Davis. USA.

Harrison Award for a Highly Commended PhD Thesis. (2019). University of Warwick. UK.

ISBA travel award (2018). Edinburgh. Scotland.

ISBA travel award (2016). Sardinia. Italy.

Young ISBA Travel Award of the COBAL IV, Poster version. (2015).

Fellowship - Bursary. (2013). Department of Statistics. University of Warwick. England. United Kingdom.

Paper Travel Award, (2012). Joint San Francisco Chapter of the American Statistical Association. San Francisco. California. USA.

Chancellors Fellowship (2011) University of California, Santa Cruz . California. USA.

Travel Award to 8th Workshop on Bayesian Nonparametrics, Veracruz, Mexico (2011).

Student Travel Award. D.E.G.I. University of Puerto Rico (2009) to International 2009 Bayesian Objective Conference. Pittsburg. USA.

Student Paper Competition Winner (2008). American Statistical Association. Section on Bayesian Statistical Science. Denver. USA.

Grant Travel Award to Joint Statistical Meeting (2008). Department of Mathematics. University of Puerto Rico..

Grant Travel Award (2008), Bayesian Biostatistics Conference. The University of Texas and M.D. Anderson Cancer Center.

Scholarship program for Academic Merit and Exceptional Achievements for Graduate Students, granted by DEGI (Dean for Graduate Studies and Research), University of Puerto Rico (2006).

Honor Thesis. (2006). National University of Colombia. Bogota. Colombia.

ACADEMIC SERVICE

Referee for *Colombian Journal of Statistics* (2008), *Biometric Brazilian Journal* (2011), *Forum Empresarial* (2011), *European Journal of Operational Research* (2013), *Journal of Applied Statistics* (2014), *Comunicaciones en Estadística* (2014), *Computational Statistics and Data Analysis* (2014), *International Journal of Electronic and Communications* (2016), *Journal of Econometrics and Statistics* (2017), *The Indian Journal of Statistics (Sankhya)* (2017), *Bayesian Analysis* (2018), *Journal of Statistical Analysis and Data Mining* (2018) and *Bayesian Analysis* (2019), *Journal of the American Statistical Association* (2019).

SELECTED PUBLICATIONS

Fúquene, J., Steel, M., Rossell, D. (2019). "On choosing mixture components via non-local priors." *Journal of the Royal Statistical Society B*, 81, 5, 809-837. [arXiv:1604.00314](https://arxiv.org/abs/1604.00314)

Fúquene, J., Betancourt, B., Pereira, J. B. M. (2017). "A weakly informative prior for Bayesian dynamic model selection with applications in fMRI". *Journal of Applied Statistics*.

Fúquene, J., (2015). "A semi-parametric Bayesian extreme value model using a Dirichlet process mixture of gamma densities". *Journal of Applied Statistics*, 42(2), 267-280.

Fúquene, J., Prez, M. E., Pericchi, L. R. (2014). "An alternative to the Inverted Gamma for the variances to modelling outliers and structural breaks in dynamic models". *Brazilian Journal of Probability and Statistics*, 28(2), 288-299.

Fúquene, J., Delgado, M. (2012). "A note on Bayesian robustness for count data". *Brazilian Journal of Probability and Statistics*, 279-287.

Fúquene, J., Cook, J. D., Pericchi, L. R. (2009). "A case for robust Bayesian priors with applications to clinical trials". *Bayesian Analysis*, 4(4), 817-846.

OTHER REFEREED PUBLICATIONS

Fúquene, J., Alvarez, M., Pericchi, L. R. (2015). "A robust Bayesian dynamic linear model for Latin-American economic time series: the Mexico and Puerto Rico cases". *Latin American Economic Review*, 24(1), 6.

Delgado, M., Portnoy, A., **Fúquene, J.** (2010). "Controlling the Oscillations of a Variable Length Pendulum". *Brazilian Journal of Probability and Statistics*

Fúquene, J., Betancourt, B., Vega, J. (2011). "Heavy tailed priors: An alternative to non-informative priors in the estimation of proportions on small areas". *Biometrics Brazilian Journal*, v.29, n.3, pg 520-533. [arXiv:1107.2724](https://arxiv.org/abs/1107.2724)

Fúquene, J. (2009). "Robust Bayesian priors in clinical trials: An R package for practitioners". *Biometric Brazilian Journal*, 27, 627-643.

Cook, J., **Fúquene, J.**, Pericchi, L. (2011). "Skeptical and optimistic robust priors for clinical trials". *Revista Colombiana de Estadística*, 34(2), 333-345.

Fúquene, J., (2005). "Dico Ratio Estimation with Auxiliary Information in 3×3 Contingency Tables". *Revista Colombiana de Estadística*, 28(2), 141-154.

Fúquene, J., Bautista, S. (2005). "PPT designs with categorical variables for the estimation of dicho-ratios". *Revista Colombiana de Estadística*, 28(1), 97-112.

TEACHING EXPERIENCE

Lecturer, University of Puerto Rico (2008-2011)

- Courses for the Business School: Statistics Theory, Business Statistics I and II, Quantitative Methods I and II, Bayesian Statistics.

Instructor, Warwick

- Statistics computing with R (2014)

Teaching Assistant, UCSC

- AMS 7 Statistical Methods for the Biological, Environmental, and Health Sciences (Winter 2013)

Teaching Assistant, UPR

- Mathematics Immersion (Summer 2008, Summer 2009)

Graduate Student Instructor, UPR (2006-2008)

- Math 3105 Appreciation of Mathematics (2 semesters)
- Math 3001 Introductory Mathematics I (2 semesters)

PROFESSIONAL EXPERIENCE

National Department of Statistics. Bogotá, Colombia. Household income and expenditure survey 2011. Education-Census 2006. Census 2005. Survey sampling design. Instructor for Bayesian Dynamic Linear Models. 2013. Instructor for Bayesian Statistics with R. 2013. Instructor for Big Data. 2017. Technical adviser, (2018)

PRESENTATIONS

Poster presentation at Bayes Comp 2020, Gainesville, Florida. 2020.

Participant 28th Annual Morris Hansen Lecture, Washington D.C. October 2019.

Participant Malay Gosh in the 28th Annual Morris Hansen Lecture, Washington D.C. 2019.

Invited Speaker for Simposio Nacional de Estadística. Bucaramanga, Colombia. 2019.

Plenary speaker for workshop on completeness in vital statistics. 2018, Bogotá. Colombia.

Invited participant to the regional meeting of UNFPA, for workshop on Bayesian population projections. 2018, Puebla. Mexico.

Oral presentation for Simposio de Estadística 2018, Colombia.

Poster presentation at Bayesian Young Statistician Meeting 2018, Coventry, UK.

Oral presentation for ISBA 2018 World Meeting. International Society for Bayesian Analysis. 2018, Edinburgh. Scotland.

Invited Seminar at Universidade Federal do Rio de Janeiro. Brazil. 2018.

Oral presentation YRM May 2017. Department of Statistics. 2017, University of Warwick. United Kingdom.

Poster presentation at Latin American Bayesian Meeting. 2017. Guanajuato, Mexico.

Poster presentation for ISBA 2016 World Meeting. International Society for Bayesian

Analysis. 2016, Sardinia. Italy.

Invited Seminar at Statistics Department, National University of Colombia. 2015, Medellin, Campus. Colombia.

Poster presentation at Latin American Bayesian Meeting. 2015, Medellin. Colombia.

Oral presentation for Young researcher's meeting, Department of Statistics, University of Warwick. 2014 England. United Kingdom.

Oral presentation for Joint Statistical Meetings. 2012, San Diego. California

Poster presentation at Bayesian Non-parametric meeting. 2011, Veracruz. Mexico.

Oral presentation for VII meeting in data science. 2011, Santo Domingo. Republica Dominicana.

Invited Seminar at University of Puerto Rico. Department of Mathematics. 2011, San Juan. Puerto Rico

Poster presentation at International 2009 Bayesian Objective Conference. Wharton School (University of Pennsylvania). 2009, Philadelphia

Poster presentation at Bayesian Biostatistics Conference. The University of Texas and M.D. Anderson Cancer Center. 2008, Houston, Texas.

Invited Speaker for Joint Statistical Meetings. 2008, Denver. Colorado.

Poster presentation for Bayesian Biostatistics Conference. The University of Texas and M.D. Anderson Cancer Center. 2007, Houston, Texas.

Poster presentation for Ninth Case Studies in Bayesian Statistics. Workshop at Carnegie Mellon University. 2007, Pittsburgh, Pennsylvania.

GRANT SUPPORT

Grants Research. University of Puerto Rico, Business School (2010 and 2012). Objective Bayesian Methods for Survey Sampling Designs - Flexible Bayesian Dynamic Models for Economic Time Series. \$20,000. Role: PI.

COMPUTER SKILLS

Proficient in R and C++.

Experience with SAS, SPSS programming, Rcpp and R package development.

Experience with OpenMP parallelization of C++ programs.

Python. Julia interface with Jupiter Scripts.