Josué Corujo Rodríguez

Contact Information

Institut de Recherche Mathématique Avancée, UMR 7501
Université de Strasbourg et CNRS
7 rue René-Descartes, 67000 Strasbourg, France

@ josue.corujorodriguez@math.unistra.fr

https://josuecorujo.github.io

ORCID 0000-0002-3997-7391.

ArXiv arxiv.org/a/corujo_j_2.html

G scholar scholar.google.com/citations?user=3QdTmnoAAAAJ

Research Interests

Stochastic Processes: Markov processes, interacting particle systems, branching processes, long time convergence and mean-field limit, cutoff phenomenon

Quasi-stationary distributions : Moran (or Fleming – Viot) particle systems, convergence to the quasi-stationary distribution (QSD)

Population genetics : coalescent processes, structured populations

Random graphs : random graphs, multiplicative coalescent, random forests

Reliability theory : stochastic orders, aging classes, maintenance processes

Education

2018-2021 **Ph.D. in Mathematics**.
CEREMADE, Université Paris Dauphine, Paris, France
Title: *Multi-allelic Moran models and quasi stationary distributions*
Advisors: Djalil Chafaï (CEREMADE) and Simona Grusea (INSA-T)

2015-2017 **MSc in Mathematics – Probability and Statistics**.
Universidad de La Habana, Havana, Cuba
MSc Thesis: *Stochastic Comparisons between Two-Units Reparable Systems*
Advisor: José E. Valdés

2011-2015 **BSc in Mathematics**.
Universidad de La Habana, Havana, Cuba
BSc Thesis: *Analysis of Reparable Systems using Stochastic Orders and Aging Classes*
Advisor: José E. Valdés

Academic Appointments

2021– **Postdoc with Vlada Limic**
IRMA, Université de Strasbourg, Strasbourg, France

2018-2021 **Graduate Teaching Assistant**
Génie Mathématique et Modélisation, INSA-T, Toulouse, France

2017–2018 **Assistant Professor**
Universidad de La Habana, Havana, Cuba

2015–2017 **Junior Professor**
Universidad de La Habana, Havana, Cuba

Articles and preprints

Publications in peer reviewed journals

2023 J. Corujo, *On the spectrum and ergodicity of a neutral multi-allelic Moran model*
ALEA **20** (2023), 505–546
arXiv: 2010.08809 | HAL-02969874 | DOI: 10.30757/ALEA.v20-18

J. Corujo, D. Flores-Peñaloza, C. Huemer, P. Pérez-Lantero, and C. Seara, *Matching random colored points with rectangles*, J. Comb. Optim. 45:81, (2023). [1]
DOI: 10.1007/s10878-023-01010-z

2022 Cloez, B. and **Corujo, J.**
Uniform in time propagation of chaos for a Moran model
Stochastic Process. Appl. **154** (2022) 251-285.
arXiv: 2107.10794 | HAL-03345583 | DOI: 10.1016/j.spa.2022.09.006

2021 **Corujo, J.**
Dynamics of a Fleming – Viot type particle system on the cycle graph
Stochastic Process. Appl. **136** (2021), 57–91.
arXiv: 2001.08000 | HAL-02447747 | DOI: 10.1016/j.spa.2021.02.001

Corujo, J. and Valdés, J. E.
Further results on stochastic orderings and aging classes in systems with age replacement
Probab. Eng. Inf. Sci. (2021), 1–30.
HAL | DOI: 10.1017/S0269964821000036

2018 **Corujo, J.**, Valdés, J. E. and Laria, J. C.
Stochastic Comparisons of Two-Units Markovian Repairable Systems
Commun. Stat. - Theory Methods **48** (2019), no. 23, 5820–5838.
arXiv: 1804.03098 | DOI: 10.1080/03610926.2018.1522349

Rodríguez, W., Mazet, O., Grusea, S., Arredondo, A., **Corujo, J.**, Boitard, S. and Chikhi, L.
The IICR and the non-stationary structured coalescent: towards demographic inference with arbitrary changes in population structure
Heredity **116** (2016), 362–371.
HAL-02347366 | DOI: 10.1038/s41437-018-0148-0

[1] A preliminary version of this work appeared in WALCOM 2020, 14th International Conference and Workshop on Algorithms and Computation, Singapore.

Publications in peer reviewed conferences

2020 **Corujo, J.**, Flores-Peñaloza, D., Huemer, C., Pérez-Lantero, P. and Seara, C. *Matching Random Colored Points with Rectangles*, In: Rahman M., Sadakane K., Sung WK. (eds) WALCOM: Algorithms and Computation. WALCOM 2020. Lecture Notes in Computer Science, vol 12049. Springer, Cham. DOI:10/gzm6

Scientific Communications

June 2023 Invited speaker for the session *Quasi-stationary distributions in numerical stochastic methods and statistics* in the 21st INFORMS Applied Probability Society Conference, IECL, Nancy, France
Talk: *Convergence of the empirical measure induced by a Moran type particle system*

April 2023 Seminar Mathématiques pour la Biologie, Institut de Mathématiques de Toulouse, France.
Talk: *Large population limits for a mutation-selection Moran model*

Oct. 2022 Séminaire de Probabilités y Statistique, IECL, Nancy, France
Talk: *A dynamical approach to spanning and surplus edges of random graphs*

Oct. 2022 ITI IRMIA++ Day, Strasbourg, France
Talk: *Some recent advances in the multiplicative coalescent and near-critical random graphs*

Oct. 2022 Journées Math Bio Santé 2022, Besançon, France
Poster: *IICR of structured populations with size change: strong and weak migration*

May 2022 Summer School Mathematics of Large Networks, Budapest, Hungary

April 2022 Recent progress in probabilistic modelling of population genetics
Royal Statistical Society, UK
Talk: Spectrum and ergodicity of a neutral multi-allelic Moran model

April 2022 Séminaire (de calcul) stochastique de Strasbourg, Strasbourg
Présentation orale : A neutral multi-allelic Moran model: spectral elements and cutoff

Mar. 2022 Worskshop ANR QuAMProcs, Inria Paris, France
Talk: Speed of convergence to the mean-field limit for a mutation-selection particle system

Dec. 2021 GDR MAMOVI 2021, École polytechnique, France
Talk: *Propagation of chaos for a multi-allelic Moran model*

Jun. 2021 Seminario de Probabilità, Analisi Stocastica e Statistica, Università di Pisa, Italy
Talk: Spectrum and ergodicity of a neutral Moran model

Feb. 2021 Journée de doctorants en Probabilités, Institut de Mathématiques de Toulouse, France
Talk: *Spectrum of the neutral Moran model and its long time behaviour*

Dec. 2020	Séminaire de Probabilité, Institut de Mathématiques de Toulouse, France Talk: *On the spectrum of a neutral multi-allelic Moran model.*
Nov. 2020	Séminaire de Probabilité et Statistique, Montpellier, France Talk: *Spectral properties of a neutral multi-allelic Moran model*
Mar. 2020	14th International Conference on Operations Research, Havana, Cuba Talk: *Convergence of a Fleming–Viot type particle system on the cycle graph.*
Feb. 2020	Séminaire "Mathématiques pour la Biologie", Institut de Mathématiques de Toulouse, France Talk: *On a multi-allelic Moran type model with mutation matrix corresponding to a cycle graph*
Feb. 2020	Research school "EDP et probabilité pour la biologie" CIRM, Marseille, France Poster: *Quantitative results on a multi-allelic Moran type model with mutation*
Dec. 2019	Workshop on Models and Inference in Population Genetics, Warwick, UK. Poster: *Quantitative results on a multi-allelic Moran type model with mutation*
Nov. 2019	Journée des doctorant.e.s et post-doc, Institut de Mathématiques de Toulouse, France Talk: *Quantitative results on a multi-allelic Moran type model with mutation*
Sep. 2019	GDR MAMOVI 2019, Université de Tours, France Talk: *Quantitative results for a Moran type particle process in the cycle graph*
Sep. 2019	Journée de rentré, INSA de Toulouse, France Talk: *Quantitative results for a Fleming-Viot type particle process in the cycle graph*
Jul. 2019	Summer school "Data and Models in Ecology and Evolution", Institut Pascal, Université Paris-Saclay, France Talk: *Quantitative results for a Moran type particle process in the cycle graph*
Feb. 2019	Master Course from Cooperation project in Mathematics France – Cuba (lectures by Miraine Dávila Felipe) *Universidad de La Habana, Cuba* Title : "Stochastic processes applied to Biology"
Jul. 2017	10th International Conference on Mathematical Methods in Reliability, Grenoble, France Talk: *Stochastic Comparisons of Two-Units Markovian Reparable Systems*

Honor and Awards

2022	***Prix solennels de thèse***, from *La Chancellerie des Universités de Paris*
2021	*Postdoctoral Fellowship* funded the Labex IRMIA, Strasbourg, France
2015	*Scientific Merit Award* from the Rector of the Universidad de La Habana
2015	*Graduated Summa Cum Laude in Mathematics* from Universidad de La Habana

Computational Skills

MATLAB, R, Python, Wolfram Mathematica, Maple, LaTeX, git

Languages

Spanish	Native Language
English	Professional Proficiency
French	Professional Proficiency