europass

PERSONAL INFORMATION   Carlos Alejandro Fernández Sanz

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Sex Male | Date of birth 23/11/1989 | Nationality Cuban

PROFESSIONAL FIELD   Mathematics, Computer Science

WORK EXPERIENCE

June 2023-present

Post-doc researcher

Télécom Paris (www.**Telecom Paris**.com). Member of the S2A group at the LTCI lab
- Anomaly detection on Markov chains
- Statistical depth functions
- MV-Sets

Sector Higher education

March 2018-present

Lead software developer

Fonoma (www.**fonoma**.com)
- Team lead for the development team (backend, frontend and mobile-app)
- Backend development: Dockerized Fast API app running on Google Cloud
- Frontend development: AngularJS and ReactJS (using NextJS)
- Code review
- Control of release and devOps
- Hiring

Sector Informatics

June 2016-March 2018

Software developer

Fonoma (www.**fonoma**.com)
- Backend development: Google AppEngine (Python)
- Frontend development: AngularJS

Sector Informatics

December 2015-October 2019

Junior researcher

Department of Statistics at ICIMAF (Institute of Cybernetics, Mathematics and Physics) (www.**icimaf**.cu)
- Investigation in Data Science, Markov Chains and Queuing Theory

Sector Scientific Research

September 2013-June 2016

Independent Software developer

Free lance
- Website and applications development for different clients. Examples are in the projects section.

Sector Informatics

September 2013-October 2014

Lecturer

José Antonio Echeverría Higher Polytechnic Institute , (ISPJAE) (cujae.**edu**.cu)

- Teacher of Mathematics III, Probabilities and Statistics.
- Confection of lectures and exams.

Sector Higher education

February 2011-July 2014

Manager of the Image Bank

Excelencias Group (www.**excelencias**.com)

- Organization and selection of images to be published in all Excelencias Group medias (5 magazines and more than 10 newsletters).
- Management of the image classifiers.
- Member of the editorial board

Sector Media

March 2009-February 2011

Image classifier

Grupo Excelencias (www.**excelencias**.com)

- Classification, edition and selection for the Excelencias Group Image Bank.

Sector Media

EDUCATION AND TRAINING

October 2019-June 2023

PhD in Mathematics   ISCED-8

Université Paris-Nanterre

Tutors: Dr. Patrice Bertail and Dr. Cecile Durot.

- Bootstrap methods.
- Null-recurrent Markov Chains.
- Tail-index estimations.
- Stochastic process.

From 2020 to 2023, I taught Bayesian Statistics and Inference Statistics to Master students (64 hours per year).

September 2014-June 2016

Master in Mathematics   ISCED-7

University of Havana

Tutor: Dr. Rita Roldán Inguanzo.

- Number Theory (analytic and algebraic)
- Category Theory.
- Module Theory
- Stochastics process
- Stochastics models
- Generalized functions
- Ring Theory
- Geometric Theory of Complex functions
- Galois Theory
- Meta-analysis
- Markov chains
- Probabilities theory
- Group theory
- Complex measures

September 2009-July 2013	**Bachelor in Mathematics**	ISCED-6

University of Havana

Graduated summa cum laude with Golden Title. GPA of 5.76 (5.00 over 5 and +0.76 of bonus). Highest GPA of the graduation.

Tutor: Dr. Rita Roldán Inguanzo.

- Linear algebra
- Abstract algebra
- Mathematical Analysis.
- Functional analysis
- Topology
- Analytic Geometry
- Differential Geometry
- Probabilities
- Statistics
- Stochastic process
- Linear Optimization

From 2010 to 2013 I was assistant student in Analytic Geometry.

PERSONAL SKILLS

Mother tongue(s)   Spanish

Other language(s)

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	C2	C2	C2	C2	C2
French	A1	A2	A1	A1	A1

Levels: A1/2: Basic user - B1/2: Independent user - C1/2 Proficient user
Common European Framework of Reference for Languages

Communication skills
- Good communication skills (both speaking and writing) acquired during my experience as a teacher.
- Skill in the work with younger people developed as part of my teaching experience.

Organizational / managerial skills
- Project management (acquired through the development of software projects).
- Event's organization (acquired through the co-organization of the *Statistics meeting Cuba-Mexico* since 2016).
- Leadership (3 years running Excelencias Group Image Bank and 5 years as lead developer at fonoma's).
- Team work (acquired during the development of several projects).

Computer skills
- Programming in Python (including numpy, scipy and pymc3), C#, JavaScript (including TypeScript, AngularJS and React), MATLab, R and LaTex.
- Development on Google Cloud.
- Development with NextJS
- Development of websites in Django, ASP:Net Web Api and FastAPI
- Basic knowledge of informatics networks
- Experience with software for storing and sorting images (Picasa, ACDSee, Adobe Bridge).

ADDITIONAL INFORMATION

Publications	▪ Carlos A. Fernández, Stephan Clémençon, Anomaly Detection based on Markov Data: A Statistical Depth Approach, Submitted to NeurIPS (2024) ▪ Cécile Durot, Patrice Bertail, and Carlos A. Fernández Sanz, Harris recurrent markov chains and nonlinear monotone cointegrated models, Preprint (2024) ▪ Patrice Bertail, Stephan Clémençon, Carlos A. Fernández Sanz, Tail index estimation for discrete heavy-tailed distributions with application to statistical inference for regular markov chains, Preprint (2024) ▪ Carlos A. Fernández, Regenerative bootstrap for β-null recurrent markov chains, Submitted to Electronic Journal of Statistics, (2024) ▪ Carlos A. Fernández, *Estimation problems on beta-null recurrent time series*, PhD Thesis, Université Paris-Nanterre, (2023) ▪ Yoel G. Yera, Carlos A. Fernández & José E. Valdés, A variant of the Geo/G/1 queues with disasters and general repair times, Communications in Statistics - Theory and Methods, DOI: 10.1080/03610926.2018.1528368 (2018) ▪ Carlos A. Fernández, *Cantidad de soluciones no triviales de Ecuaciones Diagonales sobre Cuerpos Finitas*, Master's degree Thesis, University of Havana, (2016) ▪ Carlos A. Fernández, Rita Roldán Inguanzo, *Una visión algebraica de las Sumas de Gauss y Jacobi*, Proceedings of International Congress COMPUMAT 2013 ISBN 978-959-286-022-3, (2013). ▪ Carlos A. Fernández, *Una visión algebraica de las Sumas de Gauss y Jacobi*, Diploma Thesis, University of Havana (2013).
Presentations	▪ *Estimation of monotone functions in the space of Harris recurrent Markov chains.* Doctoriales, Nanterre (2023). ▪ *Harris recurrent Markov chains and nonlinear monotone cointegrated models.* Non-stationarity, cyclostationarity and applications (2023) ▪ *Regenerative Block Bootstrap on beta null recurrent Markov Chains.* Elements Conference (2022). ▪ *Bootstrap on beta null recurrent Markov Chains.* International Symposium on Nonparametric Statistics (2022). ▪ *Non hyperbolicity of limit hyperbolic random graphs.* XXVIII Statistics meeting Cuba-Mexico. ICIMAF-Universidad Nacional Autónoma de México (2018). ▪ *Geo/G/1 queues with disasters and general repair times.* XXVII Statistics meeting Cuba-Mexico. ICIMAF-Universidad Nacional Autónoma de México (2017). ▪ *Non trivial solutions of diagonal equations over finite fields.* ICIMAF's Scientific Fair (2017). ▪ *Mean Tree.* XXVI Statistics meeting Cuba-Mexico. ICIMAF-Universidad Nacional Autónoma de México (2016). ▪ Presentation of the main results of my diploma tesis *Una visión algebraica de las Sumas de Gauss y Jacobi* in COMPUMAT 2013. ▪ *Sumas de Gauss y Jacobi.* Science Fair. Faculty of Mathematics and Computer Science. University of Havana, (2013) ▪ *Uso del Teorema de la Función Implícita para obtener desarrollos asintóticos.* Science Fair. Faculty of Mathematics and Computer Science. University of Havana, (2010)
Projects	▪ *Statistics meeting Cuba-Mexico*: Co organizer of the XXVI, XXVII, XXVIII, XXXIX editions. In charge of session's organization and other logistical issues. The event is an annual meeting between statisticians from several countries (it started with Cuban and Mexicans but now includes colleges from several countries). ▪ **www.buenviajeacuba.com** Project manager, responsible for integration between the different modules. Developer of the image module. In charge of the public relationships and frontend development. The idea of this project was to develop a web platform for *BuanViaje a Cuba Magazine* (several news blogs and an image blog). It includes and administration module (January 2015-May 2015). ▪ **www.frifarma.com.do** Project manager. Frontend developer. In charge of public relationships, budget control, hiring photographers, designers and translators. In charge of integration between the different modules. Responsible for deploying. This project consisted in the development a corporative website for the pharmaceutical Company *FriFarma S.R.L.* It includes a database with all the products the Company offers and also a module for the presentation of news and events. It was developed in *Django* (December 2014-May 2015). ▪ **BuenViaje a Cuba newsletter**. Project manager. In charge of public relationships. Developer of the email sending module. Responsible for deploying. The project consisted in a web application for creating and sending newsletters. It included the design of several email marketing and a module for RSS (December 2014-January 2015). ▪ **Cuba Contemporánea Magazine Organizer**. Project manager. In charge of public

relationships. Web system developed in Python to control and organize the contents published in *Cuba Contemporánea*'s magazine. (March 2013-January 2014).

▪ ***Metaheuristic for the binary Knapsack Problem.*** In charge of design and implementation of the algorithm. This project consisted in the implementation of the Simulated annealing algorithm to obtain approximated solutions of the binary knapsack problem (April 2012).

Honors and awards

▪ **Honorable Mention of the Scientific Council** of the Faculty of Mathematics and Computer Science. University of Havana (2013).
▪ **First Award** in *Science Fair* (2013).
▪ **Bronze medal** in *XII National Olympic of University Mathematics* (Level I) (2013).
▪ **First Award** in *Honors Exam of Numerical Methods* (2012).
▪ **Silver medal** in *XII National Olympic of University Mathematics* (Level I) (2013).
▪ **First Award** in *Honors Exam of Probabilities Theory* (2011).
▪ **First Award** in *Honors Exam of Abstract Algebra* (2011).
▪ **First Award** in *Honors Exam of Mathematical Analysis IV* (2011).
▪ **First Award** in *Honors Exam of Mathematical Analysis III* (2011).
▪ **First Award** in *Honors Exam of Problem Solving seminar* (2010).
▪ **First Award** in *Honors Exam of Linear Algebra II* (2010).
▪ **First Award** in *Honors Exam of Linear Algebra I* (2010).
▪ **First Award** in *Honors Exam of Analytic Geometry* (2010).
▪ **First Award** in *Science Fair* (2010).