

GUILLERMO NAVAS PALENCIA

PERSONAL INFORMATION

Born in Barcelona, Spain, 25 July 1989

address Madrid, Spain

email g.navas.palencia@gmail.com

phone (+34) 616370912

Website <http://gnpalencia.org/>

EDUCATION

09/2015–07/2019 Universitat Politècnica de Catalunya, Barcelona

Doctor of Philosophy in Computing Computational Mathematics and Number Theory.
Thesis: *High-precision computation of uniform asymptotic expansions for special functions.*
Honors: Excellent Cum Laude. Advisor: Prof. Argimiro ARRATIA.

05/2017–06/2017 Universidad de Cantabria, Santander

Visiting PhD Researcher Hosts: Prof. Javier SEGURA and Prof. Amparo GIL

09/2014–01/2016 Universitat Politècnica de Catalunya, Barcelona

Master's degree in Statistics and Operations Research Mathematical optimization specialization.
Thesis: *Portfolio Credit Risk: Models and Numerical Methods.*
Advisor: Prof. Argimiro ARRATIA
Url: upcommons.upc.edu/bitstream/handle/2117/82265/memoria.pdf

10/2012–07/2013 Universitat Politècnica de Catalunya, Barcelona

Postgraduate in Financial Mathematics Main topics: Numerical methods for Finance, asset management and quantitative risk management.

09/2008–07/2012 Universitat Politècnica de Catalunya, Barcelona

Bachelor's degree in Mechanical Engineering EUETIB-UPC
Thesis: *Design of a plastic bi-material injection mould with metallic inserts.*

WORK EXPERIENCE

07/2021–present Principal Quantitative Analyst Madrid

DBRS Morningstar

04/2021–06/2021 Senior data scientist Madrid

Aplazame Research and development in credit risk and fraud modelling.

11/2017–03/2021 Manager data scientist Madrid

BBVA Lead quantitative researcher/developer in Global Risk Management (GRM). Research in mathematical optimization and statistical modelling.

- Team leader of 6 data scientists. Responsible for hiring and mentoring technical staff.
- Creator and lead developer (Python/Spark/C++) of the GRMLab library, the new BBVA analytical framework for credit risk modelling. Presented to CEO Onur Genç.
 - Achievements: development of robust and accurate credit risk models in minutes.
- Development of new algorithms and methodologies for IFRS9 risk parameters calibration (PD/LGD/EAD). Development of mathematical programming formulation for segmentation/calibration and binning.
 - Achievements: 99% reduction in CPU times and up to 50% increase in prediction.
- Promoted from Senior Quantitative Analyst in 08/2020.
- Promoted from Quantitative analyst in 09/2018.

10/2020–present Associate professor Madrid

University of Navarra Master in Big Data Science. Teaching Python and Machine Learning.

<i>Numerical Algorithms Group (NAG)</i>	11/2015–02/2017 Numerical Software Developer	Oxford
	Developer in mathematical optimization. Development of new solvers for the optimization chapter of the NAG Library. Design and implementation of the new interior-point solver (<code>nag_opt_handle_solve_lp_ipm (e04mtc)</code>) in Matlab and Fortran 90. Technical support and consultancy services in Finance. Development of technical reports.	
<i>Moody's Investors Service</i>	06/2013–05/2014 Associate	Frankfurt
	Developer in Excel VBA/SQL/C#, SFG Technology team. Credit risk modelling, development of VBA tools for CMBS and RMBS team. Development of new reports and data analysis tools with SQL Server.	
<i>SEAT, S.A.</i>	06/2011–05/2013 Several positions	Martorell, Barcelona
	Excel VBA/VB 6.0/Access developer. Development and automation of several internal analytic tools. Development of application to improve reporting tasks.	

COMPUTER SKILLS

<i>Basic</i>	AWK, C, JULIA and R
<i>Intermediate</i>	C++ and SQL
<i>Advanced</i>	PYTHON and FORTRAN 90
<i>O.S.</i>	Linux, Cygwin, Windows 7/8/10
<i>Optimization</i>	AMPL, GOOGLE OR-TOOLS, MIPCL, CPLEX and GUROBI

PROJECTS

1. **OptBinning:** OptBinning is a library written in Python implementing a rigorous and flexible mathematical programming formulation to solving the optimal binning problem for a binary, continuous and multiclass target type. Github: <https://github.com/guillermo-navas-palencia/optbinning>. Web: <http://gnpalencia.org/optbinning/>.
2. **CPrior:** Python/C++ library to perform fast Bayesian A/B and multivariate testing. CPrior supports several conjugate prior distributions, implementing many closed-forms in terms of special functions to obtain high performance. Github: <https://github.com/guillermo-navas-palencia/cprior>. Web: <http://gnpalencia.org/cprior/>.
3. **GNSTLIB:** Numerical library written in C++11 for fast and accurate computation of special functions in double precision floating-point arithmetic.

PUBLICATIONS AND TECHNICAL REPORTS

1. G. Navas-Palencia. *Optimal Counterfactual Explanations for Scorecard Modeling*. Submitted, (2021).
2. G. Navas-Palencia. *Optimal binning: mathematical programming formulation*. Submitted, (2020).
3. G. Navas-Palencia. *Numerical methods and arbitrary-precision computation of the Lerch transcendent*. Submitted, (2019).
4. G. Navas-Palencia. *High-precision evaluation of confluent hypergeometric functions via Franklin-Friedman expansion*. *Advances in Computational Mathematics*, volume 44, Issue 3, pp. 841-859, (2018).

5. G. Navas-Palencia. *Fast and accurate algorithm for the generalized exponential integral $E_\nu(x)$ for positive real order*. Numerical Algorithms, volume 77, Issue 2, pp. 603-630, (2018).
6. G. Navas-Palencia, A. Arratia. *On the computation of confluent hypergeometric functions for large imaginary part of the parameters b and z* . Springer Lectures Notes in Computer Science (LNCS), volume 9725, pp. 241-248, (2016).
7. G. Navas-Palencia. *NAG Technical report - Extending Error Function and related functions to Complex Arguments*. (2016).
8. G. Navas-Palencia. *NAG Technical report - Index-tracking portfolio optimisation model*. (2016).
9. G. Navas-Palencia. *NAG Technical report - Portfolio Credit Risk: Introduction*. (2016).

CONFERENCES, WORKSHOPS AND SEMINARS

1. **31st European Conference on Operational Research**, 11 - 14 July 2021. University of West Attica, Athens, Greece. Talk: *"Mathematical optimization for scoring modelling"*.
2. **PyDay BCN 2019**, 16th November 2019. Universitat de Barcelona, Barcelona, Spain. Talk: *"Fast Bayesian A/B and multivariate testing"*.
3. **FOCM 2017 - Foundations of Computational Mathematics**, 10 - 19 July 2017. Universitat de Barcelona, Barcelona, Spain. Poster: *"Fast and accurate algorithm for the generalized exponential integral $E_\nu(x)$ for positive real order"*.
4. **Barcelona Mathematical Days 2017**, 27 - 28 April 2017. Institut d'Estudis Catalans, Barcelona, Spain.
5. **InFoMM Optimisation Research Sandpit**, 21th September 2016. Mathematical Institute, University of Oxford, United Kingdom.
6. **5th International Congress on Mathematical Software**, 11-14 July 2016. Zuse Institute Berlin (ZIB), Germany. Talk: *"On the computation of confluent hypergeometric function for large imaginary part of the parameters b and z "*.
7. **Global Derivatives Trading & Risk Management**, 9 - 13 May 2016. Budapest, Hungary.
8. **Seminar UPC-UAB of Computational Finance**, 20th January 2016. Invited speaker: *"Portfolio Credit Risk: models and numerical methods"*. Universitat Politècnica de Catalunya, Spain.
9. **Bath/RAL Numerical Analysis Day**, 11th January 2016. Rutherford Appleton Laboratory, Oxford, United Kingdom.
10. **Barcelona Insurance and Risk Management Summer School**, July 2015. University of Barcelona, Spain.
11. **Interdisciplinary Workshop on Quantitative Finance**, June 2015. Centre de Recerca Matemàtica, Spain.
12. **IREA seminar Riskcenter**, March 2015. University of Barcelona, Spain.
13. **Barcelona Mathematical Days 2014**, 7 - 8 November 2014. Institut d'Estudis Catalans, Barcelona, Spain.

AWARDS

Finalist First Global Data Edition 2019 BBVA. Data Challenge Perú, Dec. 2019.
Doctoral thesis Excellent Cum Laude, Oct. 2019.

ACADEMIC SERVICE

Journal Reviewing: ACM Transactions on Mathematical Software.

OTHER INFORMATION

Teaching 2005–2014 · Tutor of math for high school students and college freshman.
Courses Coursera: Machine Learning (Stanford) · GPA: 100%.

Languages Fluent in English, Spanish and Catalan. Elementary in German.

Interests Open-source software · Mathematics reading · Kayaking

July 12, 2021