

GUILLERMO NAVAS PALENCIA

PERSONAL INFORMATION

Born in Barcelona, Spain, 25 July 1989

address Paseo Marqués de Zafra, 41, 28028
Madrid, Spain

email g.navas.palencia@gmail.com

phone (+34) 616370912

Website <http://gnpalencia.org/>

EDUCATION

Doctor of Philosophy in Computing

09/2015–07/2019 Universitat Politècnica de Catalunya, Barcelona
Computational Mathematics and Number Theory.
Thesis: *High-precision computation of uniform asymptotic expansions for special functions.*
Honors: Excellent Cum Laude. Advisor: Prof. Argimiro ARRATIA.

Visiting PhD Researcher

05/2017–06/2017 Universidad de Cantabria, Santander
Hosts: Prof. Javier SEGURA and Prof. Amparo GIL

Master's degree in Statistics and Operations Research

09/2014–01/2016 Universitat Politècnica de Catalunya, Barcelona
Mathematical optimisation specialisation.
Thesis: *Portfolio Credit Risk: Models and Numerical Methods.*
Advisor: Prof. Argimiro ARRATIA
Url: upcommons.upc.edu/bitstream/handle/2117/82265/memoria.pdf

Postgraduate in Financial Mathematics

10/2012–07/2013 Universitat Politècnica de Catalunya, Barcelona
Main topics: Numerical methods for Finance, asset management and quantitative risk management.

Bachelor's degree in Mechanical Engineering

09/2008–07/2012 Universitat Politècnica de Catalunya, Barcelona
EUETIB-UPC
Thesis: *Design of a plastic bi-material injection mould with metallic inserts.*

WORK EXPERIENCE

BBVA

11/2017–present Manager Madrid
Lead quantitative researcher/developer in Global Risk Management (GRM). Research in mathematical optimization and statistical modelling. Team leader of 6 data scientists (BBVA & Everis consulting).

- Development of new algorithms and methodologies for IFRS9 risk parameters calibration (PD/LGD/EAD). Development of mathematical programming formulation for segmentation/calibration and binning.
- 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.
- Promoted from Senior Quantitative Analyst in 08/2020.
- Promoted from Quantitative analyst in 09/2018.

Numerical Algorithms Group (NAG)

11/2015–02/2017 Numerical Software Developer Oxford
Developer in mathematical optimisation. Development of new solvers for the optimisation chapter of the NAG Library. Design and implementation of the new interior-point solver (`nag_opt_handle_solve_ip_ipm (e04mtc)`) in Matlab and Fortran 90. Technical support and consultancy services in Finance. Development of technical reports.

Moody's Investors Service

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.

SEAT, S.A.

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, incorporating constraints not previously addressed. Github: <https://github.com/guillermo-navas-palencia/optbinning>. Web: <http://gnpalencia.org/opbinning/index.html>.
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/index.html>.
3. **GNSTLIB:** Numerical library written in C++11 for fast and accurate computation of special functions in double precision floating-point arithmetic. GNSTLIB can be used as stand-alone C++ library and provides wrappers for the major programming languages used in scientific computing, such as Fortran, C and Python. GNSTLIB is an extension of Chypergeo. Web: <https://sites.google.com/site/guillermonavaspalencia/software/gnstlib>

PUBLICATIONS AND TECHNICAL REPORTS

1. G. Navas-Palencia. *Optimal binning: mathematical programming formulation*. Submitted, (2020)
2. G. Navas-Palencia. *Numerical methods and arbitrary-precision computation of the Lerch transcendent*. Submitted, (2019)
3. 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).
4. 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).
5. 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).
6. G. Navas-Palencia. *NAG Technical report - Extending Error Function and related functions to Complex Arguments*. (2016).

7. G. Navas-Palencia. *NAG Technical report - Index-tracking portfolio optimisation model*. (2016).
8. G. Navas-Palencia. *NAG Technical report - Portfolio Credit Risk: Introduction*. (2016)

CONFERENCES, WORKSHOPS AND SEMINARS

1. **PyDay BCN 2019**, 16th November 2019. Universitat de Barcelona, Barcelona, Spain. Talk: "*Fast Bayesian A/B and multivariate testing*".
2. **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*".
3. **Barcelona Mathematical Days 2017**, 27 - 28 April 2017. Institut d'Estudis Catalans, Barcelona, Spain.
4. **InFoMM Optimisation Research Sandpit**, 21th September 2016. Mathematical Institute, University of Oxford, United Kingdom.
5. **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* ".
6. **Global Derivatives Trading & Risk Management**, 9 - 13 May 2016. Budapest, Hungary.
7. **Seminar UPC-UAB of Computational Finance**, 20th January 2016. Invited speaker: "*Portfolio Credit Risk: models and numerical methods*". Universitat Politècnica de Catalunya, Spain.
8. **Bath/RAL Numerical Analysis Day**, 11th January 2016. Rutherford Appleton Laboratory, Oxford, United Kingdom.
9. **Barcelona Insurance and Risk Management Summer School**, July 2015. University of Barcelona, Spain.
10. **Interdisciplinary Workshop on Quantitative Finance**, June 2015. Centre de Recerca Matemàtica, Spain.
11. **IREA seminar Riskcenter**, March 2015. University of Barcelona, Spain.
12. **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.

OTHER INFORMATION

<i>Teaching</i>	2005–2014 · Tutor of math for high school students and college freshman.
<i>Courses</i>	Coursera: Machine Learning (Stanford) · GPA: 100%.
<i>Languages</i>	SPANISH · Mother tongue CATALAN · Mother tongue ENGLISH · Full professional proficiency GERMAN · Elementary proficiency
<i>Interests</i>	Open-source software · Mathematics reading · Kayaking

August 5, 2020