

César A. Parra Rojas

DATA SCIENTIST · THEORETICAL PHYSICIST

Frankfurt am Main, Germany

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Personal statement

I am a data scientist with a strong analytical and computational background, and experience extracting actionable insights from data. I am comfortable working in diverse, international teams, and skilled at communicating technical concepts to non-technical audiences.

Education

Udacity

MACHINE LEARNING ENGINEER NANODEGREE

2018

[view certificate](#)

The University of Manchester

DOCTOR OF PHILOSOPHY (PHYSICS)

Manchester, UK

2016

Universidad de Chile

M.Sc. PHYSICS

Santiago, Chile

2013

Universidad de Chile

B.Sc. ASTRONOMY

Santiago, Chile

2012

Universidad de Chile

B.Sc. PHYSICS

Santiago, Chile

2010

Work Experience

Pirate Studios Ltd

DATA SCIENTIST

London, UK

Aug 2019

Within the 2019 edition of [Science to Data Science](#), a project-based bootcamp for academics aimed at commercial data science.

- Attended courses on business strategy, finance, economics, project management and commercial insight.
- In an Agile team of three, cleaned and analysed customer relationship management (CRM) data to uncover booking trends and customer behavioural patterns.
- Implemented a personalised measure of customer churn.
- Implemented a churn prediction model and optimised the costs associated with incorrect predictions with potential savings of ca. 20%.
- Directed goals and managed expectations through close contact with stakeholders.

Frankfurt Institute for Advanced Studies

POST-DOCTORAL FELLOW

Frankfurt am Main, Germany

Sep 2017–Dec 2019

- Used mathematical modelling, data analysis and computer simulations to evaluate the within-host impact of influenza vaccination, as well as the within-host and epidemic effects of common antiviral drugs.
- In collaboration with microbiologists, worked with metabolic data and implemented a machine learning model to classify closely-related bacterial genera from soil samples with over 90% accuracy, and identified the most important metabolites involved in the classification.
- Effectively communicated mathematical insights to audiences from a biological background.

The University of Manchester

DOCTORAL STUDENT

Manchester, UK

Sep 2013–Dec 2016

- Worked on the development of a theoretical framework which aimed at understanding the complex macroscopic behaviour of collections of interacting elements described by simple microscopic rules, for the case when this behaviour is observed at discrete time intervals.
- Using tools from nonlinear dynamics and stochastic processes, derived an accurate approximation to the description of disease spread on finite populations of individuals with highly-heterogeneous contact networks while drastically reducing its mathematical complexity.

Universidad de Chile

MASTERS STUDENT

Santiago, Chile

Mar 2011–Mar 2013

- Using theoretical tools from statistical physics, as well as computer simulations, studied the macroscopic effects of small-scale swimming interactions in bacterial suspensions.

- Contributed to Python code aiming at generating an efficient observation plan for a robotic telescope by means of Ant Colony Optimisation and genetic algorithms.

Technical Skills

Programming	Extensive experience with Python, Mathematica. Familiar with MATLAB, FORTRAN, C++, Bash.
Data analysis and visualisation	Advanced NumPy, pandas, Matplotlib, Seaborn. Experience with Plotly.
Databases	Experience with SQL, REST-like APIs.
Machine Learning	Advanced scikit-learn, XGBoost, LightGBM. Experience with SHAP, PyTorch, spaCy, CatBoost, Keras.
Other	Advanced \LaTeX . Experience with Git/GitHub.

Languages

Spanish	Native
English	Fluent
German	Lower intermediate
Polish	Lower intermediate
Portuguese	Lower intermediate

Projects

PDEparams

PYTHON MODULE FOR PARAMETER ESTIMATION IN PARTIAL DIFFERENTIAL EQUATIONS USING THE DIFFERENTIAL EVOLUTION ALGORITHM.

github.com/cparrarojas/PDEparams

sdeparams

PYTHON MODULE FOR PARAMETER ESTIMATION IN STOCHASTIC DIFFERENTIAL EQUATIONS WITH DEMOGRAPHIC NOISE.

github.com/cparrarojas/sde-parameter-estimation

EBOV-2018

INTERACTIVE DASH APP SHOWING PARAMETER ESTIMATION AND EPIDEMIC FORECASTING FOR THE 2018 EBOLA OUTBREAK IN THE DEMOCRATIC REPUBLIC OF CONGO.

cparrarojas.github.io/blog/2018/07/ebov-2018

find-wally

A DEEP LEARNING SOLVER FOR *Where's Wally?* PUZZLES, USING TRANSFER LEARNING WITH THE KERAS IMPLEMENTATION OF RETINANET.

github.com/cparrarojas/find-wally

Leadership

The University of Manchester Chilean Society

CHAIR

Manchester, UK

2015–2016

XI ChileGlobal Seminars UK: Education and Public Policy

CO-ORGANISER

Manchester, UK

May 2015

The University of Manchester Chilean Society

BOARD MEMBER

Manchester, UK

2014–2015

Personal interests

Music

Guitarist, vocalist, songwriter; releasing a progressive rock album as *slq* in 2020. Tenor of the University of Manchester Chorus (2013–2014) and of the School of Science and Engineering Choir of Universidad de Chile (2007–2009).

General

Houseplants, birds, spiders, cycling, cooking. Latest favourite reads: *To the Lighthouse* (V. Woolf), *Invisible Women: Exposing Data Bias in a World Designed for Men* (C. Criado-Perez), *Infinite Jest* (D. Foster Wallace).