

# MIGUEL PEREIRA TORRES DA COSTA

**Current Job:** Software Developer at Oxford Nanolmaging, BioTech

**Education:** First Class Honours BSc and Masters in Mathematics at Oxford University

**Date of Birth:** 25th July 1995

**Nationality:** Portuguese



## SUMMARY

Experienced Data Scientist & Mathematician with a demonstrated history of handling end to end data solutions in fields such as fashion, finance and biotech. Skilled in Analytics, Research, Machine Learning, and Data Mining.

## CONTACT

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**GitHub:** <https://github.com/miguelptcosta>

## SKILLS

●●●● Mathematical Modelling  
●●●○ Machine Learning

●●●○ Python  
●●●○ Docker  
●●●○ Keras / Tensorflow

●●○○ Linux  
●●○○ Git  
●●○○ SQL

## EXPERIENCE

### Mathematician @ Amyris Inc. ( Feb 2021 – December 2021 )

- Solved a long lasting computational bottleneck (calculation time reduced by a factor of  $10e4$  ) by familiarizing myself with the inner workings of State of the Art SAT Solvers, planning the required adaptations for our use case and adding them back to the library Sympy for ease of use without the burden of maintenance: <https://github.com/sympy/sympy/pull/21510>
- Full stack development with React, Django, JWT, Gitlab CI/CD, Pylon's / Pyramid, OpenAPI.
- Duties split between maintenance of large monorepos and extracting features into microservices.

### Founder @ QuestPowered ( Jun 2020 – Dec 2021 )

- Built a forecasting platform over 6 weeks, including KPIs for measuring forecasting ability under random outcomes based on concepts from Information Theory and Measure Theory.
- Self taught Django as a website development platform.
- Setup a custom domain and server for delivering the product.

### Portfolio Risk Analyst @ BlackRock's Financial Modeling Group, Budapest (Sept 2018 – Jun 2020 )

- Expanded a dividend forecast model built for the US Market to 18 other countries, providing near global coverage given the unequal wealth allocation between countries.
- Studied statistical anomalies on live market data under daily deadlines, delivering reports to our clients with full understanding of all data handed over.
- In a team of 5, implemented a novel and experimental risk analysis methodology in a week as part of an hackathon project and presented it to a Regional committee, getting 2nd place in EMEA.

### Teacher @ CamExpress Summer Programme, Shanghai ( Jul 2018 – Aug 2018 )

- Developed lesson plans for classes ranging between 8 and 41 students.
- Prepared assessment materials aimed at ranking the students' performance.
- Was rewarded monetary prizes based on my performance as a teacher and the contribution of new materials

### Data Scientist @ Farfetch, Porto ( Jul 2017 – Dec 2017 )

- Improved the performance of Farfetch's Product Ranking Algorithms, following the team's agile methodology.
- Connected the development cycle from initial business need, to software development, internal testing and user testing.
- Collaborated in the setup of a automatic clothing identifier using Python's Keras package.

### Mathematics Tutoring ( 2017 – Present )

- Students' age range between 10 and 34 years old.
- Swiftly adapted my domain knowledge to the students background in order to make the most of the tutorial sessions.
- More details found at <https://universitytutor.com/tutors/944174>

### Number Theory Researcher @ Oxford University ( Jun 2016 – Jul 2016 )

- Learnt the basics of Elliptic Curves during a 1 week crash course with Dr Jennifer Balakrishnan.
- Adapted algorithms by William A. Stein in order to efficiently populate databases of Elliptic Curves, running these algorithms using Google Cloud while keeping running costs to a minimum.

### Data Scientist Summer Intern at Farfetch, Porto ( Jul 2015 – Aug 2015 )

- Built an internal Fraud Detection System at Farfetch.
- Self taught Machine Learning in Python, R and SQL on the job
- The foundational code was built over the span of a 7 week internship.
- The published results got over 150 citations: <https://doi.org/10.1016/j.dss.2017.01.002>

### Casino Croupier @ Oxford's Raise and Give ( 2014 – 2016 )

- Raise and Give (RAG) is a charity which aims to raise money and donate it to other institutions in greater need.
- I performed quick mental arithmetic in order to split pots appropriately, while maintaining a formal posture during the occasional presence of tipsy players.

## EDUCATION

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### **Integrated Masters in Mathematics @ Oxford University** (October 2013 – June 2016)

First Class Honours ( Parts A/B ) and Upper Second Class ( Part C )

**Subjects taken:** Groups and Group Actions, Linear Algebra, Analysis, Probability, Design and Analysis of Algorithms, Functional Programming (Haskell), Imperative Programming (Scala), Linear Algebra, Differential Equations, Metric Spaces and Complex Analysis, Rings and Modules, Integration, Probability, Topology, Number Theory, Graph Theory, Projective Geometry, Topology and Groups, Algebraic Curves, Algebraic Number Theory, Banach Spaces, Hilbert Spaces, Information Theory, Martingales Through Measure Theory, Continuous Martingales & Stochastic Calculus.

### **High School – Grande Colégio Universal** (October 2005 - June 2013)

Final Grade: 19.2 / 20

## MISCELLANEOUS

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### **Information Pricing Jupyter Notebook**

In the age of KPIs, some of the more humane traits are arguably non measurable, such as affection. Hubbard convincingly argues in his book “How to Measure Anything” that anything can be measured, and a framework for pricing information / new measurements. I've built a Python implementation of his ideas here:

<https://colab.research.google.com/github/migueltorrescosta/tutor/blob/master/ExpectedOpportunityLoss.ipynb>

### **G–Research Algorithmic Trading Competition** ( Nov 2014 )

Developed an high frequency trading algorithm for a simulated stock exchange based exclusively on the order book.

Got 1st Prize

### **LIYSF Participant - London International Youth Science Forum** ( Jul 2014 – Aug 2014 )

Entry fully funded by the Calouste Gulbenkian Foundation, awarded based math Olympiad performance.

LIYSF aims to expose young students to the world of STEM across national barriers and continents.

### **Math Olympian as a member of Delfos Project** ( 2010 – 2013 )

Represented Portugal due to my performance at the National Math Olympiads and Delfos' selection exams. Achieved a total of 3 Bronze Medals, 3 Silver Medals and 2 Gold Medals ( see below )

### **Hands on Particles**

Attended Masterclasses on Particle Physics Organized by the European Particle Physics Outreach Group

## OLYMPIADS

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May 2009 Silver Medal @ **Portuguese National Chemistry Olympiad**

November 2010 Bronze Medal @ **Paulista Math Olympiad ( Portugal & Brazil )**

March 2012 Gold Medal @ **Portuguese National Math Olympiad**

July 2012 Silver Medal @ **Portuguese Speaking Countries Math Olympiad**

November 2012 Silver Medal @ **Paulista Math Olympiad ( Portugal & Brazil )**

March 2013 Bronze Medal @ **Portuguese National Math Olympiad**

August 2013 Gold Medal @ **Portuguese Speaking Countries Math Olympiad**

September 2013 Bronze Medal @ **Ibero-American Math Olympiad**