Miguel Pereira Torres Costa
25 July 1995
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I am interested in writing software using theoretical results
from Stochastic Theory and Machine Learning
while learning more about these two areas

EDUCATION

2013 - 2016 **BS in Mathematics at Oxford University**
First Class Award
1st year: Groups and Group Actions, Linear Algebra, Analysis, Probability, Design and Analysis of Algorithms, Functional Programming (Haskell), Imperative Programming (Scala).
2nd year: Linear Algebra, Differential Equations 1 and 2, Metric Spaces and Complex Analysis, Rings and Modules, Integration, Probability, Topology, Number Theory, Graph Theory and Projective Geometry.
3rd year: Topology and Groups, Algebraic Curves, Algebraic Number Theory, Banach Spaces, Hilbert Spaces, Communication Theory, Martingales Through Measure Theory, Continuous Martingales and Stochastic Calculus.

2005 - 2013 **High School - Grande Colégio Universal**
Physics, Maths, Biology, Chemistry, English, French, Portuguese Literature

WORK EXPERIENCE

Jun - Jul 2016 **Oxford University Research Project**
Elliptic Curves are an essential tool in Cryptography and Number Theory. During this project I use SageMath to populate a database with Elliptic Curves and their properties in order to analyse the asymptotic behavior of certain properties as the height of the elliptic curves increases.

Jul – Sep 2015 **Farfetch**
Summer Internship where I self-taught Machine Learning techniques and applied them to solve a commercial problem. The project I initiated was continued by other employees. I used Python, Microsoft Labs, Microsoft SQL and R. This resulted in a published paper with Nuno Carneiro.

ACADEMIC EXPERIENCE

10th Mar 2012 **Hands on Particles**
Masterclasses on Particle Physics organized by the *European Particle Physics Outreach Group*
Participant

2010 - 2013 **Delfos Project** (Mathematical Weekend School for pre-University students)
Met many friends with whom I still share mathematical insights and interesting problems.
Developed the ability to work on a problem for several hours without losing motivation.

July & August 2014 **London International Youth Science Forum**
Participant - Entry funded as a prize by the Calouste Gulbenkian Foundation.

5th Nov 2014 **G-Research Algorithmic Trading Competition** (Stock Exchange Simulator)
Each team had to write a micro transaction manager algorithm, and then we would all compute live with stock values based on a random real sample
1st Place

June & July 2016 **Computing the Average Rank of Elliptic Curves** (Summer Project at Oxford University)
I used Sage Math and its Elliptic Curve related packages to compute the average Rank of Elliptic Curves under an ordering based on the height of its coefficients. We were trying to observe the rank's asymptotic behaviour and compare it with the Birch and Swinnerton-Dyer conjecture (one of the Millennium Prize Problems).

SKILLS

IT Theoretical basis in Imperative Programming (Scala), Functional Programming (Haskell) and Design and Analysis of Algorithms.
Medium proficiency in Python.
Basic proficiency in C++ and Haskell.

Software Microsoft Office, Open Office, Anaconda & Jupiter Notebooks, Mathematica, SketchUp, R.

Driving License Category B

OLYMPIADS

May 2009	**Portuguese National Chemistry Olympiad** (Silver Medal)
November 2010	**Paulista Math Olympiad** (Portugal and Brazil) (Bronze Medal)
March 2012	**Portuguese National Math Olympiad** (Gold Medal)
July 2012	**Portuguese Speaking Countries Math Olympiad** (Silver Medal)
November 2012	**Paulista Math Olympiad** (Silver Medal)
March 2013	**Portuguese National Math Olympiad** (Bronze Medal)
August 2013	**Portuguese Speaking Countries Math Olympiad** (Gold Medal)
September 2013	**Ibero-American Maths Olympiad** (Bronze Medal)

LANGUAGES

Native/Bilingual Proficiency	**Portuguese** **English**
Professional working Proficiency	**Spanish**
Basic Proficiency	**French**

INTERESTS & ACTIVITIES

Puzzles I enjoy spending hours on riddles. This includes working with Lego, coding problems, developing the optimal strategy for board games, real time strategy PC games, wondering about philosophical paradoxes, amongst others.

Sports Oxford University Handball team 2014-present
Oxford University Quidditch team 2013-2014
College level Football, Basketball and Pool

REFEREES

João Sousa Physics PhD, University of Aveiro (2014)
Data Scientist at Farfetch, Portugal, joao.gomes@farfetch.com

Richard Earl Director of Undergraduate Studies, Mathematical Institute, University of Oxford,
richard.earl@maths.ox.ac.uk
Tutor in Mathematics and Tutor for Admissions, Worcester College, University of Oxford.