Víctor Ballester Ribó

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I am a 4th-year student in Mathematics at Autonomous University of Barcelona. My main interests range from differential equations, dynamical systems and numerical analysis, on the branch of Mathematics, to applied aspects in Physics and Engineering.

Education

M2 in Applied and Theoretical Mathematics — September 2023 - July 2024
Paris Dauphine - PSL University — Paris, France

Bachelor's Degree in Mathematics — September 2019 - July 2023
Autonomous University of Barcelona — Cerdanyola, Spain

- Current GPA: 9.33 / 10.00
- Honors: 150 / 204 ETCS

Baccalaureate — September 2017 - May 2019
La Llauna High School — Badalona, Spain

- GPA: 7.74 / 10.00
- Research project: *Particle physics* (grade: 10.00 / 10.00).
- Achieved a grade of 11.498 / 14.000 in the University entrance exams (PAU).

Experience

HackUPC 2023 — May 12 - May 14, 2023
by Polytechnic University of Catalonia — Barcelona, Spain

- Gained knowledge on the applications of artificial intelligence in the optimization of resources.
- Worked on a project of predicting the values of the stock market and on a project of optimizing the demand of the company HP.

Datathon — June 11 - June 12, 2022
by Aily Labs — Barcelona, Spain

- Gained knowledge on the applications of artificial intelligence in the health sector.
- Worked on a project for the detection of glaucoma in retinal images, using computer vision techniques and CNNs.

Private Tutor — September 2018 - Abril 2023
Self-employed — Badalona, Spain

- Taught Mathematics, Physics and Chemestry to teenage students.

Selected Projects and Reports

Numerical propagation of trajectories of Earth-orbiting spacecraft — January 2023 - Present
Astrophysics, C, C++, Academic Writing — Report | Code

- Reconstruction of orbits of satellites from real initial data when considering the Earth a non-uniform spherical distribution of mass.
- Final Bachelor thesis of the Mathematics's degree at Autonomous University of Barcelona.

- Advised by Josep Maria Mondelo

Notes in Mathematics August 2020 - Present
Mathematics, Academic Writing Website | Code

- Summaries of each subject of the Mathematics's degree at Autonomous University of Barcelona.

Numerical simulation of the n-Body Problem August 2022
Physics, C, Pyhton, Matplotlib Code

- Integrated the n-Body Problem in 2 and 3 dimensions considering the bodies as point masses.
- Developed a program using C for the numerical computation and Python for ploting the results.

AI for Connect-4 game September 2022 - November 2022
Connect 4, C, AI, Minimax Code

- Implemented an artificial intelligence for the classical Connect-4 game using the Minimax algorithm.
- Project conducted as part of the course *Advanced Mathematics* at the Autonomous University of Barcelona.
- Advised by Vicenç Soler.

Measuring musical dissonance April 2021 - June 2021
Mathematical Modeling, C, Music, Academic Writing Report (in Catalan) | Code

- Modeled the dissonance and consonance of musical tones from the point of view of simple tones.
- Developed a program using C to run the model.
- Wrote a report on the development and implementation of the model, and the results of the simulations.
- Project conducted as part of the course *Workshop in Mathematical Modelling* at the Autonomous University of Barcelona, co-authored with Oriol Bosquet and Carlo Sala.
- Advised by Xavier Mora.

Number of spanning trees in a graph and minimum spanning tree January 2021
C, Graphs, Trees, Discrete Mathematics, Academic Writing Report (in Catalan)

- Report on the number of spanning trees in a graph and algorithms for finding the minimum weight spanning tree.
- Project developed as part of the course *Discrete Mathematics* at the Autonomous University of Barcelona, co-authored with Oriol Bosquet, Eric Recio and Carlo Sala.

Classification of Convex Cones May 2020
C, Linear Algebra Source code

- Program that classifies the convex cone generated by input vectors in the 3-dimensional real vector space.
- Project developed as part of the course *Computational Tools for Mathematics* at the Autonomous University of Barcelona.
- Advised by Joaquim Roé.

Skills

Industry knowledge Programming | Mathematical Modeling | Numerical Analysis

Programming Languages C | C++ | Python | Maple | LaTeX | MATLAB | Octave | Java | Bash | R | HTML | CSS | JS | SQL

Libraries and Frameworks	Numpy | Matplotlib | Pandas | PyTorch
Tools and Platforms	VSCode | Jupyter Notebook | Git | SageMath
Soft Skills and Others	Resourceful | Innovative | Curious | Committed | Persistent | Competitive | Ambitious | Open-minded | Responsible | Problem Solving

Languages

English	Advanced (Level C1)
French	Intermediate (level B1)
German	Intermediate (level B1)
Spanish	Native
Catalan	Native

Awards and Achievements

Master scholarship from Paris Graduate School of Mathematical Sciences April 2023
Fondation Sciences Mathématiques de Paris Paris, France

- Scholarship that covers tuition fees and provides a monthly stipend of 1100€ for the M2 Applied and Theoretical Mathematics program at Dauphine-PSL University.

Second best Spanish individual Simon Marais Competition November 2022
Simon Marais Barcelona, Spain

- Second best qualified Spanish individual and top quartile on the west division of the 2022 Simon Marais Mathematics Competition.

Best Spanish pair Simon Marais Competition November 2021
Simon Marais Barcelona, Spain

- Best qualified Spanish pair on the west division of the 2021 Simon Marais Mathematics Competition, jointly with Misael Malqui.

Silver medal at XXX Spanish Physics Olympiad April 2019
Royal Spanish Society of Physics Salamanca, Spain

- Obtained a Silver medal on the XXX Spanish Physics Olympiad of a total of over 200 participants from all over Spain.
- Previously selected as one of the best Catalonia participants to compete in the Spanish competition.

Honorable mention on Physics June 2019
La Llauna High School

- Distinction awarded based on the outstanding grades obtained in Physics along the high school.

Others

Interests	Cycling | Hiking | Physics | Engineering | General Science | Swimming | Classical music | Car racing
Driving licenses	B