

Andrés Herrera Poyatos

Curriculum Vitae

Personal information

First name: Andrés

Last name: Herrera Poyatos

Date of birth: 9 August 1995

Place of birth: La Zubia, Granada, Spain

Education

2018-Present **MSc in Mathematics and Foundations of Computer Science**,
University of Oxford, Oxford, United Kingdom.

2013-2018 **Double Bachelor's Degree in Mathematics and Computer Science**,
University of Granada, Granada, Spain.

Degree	Average grade (out of 10)	Number of courses with highest honours (out of 38)
Mathematics	9.82	32
Computer Science	9.543	25

- Bachelor thesis: *Numerical semigroups and cyclotomic polynomials*.
Advisor: [Prof. Pedro A. García-Sánchez](#).
Grade: 10 out of 10 (with highest honours).

2009-2013 **Estalmat**, *SAEM Thales*, *University of Granada*, Granada, Spain.

- A project to detect and stimulate the precocious mathematical talent.
- Web: thales.cica.es/estalmat.

2011-2013 **High School**, *IES Trevenque*, La Zubia, Granada, Spain.

- High school grade: with highest honours (top 5 best students of the year).
- Access to university grade: 13.63 out of 14.

Experience in research

○ Initiation to research fellowship

July 2017 – July 2018, *University of Granada*, Spain. Advisor: [Prof. Pedro A. García-Sánchez](#).

- Research in numerical semigroups presentations and their connections with cyclotomic polynomials.
- Contributions to the GAP package `NumericalSgps`, gap-packages.github.io/numericalsgps.

○ Young researcher at 5th Heidelberg Laureate Forum

23 September – 30 September 2017, Heidelberg, Germany. Web: heidelberg-laureate-forum.org.

○ Visiting researcher at Max Planck Institute for Mathematics

19 September – 23 September 2017, Bonn, Germany.

- Collaboration with [Dr. Pieter Moree](#) on cyclotomic polynomials.

○ Reviewer for Journal of Algebra and Its Applications, March 2017.

○ Internship at Max Planck Institute for Mathematics

20 August – 20 September 2016, Bonn, Germany. Advisor: [Dr. Pieter Moree](#).

- Research in evaluating cyclotomic polynomials and its derivatives at roots of unity.
- Applications to cyclotomic numerical semigroups.

○ Research training contract on metaheuristics and software development

October 2015 – July 2016, Fundación General Universidad de Granada - Empresa, *University of Granada*, Spain.
Advisor: [Prof. Francisco Herrera](#).

- Design of algorithms and heuristics to solve timetabling and vehicle scheduling problems.
- Implementation of those algorithms and heuristics in C++.

Publications

Journal publications

- **Cyclotomic polynomials at roots of unity**. Bartłomiej Bzdęga, Andrés Herrera-Poyatos and Pieter Moree. *Acta Arithmetica*, 2018, vol. 184, pp. 215 – 230, [doi:10.4064/aa170112-20-12](https://doi.org/10.4064/aa170112-20-12).
- **A snapshot of image pre-processing for convolutional neural networks: case study of MNIST**. Siham Tabik, Daniel Peralta, Andrés Herrera-Poyatos and Francisco Herrera. *International Journal of Computational Intelligence Systems*, 2017, vol. 10, no. 1, pp. 555 – 568, [doi:10.2991/ijcis.2017.10.1.38](https://doi.org/10.2991/ijcis.2017.10.1.38).

Publications submitted to journal

- **Isolated factorizations and applications: Betti sorted and Betti divisible numerical semigroups.**
Pedro A. García-Sánchez and Andrés Herrera-Poyatos. Submitted to Journal of Algebra and its Applications, [arXiv:1804.00885](#).
- **Coefficients and higher order derivatives of cyclotomic polynomials: old and new.**
Andrés Herrera-Poyatos and Pieter Moree. Submitted to Expositiones Mathematicae, [arXiv:1805.05207](#).

Publications in preparation for journal submission

- **Genetic and Memetic Algorithm with Diversity Equilibrium based on Greedy Diversification.**
Andrés Herrera-Poyatos and Francisco Herrera. A second version is in preparation, [arXiv:1702.03594](#).
- **Cyclotomic exponent sequences of numerical semigroups.**
Alexandru Ciolan, Pedro A. García-Sánchez, Andrés Herrera-Poyatos and Pieter Moree.

Conference contributions

- **A study on Data Preprocessing for Deep Neuronal Networks and its application to Handwriting Digit Recognition** ([Un Estudio sobre el Preprocesamiento para Redes Neuronales Profundas y Aplicación sobre Reconocimiento de Dígitos Manuscritos](#)). Daniel Peralta, Andrés Herrera-Poyatos and Francisco Herrera. 17th Spanish Conference on Artificial Intelligence: 8th Workshop on Data Mining and Applications ([TAMIDA 2016](#)), pp. 867–876.
- **Memetic Algorithm with Diversity Equilibrium based on Greedy Diversification** ([Algoritmo Memético Equilibrado con Diversificación Voraz](#)). Andrés Herrera-Poyatos and Francisco Herrera. 16th Spanish Conference on Artificial Intelligence: 2nd Workshop on Metaheuristics and Evolutionary Algorithms ([JAEM 2015](#)), pp. 219–229.
- **Genetic Algorithm with Greedy Diversification and Equilibrium between Exploration and Exploitation** ([Algoritmo Genético con Diversificación Voraz y Equilibrio entre Exploración y Explotación](#)). Andrés Herrera-Poyatos and Francisco Herrera. 10th Spanish Conference on Metaheuristics, Evolutionary and Bio-inspired Algorithms ([MAEB 2015](#)), pp. 9–18.

Courses

- **LaTeX Workshop**, [Orientamat](#), University of Granada, March 2017. Teacher assistant.
- **R Programming**, Johns Hopkins University, Coursera, 2015.
Grade – 100.0 %. [Verified Statement with Distinction](#).
- **Practical data science and big data: Knime, R, Hadoop and Mahout tools**, International University of Andalucía (UNIA), Baeza, Jaén, Spain, 2014. Grade – 10 out of 10.

Awards

- 2013 Top 10, Access to University Grade, Granada province.
- 2013 Honourable Mention to the Best High School Academic Record in La Zubia, Granada.
- 2013 Qualified for the XLIX Spanish Mathematics Olympiad, National Phase.
- 2013 1st place, XLIX Spanish Mathematics Olympiad, Local Phase in Granada province.
- 2013 4th place, XXIV Spanish Physics Olympiad, Local Phase in Granada province.
- 2012 1st place, II Short Story Competition, "Al borde de lo inconcedible", Villa de la Zubia, Granada.
- 2011 2nd place, I Short Story Competition, "Al borde de lo inconcedible", Villa de la Zubia, Granada.
- 2009 Selected for Estalmat - Andalucía ([description in the education section](#)).
- 2009 Top 5, XXV Thales Mathematics Olympiad for students under 13, Granada province.
Qualified for the regional phase in Andalucía.

Languages

Spanish **Mother-tongue**

English **Cambridge English: Advanced (CAE)**

Obtained on July, 2013.

Interests and activities

- **Research in mathematics and computer science.** Links to [Scholar Google](#) and [Research Gate](#).
- **Seminars and collaboration with other students.** Member and lecturer of LibreIM ([libreim.github.io](#)), a students group dedicated to mathematics and computer science. Seminars: [libreim.github.io/t/seminarios](#).
- **Mathematics and computer science dissemination.** Writer for LibreIM's blog, [libreim.github.io/blog](#).
- **Open source projects**, [github.com/andreshp](#), which range from latex templates and class notes to bash commands and several algorithms implementations.
- **Algorithms competitions.** Participant in Hackerrank's competitions. Profile: [hackerrank.com/andreshp](#).
- **Sports: table tennis.** Highest achievement: winner of the 2nd Spanish Under-10 Team Championship, 2005.