

# Andrés Herrera Poyatos

## Curriculum Vitae

### Personal information

**Fist 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](http://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 at the University of Granada.**

July 2017 – July 2018, Department of Algebra, 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](https://gap-packages.github.io/numericalsgps).

- **Young researcher at the 5th Heidelberg Laureate Forum.**

23 September – 30 September 2017, Heidelberg, Germany. Web: [heidelberg-laureate-forum.org](http://heidelberg-laureate-forum.org).

- **Visiting researcher at the Max Planck Institute for Mathematics.**

19 September – 23 September 2017, Bonn, Germany.

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

- **Reviewer for the Journal of Algebra and Its Applications**, March 2017.

- **Internship at the Max Planck Institute for Mathematics.**

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

- Research on 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

- **Isolated factorizations and their applications in simplicial affine semigroups.** Pedro A. García-Sánchez and Andrés Herrera-Poyatos. To appear in the Journal of Algebra and its Applications, [arXiv:1804.00885](https://arxiv.org/abs/1804.00885).

- **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 a journal

- **Coefficients and higher order derivatives of cyclotomic polynomials: old and new.**  
Andrés Herrera-Poyatos and Pieter Moree. Submitted to Expositiones Mathematicae, [arXiv:1805.05207](https://arxiv.org/abs/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](https://arxiv.org/abs/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

- Teacher assistant at **LaTeX Workshop**, [Orientamat](http://orientamat.org), University of Granada, March 2017.
- **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

- 2018 Award for Academic Excellence in Mathematics (University of Granada).  
Awarded by: [Academia de Ciencias Matemáticas, Físico-Químicas y Naturales de Granada](http://www.academiamatematicas.es).  
Reason: Best academic record in mathematics between the years 2016 and 2018.
- 2013 Top 10, Access to University Grade, province of Granada.
- 2013 Honourable Mention to the Best High School Academic Record in La Zubia, Granada.
- 2013 1st place, local phase of the XLIX Spanish Mathematics Olympiad, province of Granada.  
Qualified for the national phase.
- 2013 4th place, local phase of the XXIV Spanish Physics Olympiad, province of Granada.
- 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, province of Granada.  
Qualified for the regional phase in Andalucía.

### Languages

Spanish **Mother-tongue**

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

*Awarded on July 2013.*

### Interests and activities

- **Research in mathematics and computer science.** Links to [Scholar Google](https://scholar.google.com/citations?user=andreshp) and [Research Gate](https://orcid.org/0000-0001-9486-4466).
- **Seminars and collaboration with other students.** Member and lecturer of LibreIM ([libreim.github.io](https://libreim.github.io)), a group of students interested in maths and computer science. Seminars: [libreim.github.io/t/seminarios](https://libreim.github.io/t/seminarios).
- **Mathematics and computer science dissemination.** Writer for LibreIM's blog, [libreim.github.io/blog](https://libreim.github.io/blog).
- **Open source projects**, [github.com/andreshp](https://github.com/andreshp), which range from latex templates and class notes to bash commands and several algorithms implementations.
- **Sports: table tennis.** Highest achievement: winner of the 2nd Spanish Under-10 Team Championship, 2005.