

# Andrés Herrera Poyatos

## Curriculum Vitae

### Personal information

**Fist name:** Andrés

**Last name:** Herrera Poyatos

**Date of birth:** August 9th, 1995

**Place of birth:** La Zubia, Granada, Spain

### Education

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

Degree	Number of completed courses	Average grade (out of 10)	Number of courses with highest honours
Computer Science	24	9.506	15
Mathematics	24	9.825	21

◦ Bachelor thesis (in preparation): *Numerical semigroups and cyclotomic polynomials.*  
Advisor: [Prof. Pedro A. García-Sánchez](#).

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

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](https://gap-packages.github.io/numericalsgps).

#### ◦ Young researcher at 5th Heidelberg Laureate Forum

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

#### ◦ Visiting researcher at Max Planck Institute for Mathematics

19th – 23th September 2017, Bonn, Germany.  
- Collaboration with [Dr. Pieter Moree](#) in cyclotomic polynomials.

#### ◦ Internship at Max Planck Institute for Mathematics

20th August – 20th 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

Contact me in order to get a copy of any of the following publications.

#### Journal papers

- **Cyclotomic polynomials at roots of unity.** Bartłomiej Bzdęga, Andrés Herrera-Poyatos and Pieter Moree.  
Submitted to Acta Arithmetica, accepted subject to minor revision, [arXiv:1611.06783](https://arxiv.org/abs/1611.06783).
- **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).

#### 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).

- **Higher order derivatives of cyclotomic polynomials: old and new.** Andrés Herrera-Poyatos and Pieter Moree.
- **Isolated factorizations and applications: Betti sorted and Betti divisible numerical semigroups.** Pedro A. García-Sánchez and Andrés Herrera-Poyatos.
- **Exponent sequences of cyclotomic 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

- **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 students with the highest access to university grades in Granada, Spain.
- 2013 Honourable Mention to the Best High School Academic Record in La Zubia, Granada, Spain.
- 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.
- 2011 2nd place - I Short Story Competition, "Al borde de lo inconcedible", Villa de la Zubia.
- 2009 Selected for ESTALMAT - Andalucía.
- 2009 Top 5 in XXV Thales Mathematics Olympiad - Granada (12 – 13 years old).  
Qualified for the regional phase in Andalucía.

## Languages

Spanish **Mother-tongue**

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

*Obtained on July, 2013.*

## Interests and activities

*Topics of interest and some related links.*

- **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](#). Posts:
  - Segment trees and Range minimum query.
  - Teorema de Dini (Dini's theorem).
  - Problemas – Fibonacci GCD (Problems – Fibonacci GCD). Written in collaboration with Mario Román.
  - Algoritmos Genéticos (Genetic Algorithms).
- **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: [www.hackerrank.com/andreshp](#).
- **Sports: table tennis.** Highest achievement: winner of the 2nd Spanish Under-10 Team Championship, 2005.