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

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`.

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 in 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

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.
- **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.

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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.
- **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

- **LaTeX Workshop**, Orientamat, University of Granada, March 2017. Teacher asistant.
- **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

- **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: `hackerrank.com/andreshp`.
- **Sports: table tennis**. Highest achievement: winner of the 2nd Spanish Under-10 Team Championship, 2005.

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