





# Emerson León

Mathematician/ Software Developer

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## EXPERIENCE

### EL CYBORG CHAMÁN | SOFTWARE DEVELOPMENT

June 2022 – July 2023 | Bogotá, Colombia

- Project joint with Tercer Piso Danza, with a grant from Idartes for art, science and technology, where we created workshops, tutorials and a final exposition.
- I created for them a web-page powered with artificial intelligence that generate stories and images from different input, using GPT-3 and Stable Diffusion technology from openAI <https://elcyborgchaman.pythonanywhere.com>
- Skills and tools: web development · arts and science · creativity · python · openAI · flask · django · JavaScript · artificial intelligence · three.js · SQLAlchemy · html · css

### LOS ANDES UNIVERSITY | POSTDOCTORAL RESEARCHER | MATH PROFESSOR

July 2015 – June 2017 | Bogotá, Colombia

- Research in discrete geometry, polytopes, Ehrhart theory, combinatorics
- Teaching: Linear algebra, differential, integral and multivariate calculus, discrete Geometry
- Skills and tools: discrete geometry · computational geometry · teaching · education · linux · web development · html · mathematical modeling · sagemath

### COLOMBIAN MATHEMATICAL OLYMPIAD | ORGANIZING COMMITTEE | TEACHER

Jun 2002 – Dec 2006 | Bogotá, Colombia

- Coorganizer of the yearly math competitions for the whole country
- Helped to prepare talented Colombian children in math problem solving to participate in international competitions
- Skills and tools: math teaching · event organizing · problem solving · design of new math problems · creativity · algebra · number theory · geometry · combinatorics

## EDUCATION

### FREIE UNIVERSITÄT, BERLIN | DOCTOR RER. NAT. MATHEMATICS

Jan 2007 – Feb 2015 | advisor: Günter M. Ziegler

- Research in discrete geometry, mathematical modeling, topological spaces, moduli spaces, multidimensional geometry.
- In the thesis we defined and analyzed a mathematical object that parameterized all possible ways to divide the d-dimensional space into n convex regions.
- Scholarship Phase I and Phase II by Berlin Mathematical School.

### UNIVERSIDAD NACIONAL DE COLOMBIA, BOGOTÁ | BACHELOR'S IN MATHEMATICS

Jul 2001 – Sep 2006

- Tuition reimbursement due to grades on the top 2 each semester.

### OTHER COURSES

- Kaggle: pandas, machine learning (basic, intermediate, explainability)

### VISUALIZATION PROJECTS | PYTHON | JAVASCRIPT | THREE.JS

- Spline surfaces: Some surfaces generated by piecewise polynomial equations for its coordinates. Software experiments for research in spline theory [link](#)
- 3D chip firing: Code that generates three-dimensional chip firing configurations and help to visualize them online, with various customizable parameters [link](#)

## SKILLS

### PROGRAMMING

Proficient:

python · JavaScript · html · css · sagemath · L<sup>A</sup>T<sub>E</sub>X

Familiar:

C++ · matlab · Julia

### LIBRARIES/Frameworks

flask · django · three.js · openAI · pandas · sklearn · matplotlib · pygame · sqlalchemy · node.js · tensorflow · sagemath

### LANGUAGES

Spanish · English · German

## PUBLICATIONS

- Binomial Inequalities of Chromatic, Flow, and Ehrhart Polynomials, with Matthias Beck *Disc. Comp. Geometry*, 2021
- Spaces of Convex n-Partitions *New trends in intuitive Geometry*, 2017
- Combinatorial Relationship Between Finite Fields and Fixed Points of Functions Going Up and Down *preprint*, 2023

## AWARDS

### SILVER+2 BRONZE MEDALS


INTERNATIONAL MATH OLYMPIAD IMO  
Romania 1999 | Korea 2000 | USA 2001

### GOLD MEDAL

IBEROAMERICAN MATH OLYMPIAD  
First place Cuba 1999

## REFERENCES

**Luis Serrano**, AI scientist,  
Serrano Academy

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**Federico Ardila**, Math  
Professor, San Francisco State  
University

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