

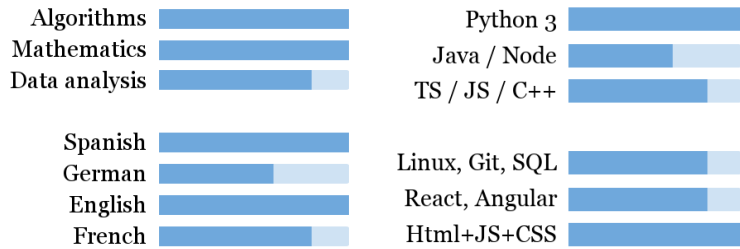


Carlos Pinzón

Mathematician and engineer

Carlos Antonio Pinzón Henao
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Residence: Palaiseau, France
Origin: Bogotá, Colombia



EDUCATION

Jul. 2020 - Today **PhD: Fairness in machine learning (social discrimination in ML)**
École Polytechnique, Inria. (Palaiseau, France)

Jan. 2018 - Sep. 2020 **Master in engineering (computer science):** 4 semesters.
Highest grade, honors and graduation speech.
Pontificia Universidad Javeriana Cali (PUJ Cali).

Aug. 2011 - Dec. 2017 **Bachelor in Mathematics:** 9 semesters.
Highest grade, honors, graduation speech and master scholarship.
Escuela Colombiana de Ingeniería (ECI).

Jan. 2011 - Jul. 2017 **Bachelor in electronics engineering:** 10 semesters.
Highest grade and master scholarship.
Escuela Colombiana de Ingeniería (ECI).

Aug. 2016 - Jul. 2017 **DAAD scholarship:** academic semester and internship semester.
▪ Winter semester 2016 / 2017 at KIT, Karlsruhe, Germany.
▪ Internship as market analyst at ICIS, Karlsruhe.

Languages **Spanish:** Mother tongue.
German: Good but decreasing. Around B2 or B1 nowadays (certificates below).
English: Fluid C1.
French: Good and increasing. Around B2.

WORK EXPERIENCE

Sept. 2020 - Today **Assistant** for programming course CSE 101. École Polytechnique.

Jan. 2018 - May. 2020 **Data analyst and software developer:** Dashboard and backend algorithms.
Centro de excelencia CAOBA (big data center).

Nov. 2018 - Aug. 2019 **App developer using Ionic:** Entrepreneurship *uigo* with three colleagues.

Aug. 2018 - Dec. 2019 **Bsc. Professor of Trees and graphs** with Camilo Rocha. PUJ, Cali.

Jan. 2018 - May. 2018 **Bsc. Professor of linear algebra and algorithms:** 3 groups, 3 subjects.
ALLI (algebra), PIMO (programming II) y ALGO (algorithms). ECI, Bogotá.

Jan. 2017 - Jun. 2017 **Market analyst (intern):** Forecasting of LNG flow in the UK and electricity prices
in Germany using MLearning. ICIS Tschach Solutions, Karlsruhe.

Jan. 2014 - May. 2015 **Assistant** for linear algebra course. Prof. Guiomar Lleras. ECI, Bogotá.

RESEARCH

- Projects
- **Segmentación de imágenes de cultivos** (segmentation of crop images)
With Dr. Javier Chaparro. Image processing of aerial photos of potato crops and path routing for a land robot to visit the plants.
 - **Cardiac data filtering**
With Omar Parra and 3 professors. Algorithms and GUI in Matlab for processing images and data of hearts of lab rats.
- Papers and presentations
- **On the impossibility of non-trivial accuracy in presence of fairness constraints** (fairness, machine learning). Conferences AAAI 202 and PFIA 2022.
 - **Computing aggregate knowledge as the greatest lower bound of knowledge** (posets, discrete math). Conference RAMICS 2021.
 - **Make puzzles great again.** 4 problems and interesting solutions. LNCS.
 - **Algorithmic analysis of blockchain efficiency with communication delay.** Model for blockchain growth using graph theory. Conference FASE 2020.
 - **Espacios ad-compactos** (topology, math) A generalization of compactness.
 - **Double-spend attack models with time advantage for Bitcoin**
Theoretical model for some attacks to the Bitcoin network. Presented at CLEI-2016, Chile. Published in ENTCS.

PERSONAL SKILLS

- Communication skills
- Student representative to the Electronic Engineering Committee at ECI.
 - Teamwork at the university and at programming contests.
 - Writing skills in Spanish and English.
- Programming skills
- Algorithms and special data structures¹.
 - C, C++, Python and Java in programming contests and in the university.
 - Web and server-side programming skills. TS, JS, node and python.
 - Linux background: more than 10 years as primary OS

CERTIFICATES, AWARDS AND MORE

- Language certificates
- **C1 TestDaF.** German, June 2017. 5/5 Hören, 4/5 Sp, 4/5 Sch, 4/5 Le.
 - **B1 Goethe Zertifikat.** German, February 2016. 80 Sp, 96 Sch, 77 Hö, 80 Le.
 - **C1 IELTS.** English, September 2020.
- Coursera certificates
- **Machine learning.** Stanford University. Perfect score, 100%.
 - **Internet Giants: Law and Economics of Media Platforms.** U. of Michigan.
 - **Digital Signal Processing.** École Polytechnique Fédérale de Lausanne.
- Awards
- **Datatón Bancolombia 2019.** Third place (national), with two friends.
 - **Two 100% Master-PhD scholarships.** To be used exclusively at ECI for obtaining the highest grades in electronics and then in mathematics.
 - **Academic excellence scholarship** more than 8 times consecutively at ECI for being among the top 3 students in electronics and then in matemáticas.
 - **Programming contests CCPL** with two friends. Team Eigma Alpha.
 - Third best team in Colombia during 2014 (bronze medal).
 - First place in some contests during 2015 and 2016.
 - Special invitation to visit Google and Microsoft offices in Bogotá.

Palaiseau, July 2022

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¹ Dynamic Programming (expert), MCBM, segment trees, fenwick trees, geometry, graphs, prime numbers, Backtracking, MFP, 2SAT, string search (with suffix arrays, KMP or Rabin Karp algorithms) and hashing