# Gabriel Pereira de Carvalho

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## Education

**Ecole Polytechnique**
MSc in Engineering – Electrical Engineering (*Cycle ingenieur polytechnicien*)

*Palaiseau, France*
*09/2022 – 08/2025*

- **GPA: 3.79/4.00**
- Relevant Coursework: Digital systems FPGA lab, Computer Networking, Machine and Deep Learning, Statistics and learning, Numerical analysis, Algorithms design and analysis, 3D computer graphics, Data analysis in C++, Analog and Digital Circuit Design, Power Electronics for Renewable Energy.

**University of São Paulo**
BSc in Computer Engineering (*joined Ecole polytechnique on a double degree agreement*)

*São Paulo, Brazil*
*01/2019 – present*

- **GPA: 8.6/10.0**
- Relevant Coursework: Digital systems FPGA lab, Microprocessors laboratory, Operating systems, Computer organization and architecture, Systems programming, Electrical circuits, Electronics.
- I have returned from a double degree program at Ecole polytechnique. Currently, I am finishing my Brazilian engineering diploma and I have started working on a master thesis in my University's criptography research lab.

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## Work Experience

**Arm**
CPU Verification Intern

*Sophia-Antipolis, France*
*April 2025 – present*

- End of studies internship for my engineering degree at Ecole polytechnique. Worked on RAG-based assistants for automating verification tasks. I presented proof of concept solutions to two problems: generating configuration files for a constrained-random testbench and automating code documentation using Meta's DocAgent architecture.

**STMicroelectronics**
Digital Design Intern (Summer 2024)

*Crolles, France*
*June–August 2024*

- Worked with VHDL/Verilog and CAD tools (Synopsis Fusion Compiler, Synopsis RTL Architect, Cadence Xcelium).
- Worked on an automated testing feature and timing analysis for a low-power neural processing unit project.
- My project consisted of modifying the state machine for test runs, exporting Python trained models for tests on the VHDL design, testing different memory blocks, working on TCL scripts for logical synthesis and to probe critical signals in gate-level simulations.

**Ada Tech**
Web Development Intern

*São Paulo, Brazil*
*May–Aug 2021 and Jan–Apr 2022*

- Edtech proposing upskilling, reskilling and education recruitement programs to help people enter or pivot in the tech industry.
- On my first internship at Ada Tech, I worked on an online development environment for students to practice and deliver assignments. Over the course of the internship I worked with Next.js and Amazon Web Services such as SQS, Lambda and MQ (MQTT messaging).
- On my second internship at Ada Tech, I collaborated in the development of the company's internal management system as a front-end developer. Over the course of the internship I worked with Next.js and the .NET Framework.

**University of São Paulo**
Teaching assistant – Electrical Circuits I and II

*São Paulo, Brazil*
*Aug 2021 – July 2022*

- Worked on problem sets for recitation sessions with students. Topics included: Laplace transforms, nodal/mesh analysis in the frequency domain, magnetically coupled circuits, Bode plots and four port networks.
- Answered student questions on the Moodle forum.

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## Projects

### Competitive Programming

- Participated in many online programming contests in Codeforces and Codechef on algorithms and data structures.
- Medals in the Brazilian Informatics Olympiad (Silver 2016, Bronze 2017, Gold 2018, Bronze 2019) and participation in the Brazilian team's selection tests for the International Informatics Olympiad IOI 2019.

### Handwritten digit detection on FPGA [https://github.com/ArkhamKnightGPC/PHY473R]

- Project consisting on binary classification of handwritten digits on FPGA based on the MNIST dataset using VHDL. The project was developed on a Altera DE2-115 board and includes interfaces with a VGA monitor, an LCD and a TRDB-DC2 camera.

### Security system based on a rotating ultrasonic sensor and MQTT messaging
[https://github.com/ArkhamKnightGPC/sistema-seguranca]

- Group project for an FPGA lab course at the University of São Paulo developed during the pandemic.

- The project has 3 components: an Altera DE0–CV FPGA at the university lab running the system control unit and dataflow; a ESP 8266 SoC at home that collects data from the sensor and sends it to the FPGA via MQTT; and a graphical user interface made with Processing that allows the user to monitor the FPGA output signals remotely.

**IP Paris Swarm Rescue competition 2023–2024** `[https://github.com/ArkhamKnightGPC/drone-swarm-psc]`

- Group project consisting of a comparative analysis of different approaches to teach a swarm of drones how to behave to save a maximum of injured people in a minimum of time on a simulated environment.
- Worked on randomized exploration algorithms (Lévy flight, RRTs) and communication strategy based on MQTT messaging.
- Ranked 9/43 teams of IP Paris students.

**3D interactive scene of the great pyramids** `[https://github.com/ArkhamKnightGPC/OpenGL_AncientEgyptProject]`

- Group project for a 3D computer graphics class using C++ and the OpenGL library.
- It is a treasure hunting game where the player controls a bird that flies over the site of the Great Pyramids. I worked on the fog effect replicating the sandstorm, the custom camera controller following the bird, the bird model and flying animation, the Perlin noise used for the sand texture and the treasure animation.

**IP Address Tracker** `[https://github.com/ArkhamKnightGPC/RastreadorIP]`

- Web development project made using the *IP Geolocation API*, the *react leaflet* package and *Bulma CSS*.

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## Science olympiads

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| 2020 | **Honorable mention** Brazilian Mathematical Olympiad for University Students |
| 2018 | **Gold Medal** Brazilian Informatics Olympiad |
| 2018 | **Gold Medal** Brazilian Astronomy Olympiad |
| 2018 | **Silver Medal** International Young Physicists Tournament Brazil **IYPT** |
| 2018 | **Silver Medal** Brazilian Mathematics Olympiad for Public Schools |
| 2017 | **Bronze Medal** Brazilian Chemistry Olympiad |
| 2017 | **Honorable mention** Brazilian Physics Olympiad |

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## Language Certifications

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| 2023 | Test de connaissance du français (tout public) – France Education International |
| 2017 | Certificate of Proficiency in English CPE – Cambridge English |