

Arthur Carvalho Guerra

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Education

Master 2 in Interaction, Graphics and Design - IGD Institut Polytechnique de Paris Sept 2025 – present

- **Coursework:** Image Analysis & Computer Vision; Computer Animation; Digital Representation and Analysis of Shapes; Image Synthesis.

MSc in Engineering Télécom Paris Sept 2024 – present

- Double degree exchange program
- **GPA:** 4.0/4.0
- **Coursework:** Interactive 3D Application Development; Fundamentals of Computer Graphics; Continuous optimization and numerical analysis.

BSc in Computer Science Universidade Estadual de Campinas (UNICAMP) Mar 2021 – present

Integrated Technical High School in Informatics CEFET-MG Mar 2018 – Mar 2021

Experience

Fullstack Web Application Developer, MOST Specialist Technologies Jan 2023 – Aug 2024

- Specialized on back-end development using Python (with Flask) and C# (.NET Framework/ASP.NET).
- Developed front-end applications using JavaScript/TypeScript, React.js, and Angular.

Web Developer Intern, Classapp Sept 2021 – Dec 2022

- Developed mobile applications using React Native, focusing on user experience and performance across both iOS and Android platforms.
- Built and maintained web applications using React.js, JavaScript, and TypeScript.

Projects

Reaction–diffusion system simulation

- Implemented the Gray–Scott reaction–diffusion model with both a finite-difference CPU solver and a GPU solver via fragment shader ping-pong, toggleable at runtime to compare performance.
- Built real-time visualization and controls (OpenGL, C++, GLSL shaders), with interactive seeding and an in-app profiler; deepened experience with framebuffers, texture formats and GPU computing.

Interactive Depixelization of Pixel Art — spring simulation vectorizer

- Implementation of a research paper. Converts low-res pixel art into clean, editable SVGs by relaxing contour nodes with an adjustable spring system (smoothness, area preservation).
- Bézier curve fitting for crisp outlines and SVG export; implemented in C++ with OpenCV and OpenGL.

Implementation of the paper Interactive Invigoration (SIGGRAPH 2024)

- Implemented core algorithms from Li et al.'s paper on strand-based volumetric tree modeling in C++.
- Developed collision resolution using Position-Based Dynamics (PBD) for realistic branch geometry.
- Tools Used: C++, OpenGL, GLSL, CGAL, CMake

Extracurricular activities

UNICEF/Samsung Programming Marathon - 1st & 2nd editions 2018 & 2019/20

- Contributed to a mobile application using React Native (JS + NodeJS) to make learning about electricity generation more engaging for high school students.
- Member of a winning team in both the 1st and 2nd editions.

Languages

- **English:** Fluent
- **French:** Intermediate
- **Portuguese:** Native Speaker