

Geovany Batista Polo Laguerre

Applied Mathematics · Modelling and Scientific Computing

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PROFILE

Master's degree in Mathematics and Applications (modelling and decision support). ODE and PDE modelling, numerical analysis and simulation in Python and R, applied to environment and health; teaching mathematics for computer science.

EXPERIENCE

M2 research internship: ultrasound propagation modelling · LAMIA, Université des Antilles

Jan 2026 – May 2026 · Guadeloupe

- Analysis of the Westervelt equation and of quasilinear strongly damped wave models.
- Numerical simulations in Python using operator splitting and finite differences.
- Supervised by Prof. Pascal Pouillet and Prof. Léa Batteux.

Research internship: cyclone flow modelling · MEMIAD

Apr 2025 – Jun 2025 · Martinique

- ODE/PDE-based atmospheric flow models, with asymptotic analysis around the cyclone eye.
- Numerical simulations in Python with a Lax-Friedrichs scheme.
- Supervised by Prof. Maximilian F. Hasler.

Lecturer, Mathematics for Computer Science · Université Quisqueya

Sep 2025 – present

- Teaching the mathematical foundations of computing programs: logic, algebra, calculus and discrete structures.
- Course notes and exercises published on GitHub (Maths-pour-l-Informatique).

Teaching Assistant, Data Science & AI · Université Quisqueya

May 2025 – present

- Hands-on support for Data Science & AI students, in partnership with Akademi and the Flatiron School.
- Code reviews, Q&A sessions and contributions to curriculum refinement.

Mathematics Tutor · Self-employed

Jan 2015 – present

- Long-term support for students from diverse backgrounds: clarifying concepts, exam preparation and structured problem-solving methods.
- Teaching adapted to each student, focused on rigor, autonomy and confidence.

PROJECTS

Simulation chlordercone · github.com/Geobatpo07/simulation-chlordecone

A non-autonomous compartmental ODE model of chlordecone contamination under seasonal rainfall forcing, with a Shiny app to simulate human exposure and intervention strategies. Code accompanying a preprint.

Stack: R, Shiny, Non-autonomous ODEs, renv

Shiny app: fsu5hs-geovany0batista0polo-laguerre.shinyapps.io/chlordecone-simulation-app/

Preprint (DOI): doi.org/10.13140/RG.2.2.36238.01607

Scientific Assistant · github.com/Geobatpo07/scientific-assistant

A local multi-agent system: eight specialized agents (planning, symbolic mathematics, numerical methods, statistics, literature, review, writing, memory) and hybrid vector and keyword RAG. Produces executable Python code and citations.

Stack: Python, LangChain, Ollama, ChromaDB, RAG

Medical Triage System · github.com/Geobatpo07/MedicalTriageSystem

A C++ triage application: a Random Forest model classifies patients into three levels (critical, moderate, low) from their symptoms and risk factors.

Stack: C++, Random Forest, CSV

Character Theory over Finite Fields

Construction of the additive characters of a finite field and their orthogonality relations, with applications in discrete mathematics.

Stack: Group theory, Finite fields, Character theory

Presentation (DOI): doi.org/10.13140/RG.2.2.13837.45285

SKILLS

Mathematics & scientific computing: Statistics & probability, Differential equations (ODE, PDE), Numerical analysis, Finite differences, operator splitting, Compartmental modelling, Symbolic computation

Languages: Python, R, C++

Machine learning & AI: Scikit-learn, Pandas, NumPy, RAG, Multi-agent systems, Local LLMs (Ollama)

EDUCATION

Master's in Mathematics and Applications, MOAD track

Université des Antilles · 2024 – 2026 · Mathematical modelling and decision support tools, environment and health focus

MicroMasters in Statistics and Data Science

MIT (MITx) · 2024 · Methods track

Bachelor's degree in Mathematics

École Normale Supérieure, Université d'État d'Haïti · 2021 – 2022

Civil Engineering degree

Faculté des Sciences, Université d'État d'Haïti · 2017 – 2022

PUBLICATIONS

Modélisation de l'exposition humaine au chlordécone. ResearchGate (Preprint), 2026. DOI: [10.13140/RG.2.2.36238.01607](https://doi.org/10.13140/RG.2.2.36238.01607)

Exploring Finite Fields and Their Character Theory. ResearchGate (Presentation), 2025. DOI: [10.13140/RG.2.2.13837.45285](https://doi.org/10.13140/RG.2.2.13837.45285)

Differential Equation Models for Environmental Risk. In preparation.

Applied Mathematics for Data Science Education. In preparation.

Modern Analytics Engineering for Scientific Workflows. In preparation.

CERTIFICATIONS

Data or Specimen Only Research · Research ethics training for studies involving data or specimens only