

Geovany Batista Polo Laguerre

Applied Mathematician & Data Scientist

Paris, France · lgeobatpo98@gmail.com · geovanylaguerre.net · github.com/Geobatpo07 · linkedin.com/in/geobatpo07 · orcid.org/0009-0008-8722-6411

SUMMARY

I hold a Master's degree in Mathematics and Applications from the Université des Antilles, specializing in Mathematical Modelling and Decision Support Tools with a focus on Environment and Health. My work sits at the intersection of applied mathematics, mathematical modelling, and scientific computing, extending into data science and artificial intelligence in service of environmental and healthcare decision support. Alongside my research, I worked as a Full-Stack Developer & Data Analyst at Solutions S.A. from 2023 to August 2026, and I teach mathematics and data science at Université Quisqueya.

EDUCATION

Master's in Mathematics and Applications, MOAD track <i>Université des Antilles</i> Mathematical modelling and decision support tools, environment and health focus Supervisor: Prof. Pascal Pouillet	Sep 2024 – Jun 2026
MicroMasters in Statistics and Data Science <i>MIT (MITx)</i> Methods track	Jan 2024
Bachelor's degree in Mathematics <i>École Normale Supérieure, Université d'État d'Haïti</i>	Nov 2021 – Jul 2022
Civil Engineering degree <i>Faculté des Sciences, Université d'État d'Haïti</i>	Oct 2017 – Jul 2022

PROFESSIONAL EXPERIENCE

Full-Stack Developer & Data Analyst <i>Solutions S.A., Remote</i> – Analytics architecture on Microsoft Fabric (Lakehouse, Data Warehouse). – Power BI dashboards and KPI tracking; helped raise the share of client sites above 95% performance from about 20% to about 60%. – ETL pipelines and healthcare data quality, including machine-learning-based deduplication. – Mapping with QGIS and Power BI. – SQL Server, MySQL and PostgreSQL databases. – Migrated a legacy PHP application to Java, including data migration and preservation of existing interfaces. – Microservices and REST APIs (Spring Boot, ASP.NET Core), RabbitMQ messaging, Docker containers on Linux, monitoring with Grafana. – Built C# / ASP.NET Core / Blazor applications: SALVH/OpenMRS Management and the RADAR reporting platform. – Worked in a Scrum team on Azure DevOps.	Jul 2023 – Aug 2026
Data Engineer (volunteer) <i>AYITISTATS</i> – Unifying statistical data for a Google Data Commons instance on Google Cloud (GCP).	Aug 2026 – present

RESEARCH EXPERIENCE

M2 research internship: ultrasound propagation modelling <i>LAMIA, Université des Antilles, Guadeloupe</i> – 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.	Jan 2026 – May 2026
Research internship: cyclone flow modelling <i>MEMIAD, Martinique</i> – 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.	Apr 2025 – Jun 2025

Master's Research

Sep 2024 – Jun 2026

Université des Antilles, Department of Mathematics and IT

- Master's research within the Mathematical Modelling and Decision Support Tools specialization, Environment & Health focus.
- Investigate differential equations for mathematical modelling of complex systems.
- Compartmental and non-autonomous ODE systems, applied to environmental contamination.
- Supervised by Prof. Pascal Poulet.

Student Researcher

Oct 2017 – present

Laboratoire de Mathématiques et Applications, Université d'État d'Haïti

- Long-running independent research activity in applied mathematics.
- Explore mathematical modelling and finite field theory questions outside of formal coursework.
- Independent theoretical work, including character theory over finite fields.
- Foundation for the applied mathematics thread running through all later research.

TEACHING

Lecturer, Mathematics for Computer Science

Sep 2025 – present

Université Quisqueya

- 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

May 2025 – present

Université Quisqueya

- 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

Jan 2015 – present

Self-employed

- 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.

SELECTED PROJECTS

DataHut-DuckHouse

A multi-tenant analytics platform, local or cloud: Arrow Flight ingestion, hybrid DuckDB and Iceberg storage (MinIO/S3), dbt transformations and Trino queries.

Python, DuckDB, Apache Iceberg, Arrow Flight, dbt, Trino, MinIO

github.com/Geobatpo07/datahut-duckhouse

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.

Python, LangChain, Ollama, ChromaDB, RAG

github.com/Geobatpo07/scientific-assistant

Simulation chlordercone

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.

R, Shiny, Non-autonomous ODEs, renv

github.com/Geobatpo07/simulation-chlordecone

Medical Triage System

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

C++, Random Forest, CSV

github.com/Geobatpo07/MedicalTriageSystem

PUBLICATIONS

- Geovany B. P., Laguerre (2026). "Modélisation de l'exposition humaine au chlordercone." *ResearchGate Preprint*.
- Geovany B. P., Laguerre (2025). "Exploring Finite Fields and Their Character Theory." *ResearchGate Presentation*.

TECHNICAL EXPERTISE

- **Languages:** C#, Java, Python, TypeScript, SQL, R, C++

- **Mathematics & scientific computing:** Statistics & probability, Differential equations (ODE, PDE), Numerical analysis, Finite differences, operator splitting, Compartmental modelling, Symbolic computation
- **Data engineering:** Microsoft Fabric (Lakehouse, Data Warehouse), ETL, dbt, Apache Iceberg, Trino, Arrow Flight, Spark SQL, Google Cloud (GCP)
- **Machine learning & AI:** Scikit-learn, Pandas, NumPy, RAG, Multi-agent systems, Local LLMs (Ollama)
- **Databases:** SQL Server, PostgreSQL, MySQL, Redis, DuckDB
- **BI & visualization:** Power BI, QGIS, Shiny
- **Back end & APIs:** ASP.NET Core, Blazor, Spring Boot, REST APIs, Microservices, RabbitMQ, SignalR, Entity Framework Core
- **Front end:** Next.js, React
- **DevOps & tooling:** Docker, Linux, Git, Azure DevOps, GitHub Actions, Jenkins, Grafana, Scrum

CERTIFICATIONS

- Microsoft Certified: Fabric Data Engineer Associate (DP-700)
- Microsoft Certified: Fabric Analytics Engineer Associate (DP-600)
- Apache Spark SQL for Data Analysts, Databricks
- Google Data Analytics Professional Certificate
- Google Business Intelligence Professional Certificate
- Data or Specimen Only Research

LANGUAGES

French (Fluent) · English (Proficient) · Spanish (Conversational)