SEBASTIÁN AGUILERA NOVOA

Physicist - Computer Scientist - Problem Solver

saguileran@unal.edu.co | +57 3195140529 | saguileran.github.io | saguileran | saguileran | Bogotá D.C.

EXPERIENCE

Junior Python Developer - Prompt Engineering
MarBAI

Mar 2024 – Mar 2025 | Remote

- Create, deploy, and evaluate intelligent agents using Python and REST APIs to generate digital content for social media.

Junior Python Developer - Prompt Engineering
AI GENERATIVE S.A.S. – AIGEN S.A.S.

Sep 2024 – Mar 2025 | Remote

- Utilizing text-to-image models to generate digital media content for social media, featuring fictional characters or non-real personas.

Professor
Escuela Tecnológica Instituto Técnico Central (ETITC)

Mar 2024 – Dec 2024 | Bogotá, Colombia

- Teaching Java programming (both backend and frontend), databases, operating systems, software design, and data structures to systems engineering university students. All courses are hosted on GitHub and can be accessed via the link courses.

Professor - Trainer
Ingresar a la U

Mar 2023 – Jul 2024 | Colombia

- Teaching mathematics, physics, and tips and techniques for answering multiple-choice questions on the Saber 11 exam administered by ICFES, to school students from both urban and rural areas of Colombia.
- Training professors to instruct students on effectively answering multiple-choice questions.

MAAD - Soundscape Analysis in Python
scikit-maad project

Jan 2023 – Feb 2023 | Bogotá D.C., Colombia

- Create spectral and time traits with examples, test, and documentation.

INTERESTED IN

Bioacoustics | Deep Learning | Languages | Ecology | Simulations | Music | Teaching

EDUCATION

M.Sc. in Computer Science
University of Sao Paulo

2025 – 2026 | Sao Paulo, Brazil

B.Sc. in Physics
National University of Colombia

2015 – 2023 | Bogotá D.C., Colombia

Residential Electrical Installation Technician
Servicio Nacional de Aprendizaje (SENA)

2012 – 2013 | Bogotá D.C., Colombia

MOST PROUD OF

Awarded Jhoti and Salazar Scholarship

São Carlos Institute of Physics, USP

2023 | São Carlos, Brazil

Second best undergraduate dissertation in physics

Physics Department, UNAL

2023 | Bogotá, Colombia

LANGUAGES

Spanish
English
Portuguese
German

RESEARCH EXPERIENCE

Internship in Molecular Modeling and Simulations

São Carlos Institute of Physics - University of São Paulo

Feb 2023 – Apr 2023 | São Carlos, Brazil

- Set up and contrast Monte Carlo (MC) and molecular dynamics (MD) simulations of a protein-ligand system to generate structured data (positions, velocities, RMS, etc).
- Analyze the structured data generated by the MC and MD simulations using Markov model algorithms (lag-time, hiden markov chains, etc).

Summer Research Program

Electrical & Computer Engineering - University of Delaware

Jun 2021 – Sep 2021 | Delaware, EEUU

- Analyze and visualize long raw audio data using signal processing and Matlab, 2-week continuous records from a microphone in a the Delaware Bay river.

PROJECTS

Birdsongs

National University of Colombia

Aug 2022 – Currently | Bogotá D.C., Colombia

- Python packing of the **motor gestures for birdsongs** model that simulates the sound production in birds.
- Automate the generation of synthetic birdsongs (audio/images) using numerical optimization theory and algorithms, numerical methods, and signal processing.
- Study and analyze of bandwidth as function of the length of the trilled syllables (last syllables of the birdsongs) for several Zonotrichia Capensis from different countries.
- Generate comparable synthetic birdsongs of some Colombian bird species: Zonotrichia Capensis, Rhinocryptidae, and Mimus Gilvus.

Molecular Modeling and Simulations

University of Sao Paulo

Feb 2023 – Apr 2023 | Sao Carlos, Brazil

- Study and evaluation of molecular simulations of the un/binding kinetics in a protein-ligand system.
- Set up and execution of several MD and MC simulations for different systems.
- Analysis the un/binding events of the MD and MC simulations by numerical analysis.

STRENGTHS

Hard-Working | Eye for detail | Fast-Learning | Creativity | Adaptability | Passionate | Curious

Problem Solving | Self-Learner | Leadership | Mathematical Modeling | Critical Thinking

Active Listening | Empathy | Patience | Analysis

WORKSHOPS/SCHOOLS

19th Brazilian Symposium on Computer Music (SBCM 2025)

Computer Music Interest Group (CECM) of the Brazilian Computing Society (SBC)

September 15-17, 2025 | Campinhas, Brazil

Poster Presentation - 3rd Conferencia Colombiana de Matemáticas Aplicadas e Industriales (MAPI 3)

Comisión de Matemáticas Aplicadas e Industriales de la Sociedad Colombiana de Matemáticas

June 12-14, 2024 | Bucaramanga, Colombia

Machine Learning for Quantum Matter and Technology

Workshop - Organized by University of the Andes

May 27-31, 2019 | Bogotá, Colombia

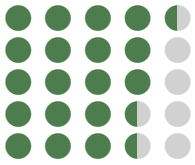
PUBLICATIONS

Books

- S. A. Novoa, *Design, development, and evaluation of a computational physical model to generate synthetic birdsongs from recorded samples*. National University of Colombia, digital archive., 2022, Bachelor's Dissertation.

SOFTWARE SKILLS

Python, Latex, Office, VSC
Java, Github, Linux, SSH, Matlab
Jupyter-Notebook/Lab, Markdown
Julia, Krita, C++, Power BI, OpenAI
Mathematica, Canva, Comfyui



Aprender - A New Way of Learning

Freelance

2019 – 2022 | Bogotá D.C., Colombia

- Design, create and host a homepage for the preparatory.
- Implement the Moodle platform on the homepage as a Learning Management Platform.
- Mathematics and physics teacher: design and creation of lessons and tests for evaluation.

Recorder Characterization

National University of Colombia

2020 | Bogotá D.C., Colombia

- Study the recorder musical instrument from experimental, theoretical, and computational physics.
- Analyze and visualize the structured data generated and measured from the study in order to compare them.
- Development wave acoustic pressure visualization using a LBM and Paraview for comparison with measurements.

Acoustic Simulation of a Classroom

National University of Colombia

2019 | Bogotá D.C., Colombia

- Modeling and simulation of a conference classroom using the Lattice Boltzmann Method (LBM), writing in c++ using OOP, to generate comparable structured data.
- Physical and computational measurement of classroom reverberation time for comparison.

Physics Laboratories

National University of Colombia

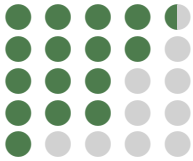
Aug 2015 – Dec 2021 | Bogotá D.C., Colombia

- Set up laboratories to validate physical theories by measuring structured data (physical measurable quantities).
- Create lab reports with the state of art, discussion and analysis (involving mathematical fittings to the structured data), methodology, and conclusions.

Postman, Google Cloud, Firebase
JS, HTML, SQL, CSS, Workbrench

PYTHON LIBRARIES

Matplotlib, Numpy, Pandas
Tensorflow, Scipy, Plotly, Pytorch
Scikit-Learn, Sympy, Seaborn, Librosa
Sphinx, Seaborn, OpenCV, Requests
Django, LangChain



TRAINING/CERTIFICATIONS

Sequence Models

Coursera

2024 | Online

Convolutional Neural Networks

Coursera

2023 | Online

Structuring Machine Learning Projects

Coursera

2023 | Online

Introduction to Structured Query Language (SQL)

Coursera

2022 | Online

Neural Networks and Deep Learning

Coursera

2021 | Online

Improving Deep Neural Networks: Hyperparameter Tuning, Regularization and Optimization

Coursera

2021 | Online

REFEREES

Prof. Francisco Gómez Jaramillo
@ National University of Colombia (UNAL)
fagomezj@unal.edu.co

Prof. Marcelo Gomes de Queiroz
@ University of Sao Paulo (USP), Brazil
mqz@ime.usp.br

Prof. Gabo Mindlin
@ University of Buenos Aires (UBA), Argentina
gabo@df.uba.ar