



David Plazas

Date of birth: 12/10/1999 | **Nationality:** Colombian | **Gender:** Male | (+57) 3163234679 |

daples1@gmail.com | davidp@ealax.com | github.com/Daples |

researchgate.net/profile/David-Plazas-Escudero | linkedin.com/in/david-plazas-escudero/ |

Whatsapp Messenger: +57 3163234679 | Calle 24 sur 5 80, Envigado, Colombia

About me: Mathematical Engineer skilled in statistics, optimization, control theory, data analysis and applied mathematics, with strong theoretical background. Experienced in academic research, team projects, mathematical modeling and simulation.

WORK EXPERIENCE

26/06/2021 – CURRENT – Envigado, Colombia

SIMULATION ENGINEER | DATA SCIENTIST – FINCRIME DYNAMICS LTD.

Remote work in a start-up (former EalaX Ltd.) in the United Kingdom, which includes tasks related to mathematical modeling of fraud and money laundering schemes, synthetic data generation, stochastic processes, machine learning and statistical analysis of data. I worked the first four months from Ghent, Belgium.

15/01/2021 – 14/06/2021 – Brussels, Belgium

RESEARCH INTERN – BRUSSELS PHOTONICS TEAM, VRIJE UNIVERSITEIT BRUSSEL

Five-month internship as part of one of my Bachelor's semester. The project focused on classification of polymer materials using MATLAB, based upon Raman spectroscopy measurements, signal processing, synthetic data generation and machine learning. The internship also included hands-on experience in the lab with preparation and collection of Raman signal measurements.

06/05/2020 – 05/08/2020 – Medellín, Colombia

RESEARCH ASSISTANT – EAFIT UNIVERSITY

Assist on the mathematical modeling of an ABMS model for assessing the COVID-19 disease in Medellín, as part of a project fully funded and approved by the Department of Science, Technology and Innovation of Colombia.

23/01/2018 – 15/12/2020 – Medellín, Colombia

TEACHING ASSISTANT – EAFIT UNIVERSITY

Teaching assistant for the course Quantitative Methods (engineering), where I strengthen my abilities in linear programming, decision analysis and simulation.

EDUCATION AND TRAINING

12/01/2017 – 29/06/2021 – Medellín, Colombia

B.SC. IN MATHEMATICAL ENGINEERING – EAFIT University [GPA 4.77/5.00]

- Second best GPA among graduates.
- Mathematical Modeling and Simulation (SIMAT) research seminar coordination.
- Research in applied mathematics.
- Overall knowledge: Robust and non-parametric statistics, data analysis, control theory, optimization, stochastic processes and artificial intelligence.

LANGUAGE SKILLS

Spanish (mother tongue), English (C1, 104/120 TOEFL iBT), Portuguese (B1), Russian (A1), Dutch (A1)

DIGITAL SKILLS

Python | LaTeX | Julia | MATLAB - Simulink | Git | Inkscape | R | Microsoft Excel | Simul8 | Java | Linux | Atlassian Confluence and Jira

● TECHNICAL AND PERSONAL SKILLS

Personal Skills

- Commitment
- Passionate for knowledge
- Enthusiastic
- Open-minded

Scientific Interests

- Applied mathematics
- Robust and non-parametric statistics
- Optimal control
- Artificial intelligence
- Optimization
- Mathematical modeling and simulation

Hobbies and Interests

- Video games and online interaction
- Swimming and walking
- Reading books
- Computers and technology

● PUBLICATIONS

Towards a Benchmark for Financial Crime Controls using Synthetic Data (In review, 2021)

Given the recent trends of using synthetic data to train machine learning models, this paper will propose a novel approach to implement a benchmark of classifiers for detecting money laundering using enriched synthetic data with financial crime labels.

Classification of Polymer Materials using MATLAB based upon Raman Spectroscopy Measurements (In review, 2021)

This publication will be the result of my internship at the Brussels Photonics Team at the Vrije Universiteit Brussel. This work focuses on characterization of commercial plastic materials using Raman signals, synthetic data generation and supervised models.

● CONFERENCES AND SEMINARS

09/05/2018 – 11/05/2018 – Envigado, Colombia
XVII Regional Conference of Research Seminars

Main speaker in the project "Robust Statistical Techniques for Understanding and Modeling Portfolios in the Financial and Energy Market". This project was peer reviewed for further national and international conferences.

● PROJECTS

Simulation of Advection-Diffusion-Reaction System (2020)

Knowledge: weak formulation of PDEs, domain definition and finite elements method. Software: Python (FEniCS).

Evaluation of Robust Covariance Estimation for Object Detection (2020)

Knowledge: robust covariance estimation, object detection, similarity measures, generalized eigenvalues, image features. Software: Python.

Supervised Learning for Psychological Attention to High School Students (2020)

Knowledge: supervised learning, decision trees, support vector machines, artificial neural networks and performance analysis. Software: Julia and Python.

FIS-based Controller for Security Planning (2020)

Knowledge: fuzzy inference systems, nonlinear dynamics, simulation-control implementation, activation space. Software: Julia.

Agent-Based SEIRD Model for Geographic Population Dynamics in the COVID-19 Context (2020-2021)

Knowledge: agent-based modeling simulation, data analysis, policies formulation, statistics, complex systems. This project was funded by the Administrative Department of Science, Technology and Innovation of Colombia.

On the Approximate Optimal Feedback Control for ODEs Involved Dynamic Systems (2020)

Knowledge: optimal control, β -relaxations, feedback control, control-affine systems, approximation and convergence theory.

A Formal Approach to Optimal Strategic Decisions in Security Policies (2019)

Knowledge: nonlinear dynamics, optimal control, invariant sets, dynamic optimization. Software: Python.

Improving Customer Waiting Time for Medicine-Retrieval Center (2019)

Knowledge: complex system modeling, queue theory, discrete-event simulation, simulation-optimization, statistical analysis of input-output data, white and black-box validation, conceptual modeling. Software: Simul8 and Python.

Constructive solution, local search, random search and hybrid algorithms for solving Vehicle Routing Problems (2019)

Knowledge: discrete optimization, heuristic algorithms, construction of initial solutions, diversification and intensification, local search, random search, genetic algorithms. Software: Python.

Simulation, Linear Analysis and Discrete Control for Rössler System based on circuits (2019)

Knowledge: nonlinear systems, chaotic behavior, strange attractors, transfer functions, discretization, indirect Lyapunov stability analysis, Laplace and Z transforms, frequency response, Bode diagram, closed-loop stability, gain and phase margins, discrete PID and linear state feedback controllers, heuristic and exact PID tuning methods. Software: MATLAB and Simulink.

Introduction to Fractional Systems (2019)

Knowledge: nonlinear fractional differential equation (FDE) systems, Caputo-type fractional derivative, numerical methods for FDEs: Adams-Bashforth-Moulton predictor-corrector and Adomian decomposition, chaotic systems and strange attractors. Software: MATLAB.

Analysis of Fractional-Order System for Financial Dynamics (2018)

Knowledge: nonlinear fractional differential equation system, Caputo-type fractional derivative, Adams-Bashforth-Moulton predictor-corrector, feedback control and sensitivity analysis. Software: MATLAB.

Cryptocurrency Scams (paper accepted for XVI CLADS 2018)

Knowledge: system dynamics, Forrester diagram, model validation, policy design, causal relations. Software: Vensim.