Luis Eduardo Mauricio Álvarez

B.Sc. Physics | Certified Data Scientist | Computer Science
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eduardoalvarz

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Projects

- **Bachelor's Thesis - University Autónoma de Querétaro (UAQ)** — Querétaro, MX
  Deep Learning for Atmospheric Pollutant Forecasting — *August 2022 - Present*
  - Developed a transformer-based neural network in Python with the PyTorch, TensorFlow, Pandas, and NumPy library to forecast PMCO levels in Mexico City.
  - Implemented data cleaning techniques: MICE for missing values and Z-Score for outlier removal, on PMCO 2022 data.
  - Evaluated the model's accuracy over various prediction horizons: 12, 24, 48, and 72 hrs. Achieving a 12-14% reduction in RMSE compared to traditional models like LSTM and ARIMA.
  - Currently preparing this research for submission to the magazine "Earth Science Informatics" in Springer.

  Technologies: Python, TensorFlow, PyTorch, Pandas, NumPy.

- **High Technology Unit - UNAM** — Juriquilla, MX
  Contribution to the Development of the K'OTO Nanosatellite — *March 2021 - January 2022*
  - Developed and implemented C++ algorithms for data and signal processing in a Linux environment, enhancing the nanosatellite's data analysis capabilities for scientific research.
  - Actively collaborated in a multidisciplinary team, focusing on the integration and quality of complex data systems.

  Technologies: Linux, C++, Data Processing, Signal Processing.

Education

- **Autonomous University of Querétaro** — Querétaro, México
  B.Sc in Physics — *August 2019 - July 2024*
  - Relevant courses: Advanced Quantum Mechanics, Numerical Analysis, Analysis of Probabilistic Systems, Dynamical Systems I and II, Artificial Intelligence, etc.

Certifications

- **IBM** — MOOC
  Data Science Methodology - ID: RK28ZPWZPXE4 — *Issued February 2024*
  Python for Data Science, AI & Development - ID: JD3PH6Y4FFMX — *Issued February 2024*
  Databases and SQL for Data Science with Python - ID: N5644PGF2LPE — *Issued February 2024*

Projects - github

- Deep Learning for Atmospheric Pollutant Forecasting: Transformer-Based Approach to Predict Coarse Particulate Matter (PMCO) Concentrations in Mexico City - Bachelor's Thesis
- Webscraping Stock Data Extraction and Visualization - Python Project for Data Science IBM Certification

Volunteer Work

- **ijgd Workcamp** — Berlin/Potsdam, Germany
  International Volunteer — *June 2023 - July 2023*
  - Actively participated in habitat restoration projects at the Treibgut Reserve. Enhanced intercultural collaboration skills.

Other programming tools

- **Deep learning frameworks:** Keras, Tensorflow, Pytorch.
- **R:** dplyr, ggplot, tidyr, shiny, plumber.
- **Python:** sci-kit, pandas, matplotlib, seaborn.
- **SQL:** Advanced querying (joins, subqueries, functions), data manipulation (insert, update, delete), SQLite.
- **Software:** Linux, Excel, Mathematica, LaTeX, Power BI, Tableau, Arduino.