

Juan Antonio Robledo Lara

DATA SCIENTIST

Benito Juarez, Mexico City, Mexico.

+52 444-177-7324 | jroblar98@gmail.com | jroblar.github.io | github.com/jroblar | linkedin.com/in/jroblar

Personal Profile

I am a **Senior Research Programmer** at the **Decision Science Center, Tecnológico de Monterrey**, specializing in **data science** and **machine learning** for climate action, urban development, and sustainable policy. I hold an **M.S. in Computer Science (Machine Learning)** from **Georgia Tech** and have experience developing predictive models, data pipelines, and simulations for large-scale socio-economic and environmental analysis. My background includes research roles at **IPICYT** and **Harvard Medical School**, where I applied ML, software development, and 3D bioprinting techniques. Fluent in **English and Spanish**, I am a **research-driven professional** passionate about applying data science and ML to solve challenges.

Skills

Programming	Python (Pandas, NumPy, Scikit-learn, XGBoost, Statsmodels, Matplotlib, Seaborn, SHAP), SQL, Git, Jupyter Notebooks
Machine Learning	Exploratory Data Analysis (EDA), Model Selection & Evaluation, Forecasting & Time Series (ARIMA, ETS), Classification, Regression, Clustering, Feature Engineering, Dimensionality Reduction, Data Visualization
Tools	Tableau, Amazon Web Services (AWS), Git/GitHub, Conda, VS Code

Work Experience

Senior Research Programmer

Benito Juarez, Mexico City, Mexico

Tecnologico de Monterrey

October 2024 – Present

- Implemented **system dynamics models** in **Python**, including a **societal collapse model** and a **housing affordability model**.
- Developed **ensemble experimentation pipelines** and applied **unsupervised learning (GMM, KMeans)** on **time series outputs** to identify scenario taxonomies.
- Built an **XGBoost-based surrogate model** to approximate **SISEPUDE** outputs, enabling faster optimization workflows.
- Engineered a **PSO-based calibration pipeline** for complex simulation models, improving predictive accuracy.
- Supported **World Bank** teams with **mitigation pathway simulations** via **SISEPUDE**, contributing to **CCDR reports** for multiple countries.
- Created a **hybrid forecasting framework** combining **Random Forest** with **ARIMA** to project **CO₂-equivalent emissions**.

Research Engineer

San Luis Potosi, Mexico

IPICYT

August 2021 – July 2022

- Developed **Python-based ETL pipelines** to collect, clean, and store **air quality sensor data** for large-scale analysis.
- Applied **regression models** to calibrate sensors, achieving **R² > 0.9** when validated against commercial monitors.
- Implemented **data preprocessing** and visualization workflows using **Pandas** and **Matplotlib** to analyze time series trends.
- Automated **data acquisition** and reporting, reducing manual work and improving the efficiency of analysis pipelines.

Research Trainee

Boston, MA, USA

Brigham and Women's Hospital / Harvard Medical School

June 2019 – January 2020

- Developed a **3D printer** for creating small **biomaterial constructs** aimed at **tissue engineering applications**.
- Built **control software and a user interface** for the 3D printer using **Arduino, C++, and Python**, enhancing system automation and usability.
- Designed **paper-based devices** for **in vitro tissue modeling**, utilizing **extrusion-based hydrogel bioprinting techniques**.
- Conducted original **research** resulting in publications in **renowned academic journals**.

Education

Georgia Institute of Technology

Atlanta, GA, USA

MS in Computer Science

August 2022 – May 2024

Courses: Algorithms, Artificial Intelligence, Machine Learning, Deep Learning, Data and Visual Analytics, Computer Vision, Robotics

Tecnológico de Monterrey

San Luis Potosi, Mexico

B.S. in Mechatronics Engineering

August 2016 – June 2021

Courses: Control Theory, Robotics, Intro to Programming, Linear Algebra, Statistics and Probability

Teaching

Computer Science for Public Policy (Teaching Assistant)

Mexico City, Mexico

Tecnologico de Monterrey

Jan 2025 – Mar 2025

- Developed assignments, held office hours, and supported students with course material.
- Assisted in teaching key concepts such as **databases, data structures, algorithms, Python, Pandas, and SQL**.

ECE 3741 Instrumentation & Electronics Lab (Teaching Assistant)

Atlanta, GA, USA

Georgia Institute of Technology

Aug 2022 – May 2024

- Led four weekly laboratory sessions per semester, guiding **120+ students** in circuit analysis and electronics.
- Designed lab exams, graded assignments, and provided hands-on support for circuit implementation.