Pedro Ivo Santos Leite

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PROFESSIONAL SUMMARY

Currently pursuing a Master's degree in Computer Science (AI and Machine Learning) with a solid background in IT, specializing in the development of intelligent solutions for agribusiness. Expertise in creating predictive models for beef and dairy cattle farming, using advanced techniques in Machine Learning, Time Series, and IoT data analysis. Hybrid profile combining academic rigor with practical experience in systems infrastructure, focused on transforming complex data into operational forecasts of high strategic value for the agricultural sector.

EDUCATION

Instituto Federal de Campina Grande   2025 – Atual
Master's student in Artificial Intelligence and Machine Learning   *Campina Grande, PB*
- Research focused on Deep Learning applied to Animal Phenotyping or Time Series for Agribusiness.
- Subjects: Statistical Methods, Advanced Topics in Software Engineering.

Universidade Federal da Paraiba   Campina Grande, PB, Brasil
Bachelor of Arts in Computer Science, Minor in Electronic Engineering   *Jan. 1975 – Dec 1975*

Universidade Federal da Paraiba   Campina Grande, PB, Brasil
Post-Graduating Studies in Computer Science   *Jan 1980 – Dec 1980*

EXPERIENCE

ITFPB - Machine Learning Researcher (Master's)   2024 – Present
Precision Livestock Project   *Campina Grande, Brazil*
- Developing **Time Series Forecasting** models for milk production and cattle weight gain prediction.
- Processing high-volume data from IoT sensors and historical farm records for agribusiness optimization.
- Applying **Feature Engineering** techniques to biological and climatic variables, including the Temperature Humidity Index (THI).

Intelicampo - Inteligent Farming   2013 – Present
IT Project Manager   *Brazil*
- Leading IT initiatives in the **Agribusiness** sector, focusing on digital transformation and data-driven solutions for farm management.
- Overseeing project lifecycles to integrate technology into agricultural operations, enhancing productivity and operational control.

Intelicampo Info   pedroivoleite.github.io/Intelicampo

RBC Investor Services - Worldwide Banking   2007 – 2013
Systems Analyst / IT Project Manager   *Canada*
- Acted as both Systems Analyst and Project Manager in the **Financial Services** industry, managing complex systems for international investors.
- Optimized financial software workflows and ensured high availability of mission-critical systems in a global banking environment.

Companhia Hidro Elétrica do São Francisco) - Energy Management System   1978 – 1999
IT Systems Developer   *Brazil*
- Developed core IT systems for the **Energy** sector, contributing to the automation and digitalization of large-scale infrastructure.
- Built and maintained software solutions for utility management and operational data processing.

PROJECTS

Data Science and Data Engineering | *Python, Colab, Scikit-learn, Climate APIs,* Intelicampo   2024
- Generation of Parameterized Synthetic Datasets: Developed from scratch a simulated dataset for 200 animals during a 60-day cycle, using real feedlot business rules and statistical distributions (normal and exponential) to model variables such as Average Daily Gain (ADG) and Feed Conversion Ratio (FCR).
- Data Processing and Cleaning: Implemented pipelines in Python (Pandas and NumPy) for aggregating daily records, handling missing values, detecting outliers via Z-Score, and transforming categorical variables into numerical models.

Advanced Statistical Analysis | *Python, PostgreSQL, SciPy, Statsmodels*   2024
- Validation of Statistical Assumptions: Rigorous Shapiro-Wilk (normality) and Levene (homoscedasticity) tests were applied to ensure the integrity of parametric tests and the correct choice between Welch or Mann-Whitney tests.
- Analysis of Variance and Hypothesis Testing: One-Way ANOVA and Tukey's HSD post-hoc test were used to statistically validate that diet C was superior to the others in animal performance, providing a basis for nutritional decision-making.
- Residual Analysis: Performed model diagnostics to verify independence and constant variance, ensuring that statistical conclusions were not biased by type I or type II errors.

Machine Learning and Predictive Modeling | *Python, PostgreSQL, Pandas, NumPy*   2024
- Development of Classification Models: Implemented and compared Decision Tree and K-Nearest Neighbors (KNN) algorithms to predict animal culling, achieving validated accuracy against reference models (Dummy Classifier).
- Stochastic/Probabilistic Modeling: Developed a Binary Logistic Regression model to quantify how weight gain influences the probability of culling, proving that the effect is statistically significant ($p < 0.001$).
- Analysis of Variable Importance: Using AI models, it was identified that GMD (General Average Daily Gains) is the most significant factor in culling decisions, allowing for the prioritization of monitoring metrics in the field.

Business Intelligence (BI) and Precision Livestock Farming | *Python, PostgreSQL, RFID*   2024
- Development of Intelligent Culling Criteria: Created a decision system based on composite criteria (ADG, ICA, Total Cost and Cost per Kg Gain) to identify "unproductive" animals that generate economic losses.
- IoT Technology Integration: Designed the Intelicampo platform architecture, integrating automated data collection via IoT and RFID sensors for weighing without human intervention and data transmission to the cloud.

Data Visualization and Communication | *Python, PostgreSQL, Matplotlib, Seaboard, Plotly*   2024
- Analytical Dashboards: Created complex visualizations using Matplotlib, Seaborn, and Plotly, including correlation matrices, histograms with KDE, scatter plots with trend lines, and interactive boxplots for performance analysis and anomaly detection.

TECHNICAL SKILLS

Languages: Java, Python (Pandas, Scikit-learn), C/C++, SQL (Postgres), JavaScript, HTML/CSS, R
Frameworks: React, Node.js
TI/MLOps: Git
Libraries: Pandas, NumPy, Matplotlib
Agro Context: Average Daily Weight Gain (ADG), Lactation Curves, Heat Stress Analysis.