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Top Skills

Fine Tuning

AI Agents

Retrieval-Augmented Generation (RAG)

Languages

Dutch (Elementary)

English (Professional Working)

Español (Native or Bilingual)

Certifications

Academy Accreditation - Generative AI Fundamentals

AI Engineer Core Track: LLM Engineering, RAG, QLoRA, Agents

Generative AI

Academy Accreditation - Databricks Fundamentals

SQL Total – Certificate

Publications

A preliminary study to apply the Quine McCluskey algorithm for fuzzy rule base minimization

A ternary version of the Quine-McCluskey algorithm for the minimization of fuzzy rule base

An alternative version of the Chi algorithm for fuzzy rule learning in classification, based on obtaining multiple rules for each example.

Efficient inference models for classification problems with a high number of fuzzy rules

Leonardo Jara

Data Science | Machine Learning | AI Researcher | Deep Learning | Python

Capelle aan den IJssel, South Holland, Netherlands

Summary

I am a passionate Data Scientist with a PhD in Artificial Intelligence from the University of Granada, Spain. With a strong background in Data Science, Telecommunications, and Medical Applications, I have built a career at the intersection of Big Data, Machine Learning, and fuzzy rule-based classification systems, applying intelligent algorithms to real-world challenges across both technical and clinical domains.

My professional experience includes key roles at the Paraguayan Communications Company, the national telecom operator (equivalent to KPN), where I led large-scale projects, optimizing transmission and wireless access networks through data-driven strategies, predictive analytics, and KPI-based performance monitoring to enhance network efficiency and service quality.

Currently, I work as a Data Scientist at Radboud UMC (Netherlands), contributing to innovative projects such as tuberculosis detection using advanced machine learning models. In addition, I supervise students and interns, and collaborate in a multidisciplinary environment alongside medical doctors, researchers, and AI experts.

Throughout my career, I have published high-impact research in scientific journals and presented my work at international conferences. My focus lies in solving complex problems through advanced machine learning techniques, with the goal of driving both technological and scientific progress.

I am committed to continuous learning and innovation, always seeking opportunities to apply my expertise in impactful ways. If you are interested in collaborating or exploring professional opportunities, feel free to connect.

A new multi-rules approach to improve the performance of the Chi fuzzy rule classification algorithm

Experience

Radboudumc

Data Scientist

December 2023 - Present (2 years 3 months)

Nijmegen, Gelderland, Netherlands

AI & Data-Driven Innovations in Public Health Diagnostics

- Participate in a multidisciplinary team, focusing on innovative tuberculosis detection methods.
- Work on demonstrating the feasibility of an electronic nose for tuberculosis detection, using advanced machine learning models for signal analysis.
- Conduct comprehensive data analysis on a large-scale database of tuberculosis risk factors, utilizing advanced statistical tools and interactive dashboards to identify key predictors and inform detection strategies.
- Contribute to the development of non-invasive diagnostic solutions, showcasing a blend of technical proficiency and dedication to addressing public health challenges.

Technologies Used:

Python:
- Data manipulation and analysis: Numpy, Pandas
- Data visualization: Matplotlib, Seaborn
- Machine Learning: Scikit-learn (RandomForestClassifier, SelectFromModel, SimpleImputer, ColumnTransformer, Pipeline, OneHotEncoder, cross_validate, train_test_split, StratifiedKFold, cross_val_score, cross_val_predict, PCA, StandardScaler)
- Model evaluation: Scikit-learn (accuracy_score, roc_auc_score, make_scorer, recall_score, precision_score)
- Deep Learning: TensorFlow, Keras (Sequential, Dense, Flatten, Conv2D, MaxPooling2D, Dropout, BatchNormalization, regularizers, models, layers, KerasClassifier), Keras Tuner
- Experiment management: MLflow
- Additional utilities: IPython, os, gc, PyWavelets (pywt), SciPy (fft, iirnotch, filtfilt, butter)

Universidad Nacional de Asunción

Assistant Professor of Mobile Communications - 9th Semester, School of Engineering

July 2016 - Present (9 years 8 months)

Asunción, Paraguay

General concepts of celullar networks
Radio interface
Signal processing
Radio frequency engineering
Telecommunications Management

Networkers S.R.L.
Data Scientist
September 2022 - June 2024 (1 year 10 months)
Asunción, Paraguay

Artificial Intelligence Model to Predict Animal Diseases Based on Collected and Preprocessed Data

- Designing, modeling, programming, and deploying an artificial intelligence model, specifically trained with veterinary records to enhance diagnostic accuracy and treatment efficiency.
- Guiding, supporting, and co-leading efforts in data collection, including the gathering and input of relevant data, to ensure the model's effectiveness and adaptability to real-world veterinary practices.
- Collaborating with a multidisciplinary team to identify key data requirements and integrate advanced machine learning algorithms, aimed at optimizing the AI model's learning process and output.
- Implementing rigorous testing and validation phases to guarantee the model's reliability and precision, setting a new standard in veterinary artificial intelligence applications.

Technologies Used:

Python:
-Data Manipulation & Analysis: Numpy, Pandas
-Data Visualization: Matplotlib, Seaborn
-Machine Learning:
Algorithms: RandomForestClassifier, SVC, XGBClassifier
Model Evaluation: accuracy_score, roc_auc_score, confusion_matrix, recall_score, classification_report, precision_score, f1_score
Preprocessing: MultiLabelBinarizer, LabelEncoder, StandardScaler, OneHotEncoder, category_encoders
Resampling: SMOTE, RandomUnderSampler

Model Selection & Validation: train_test_split, StratifiedKFold, cross_val_score, RandomizedSearchCV
-Dimensionality Reduction: PCA
-Class Weight Handling: compute_class_weight
-Serialization: joblib, pickle
-Web Development: Flask, Flask-CORS
-Pipeline Management: imblearn Pipeline

Universidad de Granada
PhD Candidate in Data Science
November 2019 - December 2023 (4 years 2 months)
Granada, España

I finished my PhD. Working with big data and soft computing for event prediction, innovating with new methods and using programming in R, C++ and python. At the moment I have 6 publications in important technology magazines.

Thesis: "An update of Wang and Mendel's fuzzy rule learning algorithm for classification problems with massive data."

Grade: Summa Cum Laude

UCOM - Universidad Comunera
Instructor in Machine Learning
October 2022 - November 2022 (2 months)
Asunción, Paraguay

Machine Learning
Predictive models
- Decision Trees
- Fuzzy Rule Based Classification Systems
- Evaluation of Predictive Models

Descriptive Models
- aPriori algorithm
- FP-Growth algorithm
- Clustering: Hierarchical Algorithm, Kmeans, DBSCAN
- Evaluation of Descriptive Models

Tools used

- Python
- Google Colab

COPACO S.A. PARAGUAY -- National Telecom Operator (equivalent to KPN)

8 years 4 months

Head of Department Transmission and Access

February 2017 - November 2018 (1 year 10 months)

Asunción, Paraguay

• Strategic Planning and Infrastructure Development: Directed strategic planning and management across IP, Transmission, and Wireless Services, aligning initiatives with corporate growth and technology goals. Led efforts to optimize and expand national communication infrastructure.
• Investment Project Leadership: Managed significant investment projects in cutting-edge technologies including ADSL, GPON, GSM, 3G, LTE, SDH, DWDM, and the cores of IPMPLS and IPTV. Achieved substantial enhancements in network capacity and coverage.
• Process Automation and Optimization: Developed and implemented procedures to automate and optimize operations, significantly enhancing efficiency and reducing costs.
• National Project Development: Orchestrated national telecommunications projects that promoted the expansion and modernization of key infrastructures, driving forward the technological capabilities of the network.

Head of Department Wireless Access

October 2015 - February 2017 (1 year 5 months)

Asunción, Paraguay

• Data-Driven Cellular Network Analysis: Led comprehensive performance analysis of 3G/LTE networks using traffic data, KPIs, and field measurements. Oversaw the deployment of base stations (GPRS/EDGE/HSDPA/HSUPA/HSPA+/LTE) from vendors such as Huawei, ZTE, and Ericsson, integrating geospatial analysis for cell planning, site surveys, and drive tests.
• Predictive Network Optimization: Implemented analytical models to monitor and predict degradation in WCDMA/LTE networks. Leveraged data visualization and processing tools to generate coverage maps, assess spectrum quality, and anticipate bottlenecks or failures. This data-driven approach significantly improved service quality.
• Analytics-Focused Project Management: Managed national infrastructure projects integrating fiber optic and microwave transmission systems, prioritizing decisions based on demand analysis, traffic data, and growth

projections. Data models supported the identification of critical expansion points and network scalability.
• Technical Compliance and Data Validation: Developed technical specifications and coordinated the procurement and installation of key transmission equipment (SDH, PDH, WDM, DWDM, Metro Ethernet), validating compliance through technical audits and analysis of network logs and performance data.

Head of Division Value Added VAS
March 2014 - October 2015 (1 year 8 months)
Asunción, Paraguay

• Data-Driven Management of 3G/LTE and 2G Core Networks: Oversaw Huawei's 3G/LTE packet core systems and Ericsson's 2G systems (MSC and HLR), leveraging network and user profile data to personalize services and enhance customer experience. Coordinated cross-operator data integration to ensure core network stability and performance.
• Analytical Monitoring of International Traffic: Managed the International Transit Exchange, using key indicators such as Average Success Rate (ASR) and error rates to maintain high-quality international communications. Developed dashboards and analytical reports to detect anomalies and resolve number portability issues.
• Automation and Usage Analysis in Prepaid Systems: Led the operation of prepaid systems (High Line, Line IP, Litespan), automating SIM replacement, balance top-ups, and promotional rollouts. Conducted user segmentation and consumption pattern analysis to support targeted campaigns and revenue optimization.
• Real-Time Data-Enabled Wireless Service Innovation: Developed services such as VoIP over LTE and public IP access, integrating real-time traffic analytics to ensure quality for advanced applications like wireless video surveillance and web servers. Also spearheaded LTE roaming enablement through inter-network data validation.
• Insight-Driven Cross-Departmental Collaboration: Collaborated with Commercial, Marketing, Systems, and Planning teams, contributing data insights for business strategy, opportunity identification, and service performance evaluation.

Network Designer
August 2010 - March 2014 (3 years 8 months)
Asunción, Paraguay

• Designed wireless networks for 2G, 3G, and 4G, enhancing telecommunications infrastructure. Supported network planning and

optimization through data analysis and KPI monitoring to ensure performance, coverage, and quality standards

Education

Universidad de Granada

PhD. in Data Science , Artificial intelligence · (January 2019 - December 2023)

Universidad de Granada

Master in Data Science, Artificial Intelligence · (2018 - 2019)

Universidad Nacional de Asunción

Master in Business Administration, Business Administration and Management, General · (2015 - 2017)

Universidad Nacional de Asunción

Engineering Degree, Electrical, Electronics and Communications Engineering