Javier I. Medina Murúa

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Projects / work experience

Quantitative analysis intern – Finance & strategic planning division   *06-07/2019*
Softtek

   Built a prediction model for financial time series data. Mostly implemented in the Python programming language, using methods from machine learning, statistics and signal processing. A friendly interface to analyse data and make predictions was also included, using Tkinter.

Engineering intern – modelling/research assistant   *08–11/2018*
STAL advanced materials

   Prediction model for import sales of a special product. The model clustered imports that had similar characteristics, and the goal was to identify and predict transactions for business intelligence. Most day-to-day work was about data analysis and reports, using null hypothesis testing, and estimating the parameters of the distribution of import sales. Also helped researching academic articles about industrial-scale cost-efficient coating deposition.

Heuristic optimisation for unsupervised learning   *08/2018 – 08/2019*
Tecnológico de Monterrey

   Research project on heuristic optimisation. *Overview:* Proposal of a feature generation approach to clustering to optimise cluster quality. Using genetic programming to generate features, hidden patterns can be detected. A Bayesian non-parametric analysis of the proposal was performed to give insight into the cases where the nonlinear transformation found by the genetic program improved the learning results.

Time series forecasting using rules ensemble   *04/2018 – 08/2019*
Tecnológico de Monterrey

   Project on time-series analysis that started with a professor. *Broad overview:* Forecasting model in MATLAB based on using the distribution of a pattern recognized by an ensemble of simple rules. An investigation to find out what influences test-set performance; for example, data preprocessing, rule syntax, type of ensemble, distribution model, objective function, etc.

Model representations in deep learning   *06–09/2020*
University of Essex

   Dissertation project. An exploration into the function classes that a neural network can represent. Preliminary results were obtained, demonstrating the class of functions computable by a NN with ReLU activations and outlining potential alternative representations of this function class with more computational efficiency. An overview of the use of nonlinear operators in neural networks is also presented.

Skills

Languages	Spanish (mother tongue), English (fluent), German, Portuguese
Programming languages	MATLAB, Python, R, LaTeX, VBA.
Certificates	Deep learning specialization from deeplearning.ai (5 courses).
Personal	Flexible perspective, creativity, patience, attention to detail, empathy.

Education

🇬🇧 M.Sc. in Mathematics   *October 2019 – September 2020*
University of Essex, England

   Master's degree modules: statistical methods, Bayesian computational statistics, nonlinear programming, stochastic processes, combinatorial optimization, partial differential equations, graph theory, research methods, and a dissertation. Part of a double-degree program available to honors students at Tecnológico de Monterrey.

🇲🇽 B.Sc. Engineering Physics   *August 2016 – May 2021*
Tecnológico de Monterrey, Mexico

   Strong background in physical science. Honors program. Some topics I am particularly interested in: quantum & wave mechanics, electronics, optics, semiconductors, statistical mechanics, numerical analysis, and partial differential equations. Currently in 9th semester.

🇲🇽 Minor in Intelligent Systems   *January – December 2018*
Tecnológico de Monterrey, Mexico

   Coursework on various sub-areas of artificial intelligence. Topics include: multiagent systems, deep learning, genetic algorithms, advanced optimization methods, Markov models and Markov decision processes. Six modules: 1. machine learning, 2. multiagent systems, 3. computational intelligence, and 4. intelligent systems. 5. and 6. accredited with two research projects.