

Javier I. Medina Murúa

Expected graduation date: May 2021

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cell ph. (+52) 8181 3939 19

javierimedina@gmail.com

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

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 in the area of 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.

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 the potential of alternative representations of this function class. An overview of the use of nonlinear operators in neural networks is also presented.

Skills and interests

Languages

Spanish (mother tongue), English, German

Programming languages

MATLAB, Python, R, \LaTeX , VBA.

Specialisation

Deep learning specialisation in Coursera from [deeplearning.ai](https://www.coursera.org/deeplearning) (5 courses).

Personal

Changing perspective, creativity, patience, attention to detail.

Interests

Mathematics

Bayesian statistical modelling, optimisation, numerical simulations.

Science

Intelligent systems, digital signal processing, quantum information and computing.

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, solid-state physics, 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: search algorithms and complexity, deep learning, genetic algorithms, advanced optimization methods, Markov models and Markov decision processes. Six modules: 1. machine learning, 2. intelligent systems, 3. computational intelligence, and 4. multiagent systems. 5. and 6. accredited with two research projects.