M.Sc. Juan Pablo Serrano Pérez

My Personal Page — wamjsblvb@live.com.mx — LinkedIn — GitHub

About

I studied a master on science on the speciality of Mathematics, driven by a passion for tackling algorithmic and mathematical challenges with creativity and rigor specialized in the analysis and design of algorithms, aiming to contribute to advancements and efficiency in the fields of computer science, optimization, and mathematical research.

Note: Every magenta text (except from this) is clickable.

Education

Master of Science in Mathematics 2023
Center of Research and Advanced Studies, National Polytechnic Institute, Mexico

Thesis: `Clusters in Optimal Rectilinear Drawings of the Complete Graph: Insights into Potential Recursive Patterns`. You can look at this thesis here.

Bachelor of Physics and Mathematics 2021
National Polytechnic Institute, Mexico

Projects

The following are personal works of projects I am interested in. Most of them are built in Python and are available at my GitHub.

Machine Learning Models

1. Time series forecasting: Development of several models to forecast financial time series. The list of models include a Recurrent Network of Long short-term memory and hybrids models of Convolutional Network and LSTM networks.
2. Language processing to sentimental analysis with an LSTM network.

Clustering Algorithm

Developed a clustering algorithm as part of my master's thesis, exploring an unsupervised learning algorithm to investigate recursion in optimal graphs drawings related to the crossing number problem in combinatorial geometry. .

Automation and Optimization of Backtesting Strategies

Implemented a Python program that optimizes hyparameters for various technical indicators, evaluating buy and sell strategies for assets.

Arbitrage in Foreign Exchange Markets

Designed an algorithm to find real arbitrage opportunities in the Foreign Exchange/Cryptocurrencie Markets.

Linear programming optimization

Developed Simplex Algorithm in Python to find optimal solutions in a linear programming problem.

Work Experience

Microservices Developer 2021 - 2023

Enterprise Resource Planning Solutions, Mexico

I developed various types of applications, particularly focusing on REST and JSON as well as SOAP and XML applications. I worked extensively on client-server integration projects, leveraging technologies such as Java, object-oriented programming, OpenShift, and Apache Camel. Moreover, I had the opportunity to develop OSB (Oracle Service Bus) and SOA (Service-Oriented Architecture) services using

Oracle SOA Suite 12c, where I used XML, XSD, XSLT, and XQuery to ensure efficient communication and integration between systems. Throughout my career, I also became proficient in utilizing essential tools like WebLogic Server, Enterprise Manager, and Oracle Service Bus.

Preparatory Master's Course 2023
Center of Research and Advanced Studies, National Polytechnic Institute, Mexico

I taught a preparatory master's course in abstract algebra (groups and rings). A proof of this course can be found clicking here.

Research

1. *Distance ideals of digraphs*, Carlos A. Alfaro, Teresa I. Hoekstra-Mendoza, Juan Pablo Serrano, Ralihe R. Villagrán, (2024)
   Status: Sent (arxiv.org/abs/2408.02848)
2. *Evolutive sanpiles*, Carlos A. Alfaro, Juan Pablo Serrano, Ralihe R. Villagrán, (2024)
   Status: Sent (arxiv.org/abs/2404.13137)

Skills

Proficient in Python `3.x` and Matlab.

Optimization mathematics, linear and non linear optimization.

Strong background in Probability and Statistics.

Analytical and abstract thinker.

Analysis and design of algoritms.

- Data structures
- Randomised algorithms.
- Parallel computing
- Approximation algorithms.
- Combinatorial optimisation.
- Mathematical optimization and linear programming.

Deep learning.

- DL Frameworks like Tensorflow, Keras ans Scikit-Learn.
- Deep learning models.
  . Convolutional Neural Networks.
  . Recurrent Neural Networks.
  . Natural Language Processing, Transformers, Sentimental Analysis.

Activities

Collaborated in the 4th Reunion of Optimization, Mathematics, and Algorithms held in Mexico City.

Strengths

My proactive approach to learning and problem-solving sets me apart. I consistently seek creative solutions, new ideas, and methodologies to address specific challenges, primarily specializing in the field of algorithmic and computational mathematics.

Languages

English: C1 Proficiency level.

References

Dr. Ruy Fabila-Monroy (rfabila@math.cinvestav.mx)

Dr. Onésimo Hernández-Lerma (ohernand@math.cinvestav.mx)

Dr. Carlos A. Alfaro Montúfar (alfaromontufar@gmail.com)

Note: If you cannot click into my My Personal Page, this is the complete URL: https://jpabloserrano.github.io where you may find access to my contact information, coding projects and more about me.