Joel Chacón Castillo

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Personal Profile

I am a computer researcher scientist with experience in mathematical optimization by means of heuristic optimization, multi-objective optimization and population-based algorithms. Highly motivated to work in applied areas as well as machine learning, deep learning and reinforcement learning in general.

Education

Center for Research in Mathematics *Guanajuato, México*

Doctor of Computer Science (PhD) *January 2017 - December 2022*

- Topic: Mathematical Optimization Algorithms
- Score: 9.7/10.0

Center for Research in Mathematics *Guanajuato, México*

Master of Computer Science (MSc.) *August 2015 - January 2017*

- Thesis topic: Multi-objective Optimization with Evolutionary Algorithms.
- Score: 9.0/10.0

Technological Institute of Irapuato *Irapuato, Mexico*

Computer Systems Engineer (I.S.C) *August 2009 - August 2014*

- Thesis topic: Web System Designed for the Analysis of Small Ribonucleic Acid (sRNA).
- Score: 8.9/10.0

Work Experience

Center for Research in Mathematics *Guanajuato, México*

Software Engineer *August 2014 - May 2015*

- Web development of a web system for the management of visitors and projects budgets.
- Role: Full-stack
- Technical requirements: PHP, Javascrit, SQL, and HTML.

Center for Research in Mathematics *Guanajuato, México*

Research scientist *August 2019 - April 2020*

- The goal of the project was to development a system that given the information of the nutritionist (user) provide a configuration of dishes per day. Note that this tool is designed to feed about 100 hundred homeless kids.
- Particularly, my contribution was the development of an optimizer that given several constraints (macro-nutriments and micro-nutriments) choose a subset of dishes per day that maximize the variability of meals.
- The development of the mathematical optimizer was on C++,

Research

Publications

- VSD-MOEA: A Dominance-Based Multi-Objective Evolutionary Algorithm with Explicit Variable Space Diversity Management (2021). (MIT Press Direct)
- Differential Evolution with Enhanced Diversity Maintenance (2019) (Springer)
- Análisis y diseno de operadores de cruce basados en el cruce binario simulado (2017) (Research in Computing Science)
- The Importance of Diversity in the Variable Space in the Design of Multi-objective Evolutionary Algorithms (in revision - Applied Soft Computing)

Conferences

- A Novel Memetic Algorithm with Explicit Control of Diversity for the Menu Planing Problem (2019) (IEEE)
- Analysis and Enhancement of Simulated Binary Crossover (2018) (IEEE)
- A Multi-objective Decomposition-Based Evolutionary Algorithm with Enhanced Variable Space Diversity Control (2017) (ACM)

Chapters

- Importancia de la Diversidad en el Diseño de Algoritmos Evolutivos (2019) (Amexcomp)

Certifications

2022 **Advanced Learning Algorithms**, Coursera *Machine Learning*
2022 **Supervised Machine Learning**, Coursera *Machine Learning*
2022 **Intro to Machine Learning**, Kaggle *Machine Learning*
2022 **Crash Course on Python**, Coursera *Programming*
2022 **Coding Interview Preparation**, AlgoExpert *Problem Solving*

Teaching Assistant

2019 **Meta-heuristics and mathematical optimization**, homework revision, and personalized sessions
2020 **Numerical Methods**, homework revision, design of exams, and personalized sessions
2022 **Data Structures II**, homework revision, and personalized sessions.

Relevant Courses

Biomedical Images Computational vision and image processing applied to biomedicine
Patter Recognition Machine learning theory of the most common methods for regression and classification
Efficient Programming Algorithms applied to problems as well as competitive programming
Deterministic Optimization Mathematical optimization for unconstrained and constraint optimization (gradient, newton)
Meta-heuristics Local search strategies applied to common problems, genetic algorithms and evolutionary algorithms

Skills

Programming Python (Pandas, Tensorflow, NumPy, Scikit-learn), R (ggplot2), PHP, C/C++, HTML/CSS, JavaScript, SQL, OpenMP and MPI.
Miscellaneous Linux, Shell (Bash/Zsh), LaTeX(Overleaf/R Markdown), Git.
Soft Skills Time Management, Teamwork, Problem-solving, Documentation, Engaging Presentation.

Achievements (Competitions)

2022 **Qualify to round 1**, Code Jam (Google) *International*
2021 **Participate in 6 rounds**, Kick Start (Google) *International*
2018 **Qualify to round 2**, Hacke Cup (facebook) *International*
2019 **Place 82th**, Santa 2019 - Revenge of the Accountants *Kaggle*

Interests

Competitive Programming I love to keep learning and boosting my skills at programming.
Participation in competitions I am interested on participate in computer science events to learn and share knowledge.

Languages

English Professional working proficiency (ILR Level 3)
Spanish Native proficiency

References available upon request.