Guillaume Perez

Contact

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👶 January 2 1990 (33 years)

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Google Scholar
DBLP
GitHub

Skills

Algorithm	▪ ▪ ▪ ▪ ▪
Constraint Programming	▪ ▪ ▪ ▪ ▪
Data Structure	▪ ▪ ▪ ▪ ▫
Optimization	▪ ▪ ▪ ▪ ▫
Machine Learning	▪ ▪ ▪ ▪ ▫
Problem Solving	▪ ▪ ▪ ▪ ▫
Deep Learning	▪ ▪ ▪ ▪ ▫
Data Processing	▪ ▪ ▪ ▪ ▫

Tools

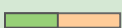| C/C++ | ▪ ▪ ▪ ▪ ▪ |
Python	▪ ▪ ▪ ▪ ▫
Pytorch	▪ ▪ ▪ ▫ ▫
Numpy/Scipy	▪ ▪ ▪ ▪ ▫
Armadillo C++	▪ ▪ ▪ ▪ ▫
MatLab	▪ ▪ ▫ ▫ ▫

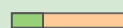## Language

French ▪▪▪▪▪
English ▪▪▪▪▫
Spanish ▪▪▫▫▫
Japanese ▪▫▫▫▫

Research Consultant

Experience

Optimization and Scheduling Consultant
Huawei Technologies, Paris (2019-2021; 2022-2023)

Algorithms design for instructions **scheduling** and software **pipelining**. **Constraint Models** for train scheduling and **network design**. Design and implementation of a robust **hybrid optimization** solver. Design of **rematerialization** algorithms for **large language models**.

Deep Learning for Embedded Vision Consultant
Imra Research, Sophia Antipolis (2018-2019; 2021-2022)

Design of a **deep learning** pipeline for **video analysis** and **anomaly** detection using multi-modal inputs. **Deep reinforcement learning** for electric **motor control**. Design of **oscillation-free** action loss functions.

Postdoctoral position - Constrained Machine Learning
Cornell University, Ithaca, New York (2017-2018)

Development of methods linking together algorithms of **machine learning** and **constrained optimization**. Applications in **materials science**, biology and ecology.

Education

PhD Artificial Intelligence - Constraint Programming
Université Nice Sophia Antipolis (2014-2017)

Design and implementation of **algorithms** mixing **compression**, **data structures** and **stochastic** optimization. Application in **music generation** and soil analysis.

Master's degree: Computer Science
Université Nice Sophia Antipolis (2012-2014)

Three **Constraint programming** internships. Design and implementation of compressing **data structures** for constraint solvers.

Projects

Optimization

C++

Constraints Solver: Combinatorial optimization solver for scheduling and design space problems.

MDD: Multi-valued Decision Diagrams library for optimization. First generic relax-MDD API.

Constraints: implementation, table and MDD in SOTA CP solvers (Or-tools, choco, oscar)

TicTacToe: AI design API for the TicTacToe game. Used by Master students

Python

Bandit: Multi-armed bandit UCB1 implementation for algorithm selection.

Machine Learning

C++

Projected Gradient Descent: Projection onto the simplex and weighted l1 ball. Sparsity learning.

Compressed Sensing: Data reconstruction framework from noisy and sparse signal.

NMF Solver: Non-negative matrix factorization solver for Data reconstruction.

Python

Neural network design (TensorFlow) for Crystal structure prediction.

Neural network design (Pytorch) for autonomous driving, scene analysis and feature extraction.

Selected Publications

The Generalized Confidence Constraint - Perez G. et al. - **AAAI 2023 (A*)**

Distribution Optimization in Constraint Programming - Perez G. et al. - **CP 2023 (A)**

Reducing adverse impacts of Amazon hydropower expansion
A. Flecker, Shi Q. et al. - **Science 2022 (IF 47.73)**

Efficient projection algorithms onto the weighted l_1 ball
Perez G., Barlaud M. et al. - **Artificial Intelligence 2022 (IF 14.05)**

A deep reinforcement learning heuristic for SAT-based on GNN
Fournier T, Lallouet A. et al. - **ICTAI 2022 (B)**

A filtered bucket-clustering method for projection onto the simplex and the l_1 ball
Perez G., Barlaud M. et al. - **Mathematical Programming 2020 (IF 3.78)**

Reducing greenhouse gas emissions of Amazon hydropower with strategic dam planning
Almeida R. Shi Q. et al. - **Nature Communications 2019 (IF 11.87)**

Objective as a Feature for Robust Search Strategies - Palmieri A. Perez G. - **CP 2018 (A)**

Parallel Algorithms for Operations on MDDs - Perez G. Régin JC. - **AAAI 2018 (A*)**

Extending the Capacity of 1/f Noise Generation
Perez G., Rappazzo B., Gomes C. - **CP 2018 (A)**

Relaxed Projection Method for Constrained Non-negative Matrix Factorization
Bai J., Ament S., Perez G. et al. - **CPAIOR 2018 (B)**

MDDs: Sampling and Probability Constraints
Perez G. Régin JC. - **CP 2017 (A)**

Soft and Cost MDD Propagators - Perez G. Régin JC. - **AAAI 2017 (A*)**

Compact-Table: Efficiently Filtering Table Constraints with Reversible Sparse Bit-Sets
Demeulenaere J.. et al - **CP 2016 (A)**

Enforcing Structure on Temporal Sequences: The Allen Constraint
Roy P.,Perez G. et al - **CP 2016 (A)**

Efficient Operations On MDDs for Building Constraint Programming Models.
Perez G. Régin JC. - **IJCAI 2015 (A*)**

Improving GAC-4 for Table and MDD based constraints
Perez G. Régin JC. - **CP 2014 (A)**

Combinatorial Optimization   ***Machine Learning***   ***Continuous Optimization***