Guillaume Perez

Contact

38 bd Sadi Carnot

06110, Le cannet, France

+33 6 51 04 66 89

January 2 1990 (34 years)

guillaume.perez06@gmail.com

perezguillau.me

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++	■	■	■	■	■
CUDA/HIP	■	■	■	■	■

Language

French ■■■■■

English ■■■■■

Spanish ■■■■■

Japanese ■■■■■

Research Scientist

Experience

- **Deep Learning for 3D rendering** Consultant
  AMD France, Paris (2024)
  Neural Radiance Fields and **embeddings** optimization for 3D rendering. **Conditioning** optimization and **GPU** implementation. C++ and Pytorch.
- **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; 2024)
  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

- **Master's** degree & **PhD** in Artificial Intelligence - CS
  Université Nice Sophia Antipolis (2012-2017)
  Design and implementation of **algorithms** mixing **compression**, **data structures** and **stochastic** optimization. Application in **music generation** and soil analysis.

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++

Sparsity and Compression: Projection onto the Bi-level and Multi-level $l_{p,q}$ ball. Pytorch bind.

Projected Gradient Descent: Projection onto the simplex and weighted l_1 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 (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***