Guillaume

Perez

Contact

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<u>GitHub</u>

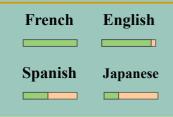
Skills

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



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

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)

<u>TicTacToe</u>: Al design API for the TicTacToe game. Used by Master students

Python

C++

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

Machine Learning

<u>Sparsity and Compression</u>: Projection onto the Bi-level and Multi-level I_{p,q} ball. Pytorch bind.

Projected Gradient Descent:

Projection onto the simplex and weighted I₁ ball. Sparsity learning.

<u>Compressed Sensing</u>: Data reconstruction framework from noisy and sparse signal.

<u>NMF Solver</u>: Non-negative matrix factorization solver for Data reconstruction.

Python

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

