

Mathieu Tanneau, PhD

 mtanneau.github.io ·  linkedin.com/in/mtanneau ·  Atlanta

Operations Research enthusiast and thought leader with 10 years of experience developing state-of-the-art optimization algorithms and building scalable decision-making systems. Skilled in translating business needs into technical roadmaps, I create impactful solutions by combining my expertise in machine learning and optimization with my software engineering skills and ability to lead high-impact projects end-to-end.

TECHNICAL AND POWER SKILLS

- **AI & Optimization:** mathematical modeling and optimization (linear, convex, nonlinear optimization), optimization algorithms (first-order methods, interior-point), decomposition techniques, machine learning, physical AI
- **Scientific Computing:** large-scale data processing, linear algebra, high-performance computing, GPU acceleration
- **Software development:** python, Julia, C/C++, Git, CI/CD, Agile, software profiling and benchmarking
- **Languages:** French (native), English (bilingual), Spanish (intermediate)

EXPERIENCE

Research Software Engineer

May 2025 – Jan 2026

Center for Scientific Software Engineering, Georgia Tech

Atlanta, GA

- Identify stakeholders' needs and translate them into technical milestones and roadmaps
- Provide subject matter expertise on AI and HPC topics (machine learning, distributed computing)
- Develop semantic search for nature images using vector database technology; accelerate neural network verification using multi-GPU parallelism; improve foundation models for remote earth sensing

Research Engineer II

Fev 2023 – Jan 2026

NSF AI Institute for Advances in Optimization (AI4OPT), Georgia Tech

Atlanta, GA

- Manage portfolio of Energy Systems projects at AI4OPT by engaging with industry and government stakeholders to identify critical business needs and define technical roadmaps, overseeing scientific progress, and communicating scientific milestones to non-technical stakeholders and decision-makers
- Lead cross-functional team of 10+ international researchers; recruit, advise and mentor students
- Accelerate optimization algorithms using machine learning and advanced computing architectures (GPU)
- Author multiple publications in top international venues (ICML, NeurIPS, PSCC) on physical AI, time series forecasting, and accelerated decision making using machine learning and optimization

Post-doctoral Fellow

Fev 2021 – Jan 2023

School of Industrial and Systems Engineering, Georgia Tech

Atlanta, GA

- Lead the development of an AI-based digital twin of a major U.S. Independent System Operator using large-scale data processing, probabilistic forecasting, optimization and machine learning technology
- Orchestrate software development and integration by enforcing software engineering best practices and setting up CI/CD pipelines on enterprise infrastructure across 50+ code repositories
- Accelerate nonlinear optimization algorithms by up to 1000x using self-supervised machine learning
- Regular contributor to open-source optimization tools (JuMP.jl, PowerModels.jl, Tulip.jl)

EDUCATION

Ph.D., Applied Mathematics

2017 – 2020

Polytechnique Montreal

Montreal, QC, Canada

- Thesis: *Exploiting Structure in Mixed-Integer Linear and Nonlinear Programming*
- Courses: Mixed-Integer & Combinatorial Optimization, Stochastic Optimization, Reinforcement Learning
- PhD student representative in GERAD research group (400+ graduate students) in 2017 and 2018

M.Sc Engineering

2012 – 2016

Ecole polytechnique

Paris, France

- Advanced multi-disciplinary scientific curriculum (math/physics/CS) in France's top engineering program
- Courses: Operations Research, Signal processing, Quantum and Statistical Physics



PUBLICATIONS

Full list of publications: <https://scholar.google.com/citations?user=69NakqoAAAAJ>

- G. Qiu, **M. Tanneau**, P. Van Hentenryck. Dual Conic Proxy for Semidefinite Relaxation of Optimal Power Flow. *I/SE Annual Conference 2025* (energy systems track best paper). Preprint: <https://doi.org/10.48550/arXiv.2502.06978>
- **M. Tanneau**, P. Van Hentenryck. Dual Lagrangian Learning for Conic Optimization. *Advances in Neural Information Processing (NeurIPS) 2024*. <https://doi.org/10.52202/079017-1764>
- K. Wu, **M. Tanneau**, P. Van Hentenryck. Strong Mixed-Integer formulations for transmission expansion planning with FACTS devices. *Electric Power Systems Research* 235, Oct 2024. <https://doi.org/10.1016/j.epsr.2024.110695>
- A. Lodi, **M. Tanneau**, J.P. Vielma. Disjunctive Cuts in Mixed-Integer Conic Optimization. *Mathematical Programming* 199, 671–719 (2023). <https://doi.org/10.1007/s10107-022-01844-1>
- M. Anjos, A. Lodi, **M. Tanneau**. Design and implementation of a modular interior-point solver for linear optimization. *Mathematical Programming Computation*. 13, 509–551 (2021). <https://doi.org/10.1007/s12532-020-00200-8>



OPEN-SOURCE SOFTWARE

Full list of open-source contributions: <https://github.com/mtanneau>

PGLearn.jl

<https://github.com/ai4opt/PGLearn.jl>

Data generator for Optimal Power Flow instances

- Oversee software development and data pipeline integrations
- Build and maintain documentation, manage issues and pull requests

Tulip.jl

<https://github.com/ds4dm/Tulip.jl>

Open-source interior-point solver for linear programming

- Lead algorithmic design and software architecture/integration, build and maintain documentation
- Develop modular linear algebra framework with support for arbitrary arithmetic
- First Julia-based solver to be featured in Pr. Hans Mittelmann's benchmark

PowerModels.jl

<https://github.com/lanl-ansi/PowerModels.jl>

Modeling and data manipulation tool for power systems optimization

- Accelerate computation of Power Transfer Distribution Factor matrices >10x using sparse linear algebra techniques
- Improve performance of data processing pipelines (2x speedup)

JuMP.jl

<https://github.com/jump-dev>

Modeling language for mathematical optimization in Julia

- Regular contributor to solver wrappers (Clp, Tulip, cuOpt) and backend software (MathOptInterface)