

Enterprise AI for Better Decisions as a Service

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Algomia is your B2B forge to solve, simplify, and automate your resource allocation decisions with Optimization AI as a Service.

Resource allocation burdens businesses

Complex rules are cumbersome to fulfil, hard to standardize, and yield high planning overhead.

Yet, good or bad allocation decides on won or lost revenue.





SBB CFF FFS

Success Story: Crew Scheduling

massive planning challenge

per planning day swiss-wide
20000+ train legs
1000+ shifts



3000+ train drivers
70+ depots

Impact



alGomia



Business Pain/Need	Without Algomia	With Algomia
Cost reduction	Potential not found because planning is too complex by hand.	Multi-million savings potential by 2% fewer but more productive shifts.
Effort of the planning	30+ planners busy for 6+ months . Need to plan, check, and re-plan by hand .	2-3 days for an optimization run. All labor rules respected automatically .
Strategic planning	Variants almost impossible due to high planning effort.	The optimizer evaluates various planning philosophies in due time.

Number Crunching

Optimization model has 1.3+ billion variables. All required constraints are captured.



1.3 bn
variables

Our AI algorithms solve the model within only 43h of compute time on community hardware.



43h
compute time

The solution has a provable optimality gap of only 1.9% and shows significant undisclosed savings.



1.9%
optimality gap

“

Algomia's optimizer is both seamlessly integrated with the existing planning software and is able to be deployed independently.

The runtime and quality of results open up new opportunities on how we can approach our daily business.

Product Manager, SBB

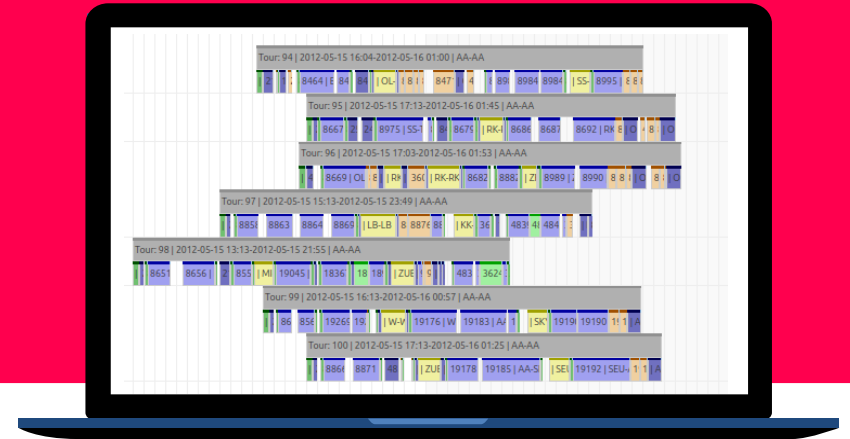
 SBB CFF FFS

The optimizer eases and speeds up the planning significantly ...

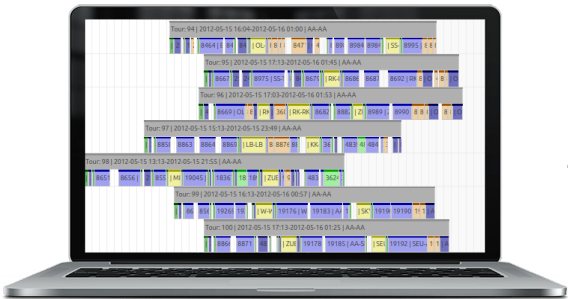
Optimization AI as a Service

Algomia's cutting-edge optimization engine is designed to solve the most intricate and massive scheduling challenges.

No hidden biases, since the model does not require training



Optimization API



REST API



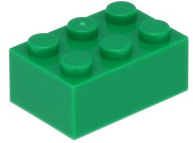
The solution to the resource allocation challenge is just a request away



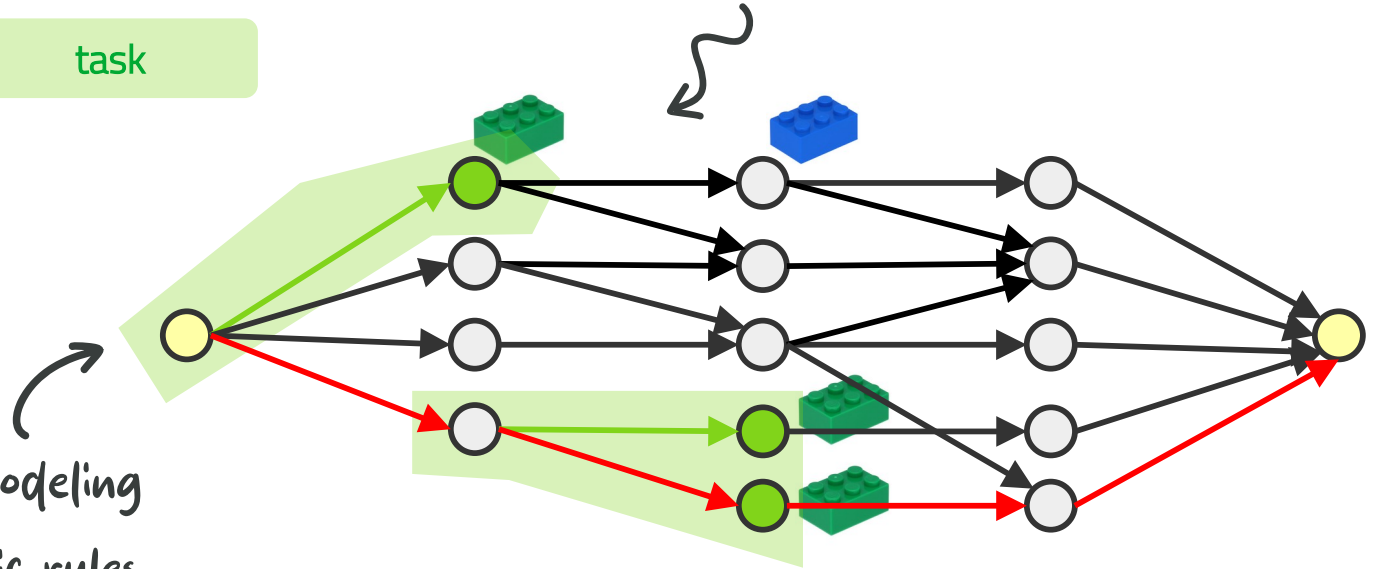
We operate the optimizer, either on our infrastructure or on premise

Optimization Model

These models can be massive – billions of transitions



task



Flexibility in modeling use-case specific rules



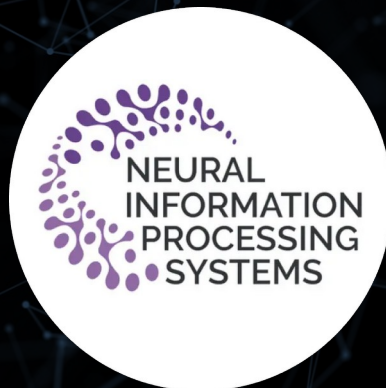
task sequence

Technology

Our mathematically sound technology provides solutions with provable optimality guarantees - fast.

Scalability is incorporated algorithmically by column-generation and by cloud deployments.

See our recent abstract at the leading AI conference NeurIPS 2025 ScaleOPT Workshop



A Flow-Based Solver for Large-Scale Combinatorial Optimization

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Abstract

We report on our design, implementation, and computational results of a new flow-based solver for combinatorial optimization. The technology is capable of solving very large instances having up to billions of graph-edges within days and accuracy of $1 - 2\%$, consistently. The results have been validated on real-world instances occurring in the Swiss railway industry.

1 Introduction

Combinatorial optimization has proved time and again, to be an extremely useful method for deriving *better decisions*, whenever scarce and constrained resources have to be allocated, see, e.g. [1]. Typical areas of industrial use-cases include transportation, logistics, healthcare, finance, technology, defense, and more. A common problem is *combinatorial explosion* at growing problem-sizes, which limits the scalability of algorithms. Given the usefulness of the combinatorial optimization approach, the need for large-scale solvers becomes evident.

The present paper reports our current engineering progress in designing, implementing, and operating a flow-based solver for large-scale and real-world combinatorial optimization. The solver has been tested extensively at the Swiss Federal Railways (and other customers), see Section 2. The challenge there was to optimize the crew shifts of the train-drivers across the entire country. This is a massive scheduling problem, and our instances feature graphs with billions of edges. We could solve these problems with high quality, i.e., optimality gap usually around $1-2\%$, consistently and within few days of computation time, see Table 1. Our largest instance has 2.3 billion edges and was solved to an accuracy of 4.1% within 104 hours. This was a substantial breakthrough, since the methods applied previously did not scale accordingly.

Our main design goals and decisions, see Section 3 have been:

1. We require that the solver is applicable to a broad variety (if not all) of combinatorial optimization problems, with reasonable modeling efforts. Our answer to this is to formulate any combinatorial optimization problem in terms of SET CONSTRAINTED FLOW, which extends network flows with additional edge-set constraints.
2. Many real-world use-cases have *locality* and *globality* properties, that shall be supported in the modeling. There is a clear separation between groups of constraints that link resources at a narrow perspective, e.g., precedence requirements for tasks, and groups of constraints that have to hold at a high level view, e.g., task coverage requirements. In our approach,

Getting Started

Concept and
analysis phase

The solution is validated with
experts on real data



**Minimal lovable
optimizer with
initial data**

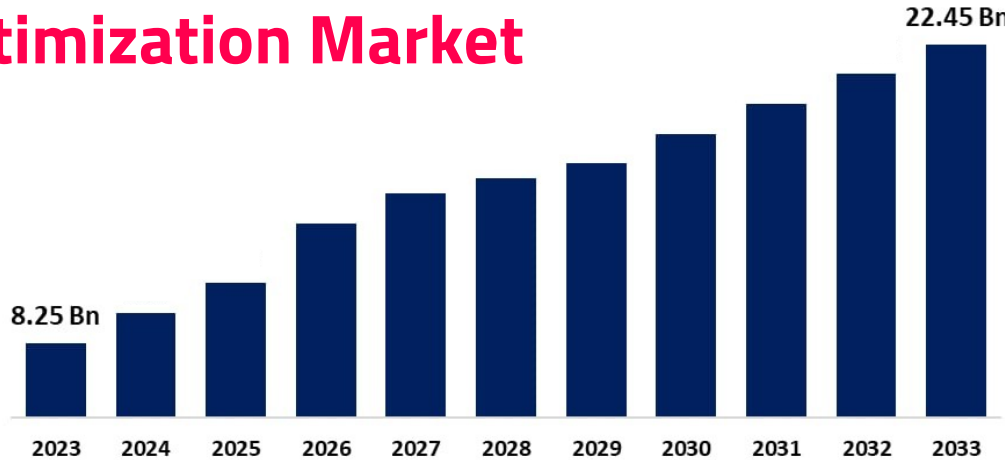


**Customer fitting
project and
implementation**



**Benefit from
Optimization
as a Service**

Global Workforce Optimization Market



Diverse and stringent regulatory labor laws enforce compliance and foster automation.



Present Value

8.25 BN\$

in 2023

Growth

10.53% CAGR

from 2023 to 2033

Estimated Value

22.45 BN\$

by 2033

Algomia Team



Alexander Souza
CEO, Expert & Engineer



Ori Chen
Commercial Lead



Tristan Koning
Junior Engineer



Jan Fülischer
Advisor



Dominique Septinus
Law & IP Advisor





Madhur Agrawal
GTM Advisor

Differentiation

We are the only vendor with
proven large-scale capability



Company	Use-Case Focus	Main Verticals	Planning Focus
ALGOMIA	workforce, large-scale	rail	long- & mid-term
 timefold	routing, workforce	logistics, automotive	near real-time
solvice	routing, workforce	logistics	near real-time
 aspaara	resources	automotive	long- & mid-term

Business Model

Translating business challenges into optimizations models and validating the solutions

Consulting

On premise deployments, customizations, enterprise clients

Licenses

Solution operated by Algomia on its infrastructure, configurations, midmarket customers

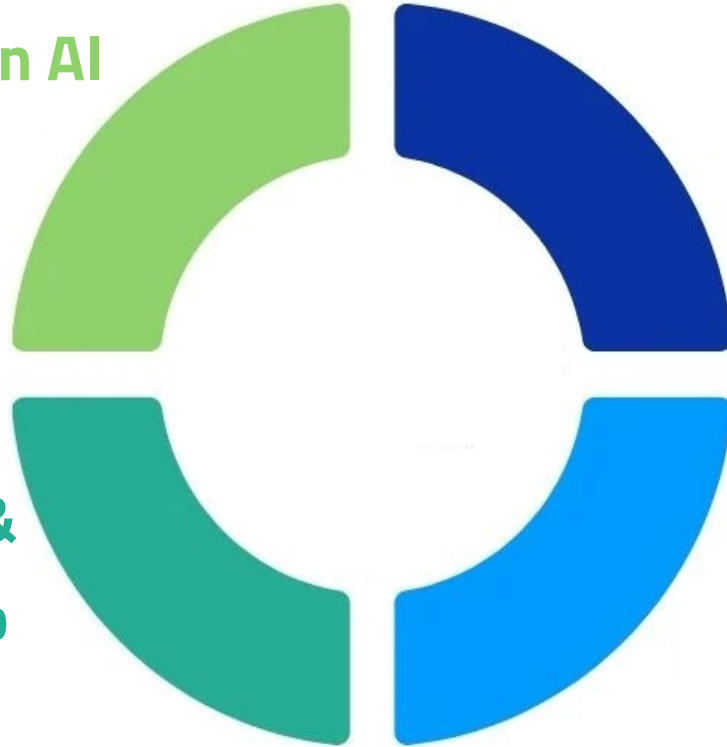
Subscription



Go To Market Strategy

Focused product → **Optimization AI
as a Service**

*Venture
clienting* → **Outbound &
Partnership
Channels**



Large, fragmented market →

**Resource
Optimization
Market**

**Consulting,
Licenses &
Subscription**

About Algomia

Company

GmbH Incorporated, 2021

Bootstrapped and debt-free

Focus Optimization AI as a Service

Recognition

Sword Startup Challenge Finalist, 2025

Top 150 Innovatoren Schweiz, 2025

NVIDIA Inception Program, 2024

DB mindbox Winner, 2023

Innosuisse Coached, 2022

Swiss Innovation Challenge Rank 4, 2022

Winner Smart City Challenge Winterthur, 2021



HACK WINTERTHUR



Dr. Alexander Souza

Founder & CEO

Alexander has many years of professional experience in the optimization and software industry.

He holds a doctorate degree from the ETH Zurich and is a lecturer for algorithms at the University of Zurich.



Customers

Current customers
using Algomia
optimizers



Onboarding customers
with won joint tender
or venture clienting
agreement

Use Case Rail Crew Scheduling

Train legs are to be scheduled into crew shifts, respecting complex labor rules.



SBB CFF FFS



Use Case Cargo Rail Rostering

Cargo drivers have to be rostered,
covering the demands of tours,
respecting complex labor rules.

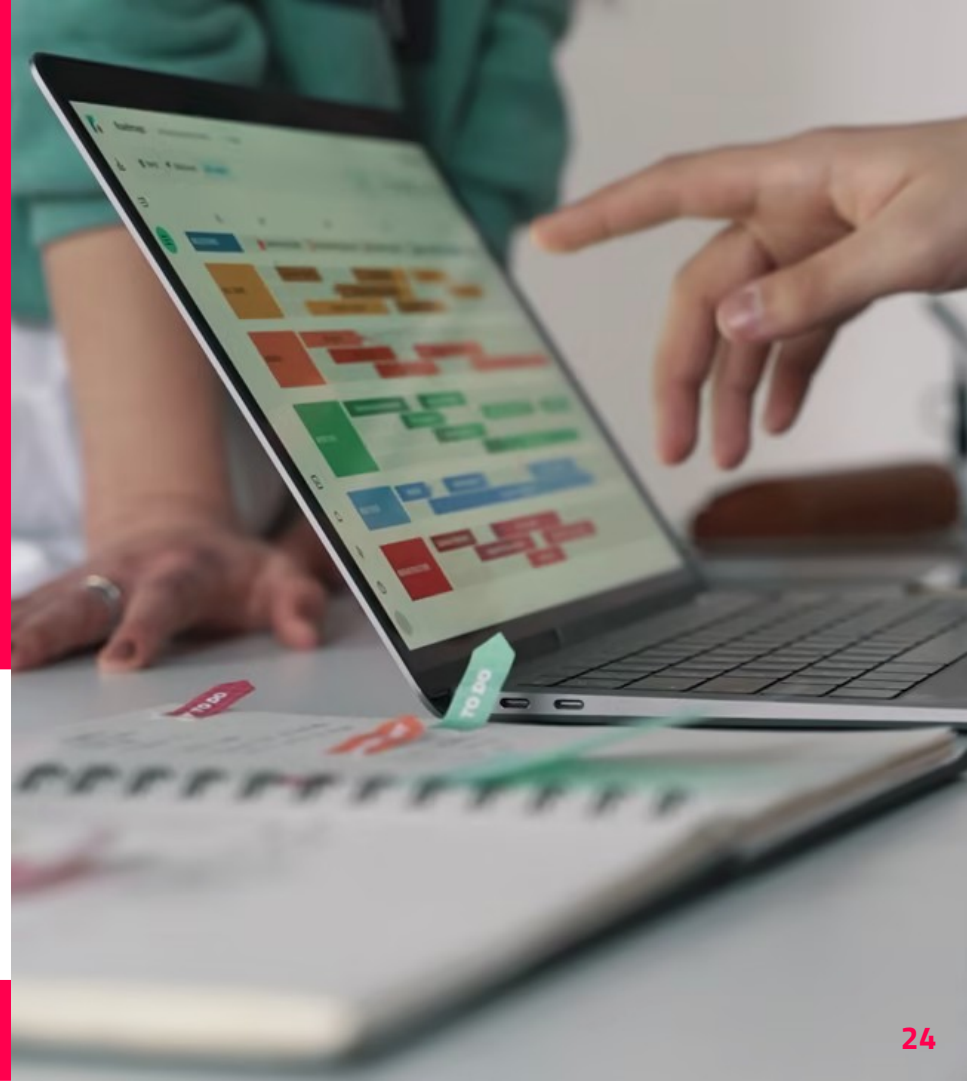


Use Case Duty Scheduling

Duties must be scheduled on workforce, which is qualified and available, respecting labor rules and preferences.



GRAND CASINO
BADEN



Use Case Transport Chains

Transport chain optimization of cargo waggons. Greenfield IT Framework. Minimal viable product project.



SBB Cargo



Use Case Inventory Optimization

Match articles to warehouse locations. Inventory optimization yields 27-30% less pick-and-pack distance by Algomia optimization.



FIEGE



Use Case

Waste Reuse

Waste of some production may be raw material of another. Our AI optimizes the waste streams minimizes landfill, won the Smart City Challenge of Winterthur.



HACK WINTERTHUR
POWERED BY NOSER ENGINEERING



“

*We have the optimization
knowledge and the **rock**
technology to ~~solve~~ your
resource allocation challenge.*

ALGOMIA

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