

# Cargo Simulator

## Trustbit Cargo Simulator

A simulation helping to explore benefits of digitalisation and AI/ML in logistics. Focusing on synergies between logistics, supply chains and sustainability.

## key elements of the simulation model

**This simulation is a digital model of an international transport logistic system. It includes:**

- **World map**, representing major transportation hubs and connections.
- **Automated truckload companies** managing fleets of trucks to deliver cargo between locations.
- Self-balanced **open market model for customers and cargo**, including interdependent supply chains.
- Deterministic **event-driven simulation** capable of running hundreds of competing agents in the same world.
- **Sustainability computations** by simulating work hours, driver fatigue, incidents, computing CO2 emissions (COPERT and DIN) and carbon offset costs.
- **Passing of time** to represent truck travel times, delays, yearly and weekly patterns, transport schedules, traffic congestions and location open hours.
- **Monte-carlo simulations** to compute ETA, kilometrage and sustainability profiles for transports within the simulation.
- Support for **custom agents** to act as truckload companies, truck fleet drivers, and other parties in the supply chain. This enables experiments tailored for your scenarios and criteria.
- **Baseline agents** focusing on the criteria of efficiency and sustainability.
- **Real-time simulation dashboards** that provide insight into the simulation: CO2 emissions, empty kilometrage, revenue streams, customer lead times, cargo delivery margins and truck wait times.
- **Graphical visualization** displays simulated & historical transports on a real map. Key simulation properties like ETA, kilometrage and CO2 emission profiles are visualized as well.
- **Synthetic data generation** pipeline, including GPS traces.

# key features of the simulator

## Mapping GPS Data

Mapping GPS traces to roads, including computing the time a truck spent on a particular road.

## Robust Simulations

Using Monte Carlo simulation to obtain highly robust simulation results

## Fine Tuning Company Data

Fine-tuning simulation to your company using data from historic transport journeys, GPS traces and cargo flows

## Multimodal & LTL

Simulation extensions for multimodal transports and less-than truckload (LTL) workflows

## CO2 Emission Computation

CO2 computation according to COPERT and DIN *(not yet certified)*

## Work In Progress: Multimodality

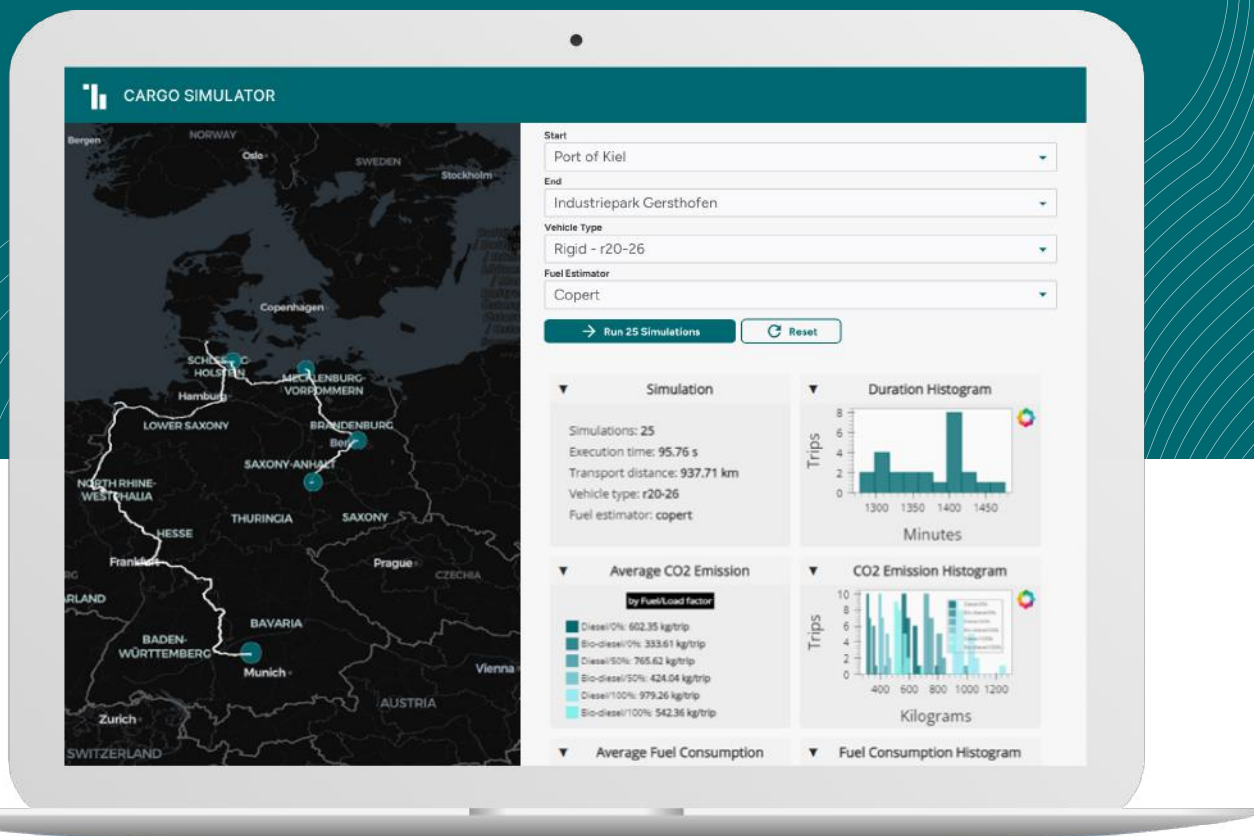
Supporting the simulation of multi-modal journeys (truck + train)

## Electric Vehicle Simulation

Support of electric vehicles, charging stations and last-mile delivery scenarios

## Data Generation And Reinforce Learning

Infrastructure for a data science department (on-the-premises or in the cloud) using logistic simulation for data generation and reinforcement learning



## additional use cases

### **Industry Hackathons**

Industry Hackathons organised with this logistic simulation attract the top talent and boost company visibility. Attendees quickly fill all available slots before the Hackathon and request its extension after the event is over.

Since the simulation runtime is designed run equally well on-the-premises and in the cloud, extensions and online-only attendance can be accommodated.

### **Help Executing Data Strategy**

Synthetic data can be changed at its root more easily, than the real historic data of a company. This could help to execute data strategy: practically evaluating various implementation options, prototyping data warehouses and filling them with data, stress-testing IT systems.

### **Generating Diverse Synthetic Data**

Simulation is capable of generating diverse synthetic data with realistic patterns but without any personal information. Such synthetic data opens new collaboration options with research institutes and external software vendors.

Got questions? We're looking forward to hearing from you!

Get in touch with

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