



**Infinite Foundry**  
3D Digital Plant

# FROM INDUSTRIAL OPERATIONS TO REAL-TIME INTELLIGENT CONTROL

The Operational Control Platform  
powered by Digital Twins



2026

# INDEX

*Feel free to jump straight to the section of interest*



- The Problem**
- Impact**
- Our Clients & Partners**
- Other companies Results**
- Why our Digital Twin is better**
- Key Differentiator – Our Virtual Sensors**
- Us and our mission**
- Industry Types**
- Logistics, Warehouses & Ports**
- Manufacturing & Automotive**
- Energy & Critical Infrastructure**
- Defense & Dual-Use Applications**
- Healthcare**
- Infinite 2.0**
- Scanning & Modeling**
- Remote Control & Remote Operations**
- Virtual Training**
- Ergonomics & Human-Centered**
- Virtual Tours**
- Implementation Approach & Next steps**

*Reading time: ~15–20 minutes*

# THE PROBLEM

Why monitoring alone isn't enough



# WHAT THIS CHANGES FOR YOU

From squeezing efficiency out of the past to creating competitive advantage for the future. **-In the first 12 months-**

## Operational impact:

- 20-40 ⚡ *downtime*
- + 10-25 ⚡ *throughput*
- 30-50 ⚡ *scrap*
- + 10-25 ⚡ *productivity*

## Business impact:

ROI in **6-12 months**

Ability to operate with **fewer physical sensors**

**Sustainable margin growth through differentiation**

# Traditional Digital Twin

## What are so-called 'traditional' Digital Twins

Often: static 3D model  
or dashboard overlay

✗ Offline

Limited scenario testing

✗ No action

Mostly offline, after-the-  
fact historical analysis

✗ After-the-fact

Rarely closes the loop to  
decision + action



Most so-called 'traditional digital twins' are the result of traditional digitalisation.

In Industry 4.0, many so-called digital twins are **essentially reporting tools that analyze historical data.**

**This lack of real-time intelligence makes them static, reactive, and unable to support critical operational decisions.**

# Simulate and reprogram operations

*Safely and in real-time*

## 3D + Natural Language Interface

**Ask:**



“What if demand increases 20%?”

**See:**



Impact on **throughput, quality, energy and bottlenecks.**

**Apply:**



Automatic parameter updates (machines, robots, workflows)

Approach	Limitation
Siemens / Dassault / PTC	powerful, but complex, expert-only
Consulting Projects	manual, slow, non-continuous
SCADA/MES	No simulation, no “what if” analysis
<b>Infinite Foundry</b>	<b>Simulate &gt; Decide &gt; Deploy automatically</b>

# Operational Intelligence & Control Platform

Digital Twin Core



High-accuracy 3D replica

Real-time synchronization (*IoT, Cameras, IT/OT*)

Physics-based virtual sensors (*Hybrid AI/CFD/FEM*)

Simulation & scenario testing (*what-if*)

Closed-loop control & automatic reprogramming

# Why ours?

! We are not a Digital Twin visualization company. !

We are **ONE** control platform.

We measure what sensors cannot



virtual sensors

We decide what to do next



simulation + optimization

We execute automatically



PLC+ robots + operator guidance



The Digital Twin becomes an active operational system – not a dashboard.



# How it works

## Our Model - The real version of Digital Twin



# Key Differentiator

## Our Virtual Sensors

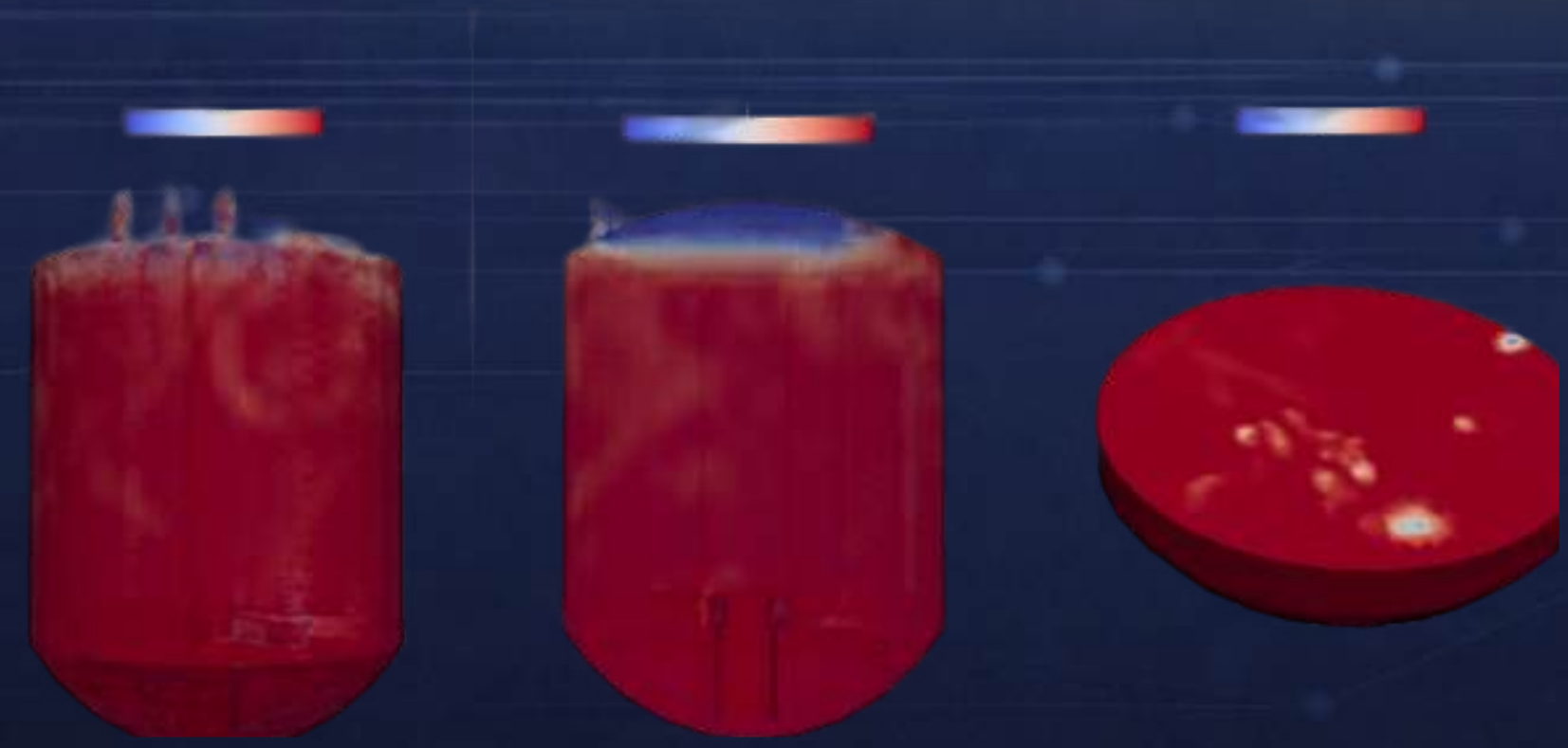
Software-based sensors powered by physics-based models

Combine operational data, constraints and live signals

Work in legacy & restricted environments

Eliminate the need for massive physical instrumentation

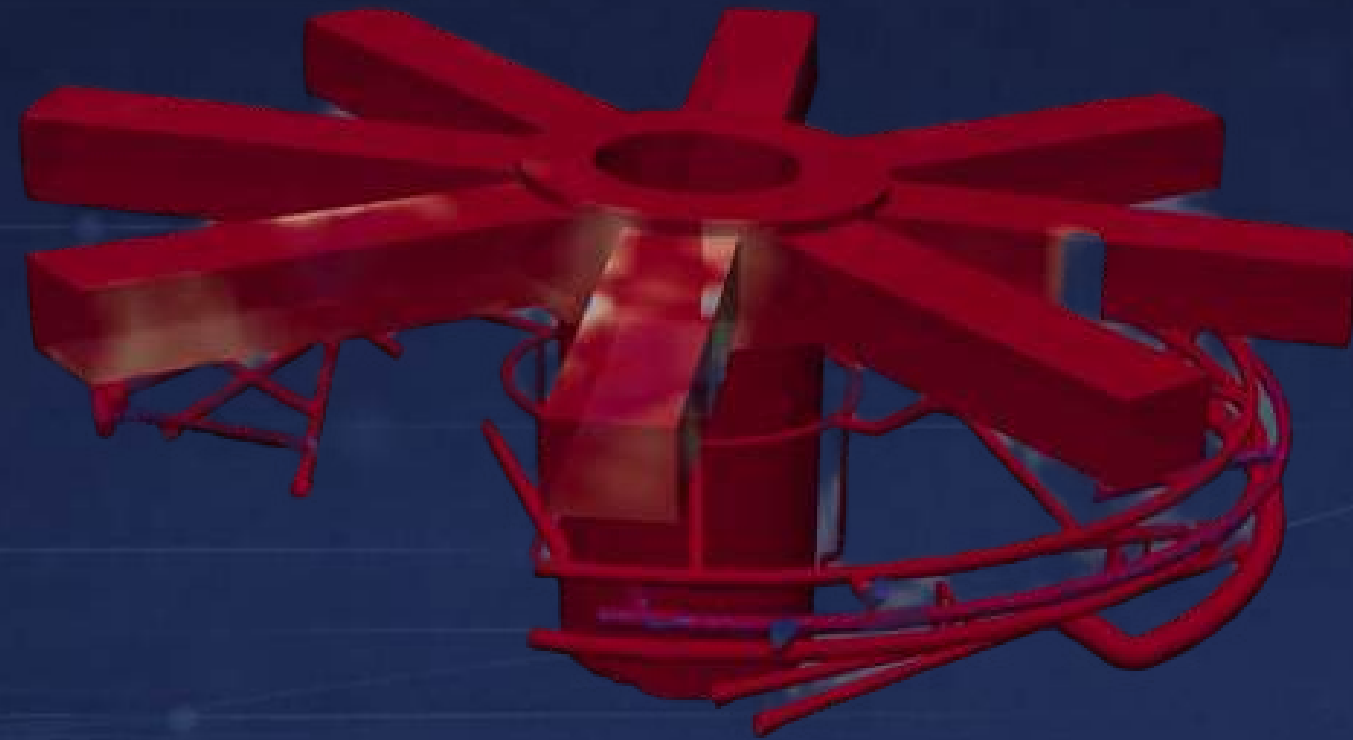
*Virtual Sensors*  
*Physics Based AI*



-  *More Data*
-  *Less Waste*
-  *More Control*

Virtual Sensors are what makes closed-loop precise control possible even in sensor-limited environments.

**Why it matters**



Orders of magnitude more operational data

Full observability of otherwise invisible variables

Much tighter process control

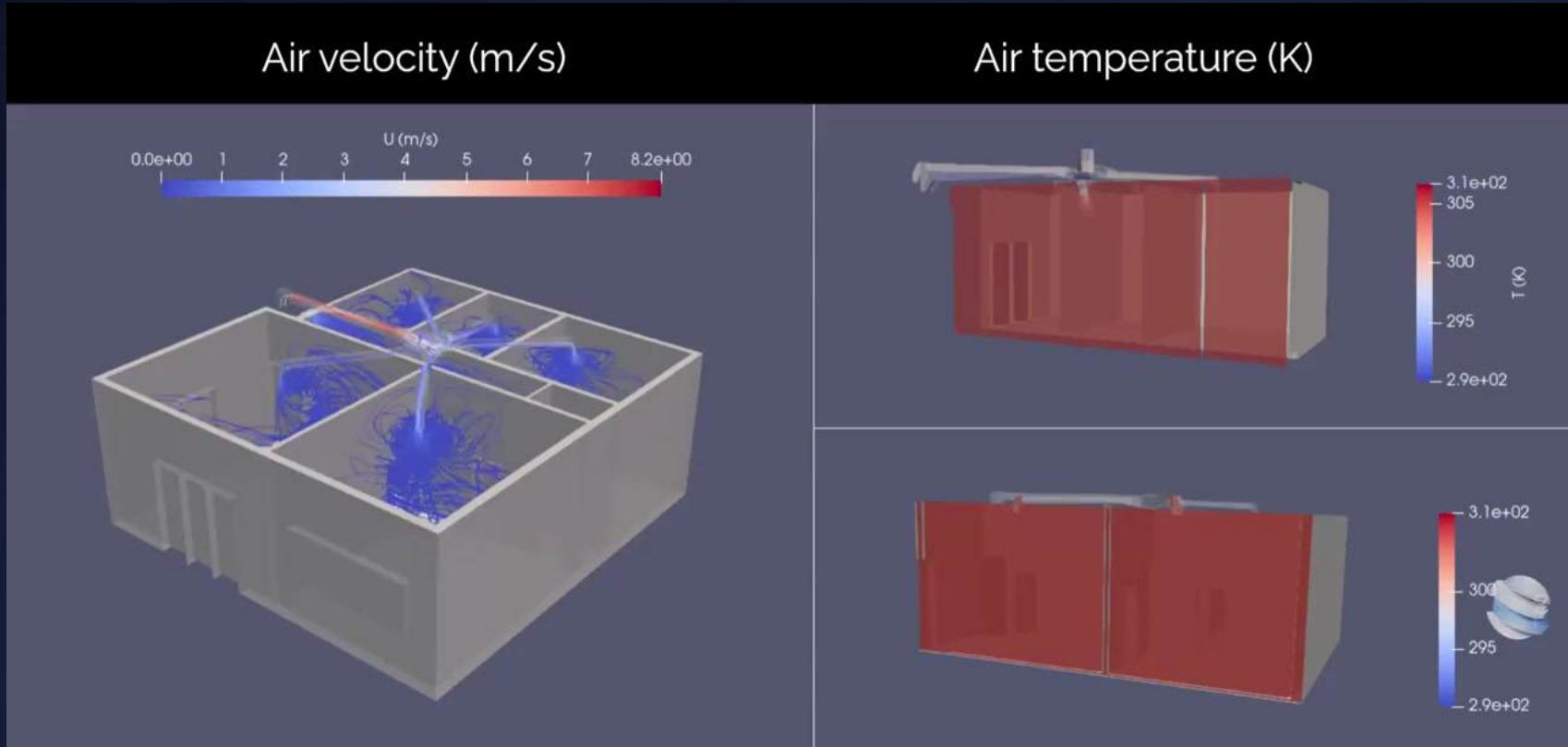
Errors, scrap, and waste eliminated at the source

BACK ◀

# Virtual Sensors

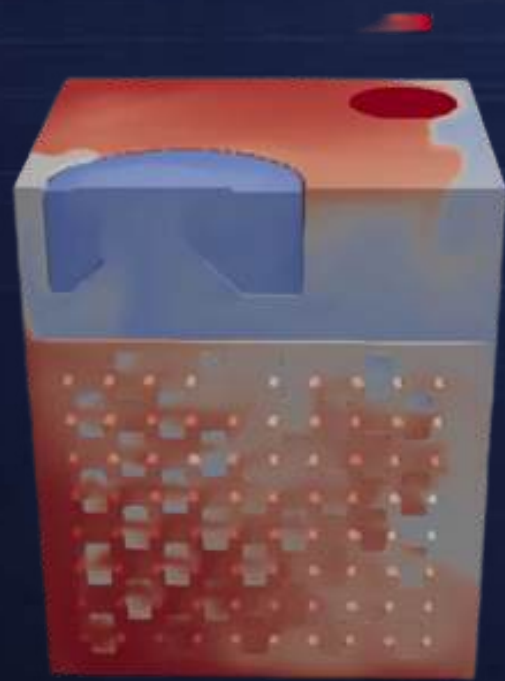
## Virtual Sensors powered by Physics-based Simulation (CFD)

WATCH VIDEO 

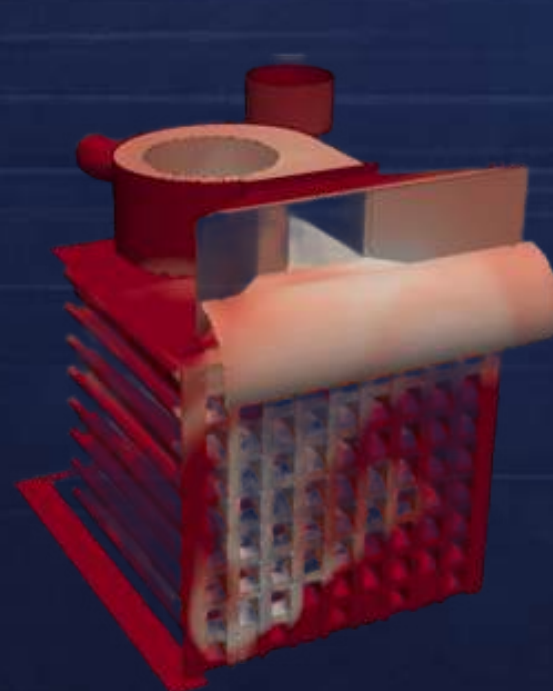


Our solution combines Computational Fluid Dynamics (CFD) with real operational data to create **high-precision virtual sensors**.

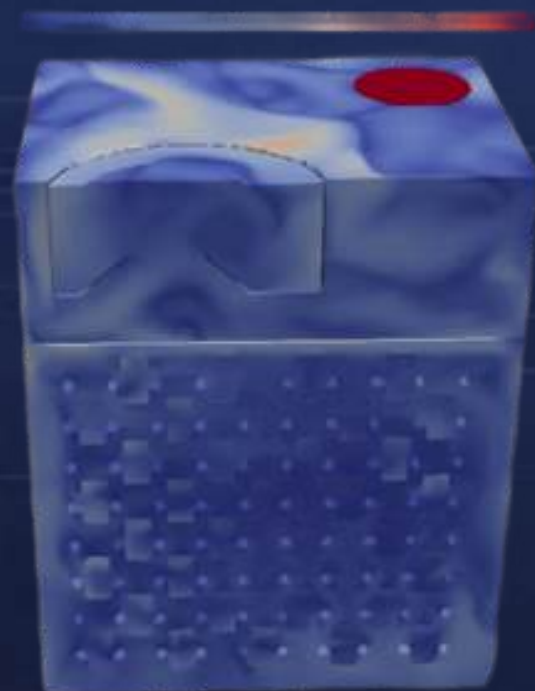
- Measure critical variables that are hard or costly to instrument physically
- Predict temperature, pressure, airflow and dispersion before issues occur
- Optimize processes without trial-and-error on the real system



Chamber internal temperature



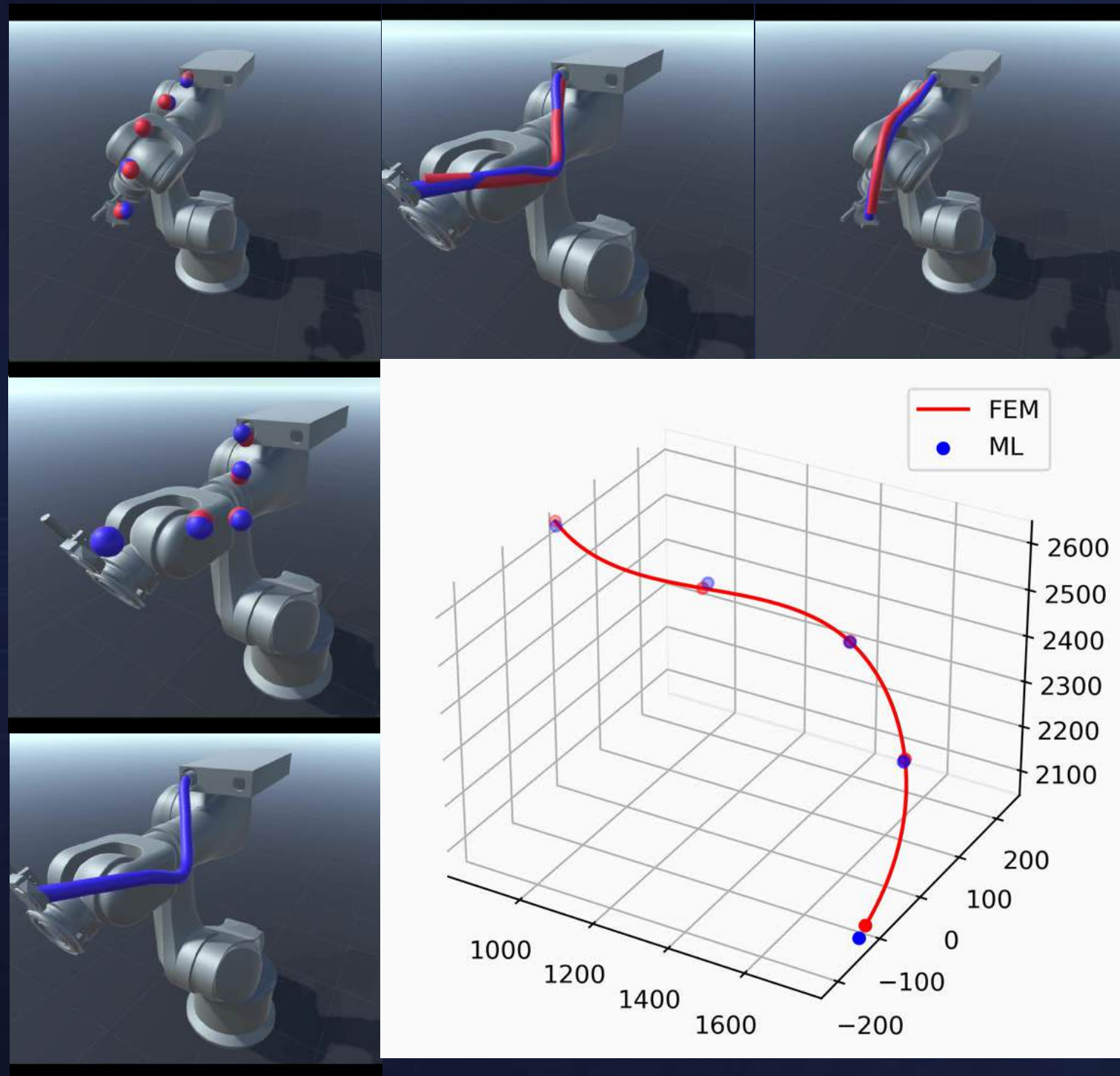
Component temperature



Airflow velocity inside the chamber

By injecting **CFD results** directly into the 3D Digital Twin, we enable **real-time insight, failure prevention and continuous optimization** – even in **complex and dynamic environments**.

BACK 



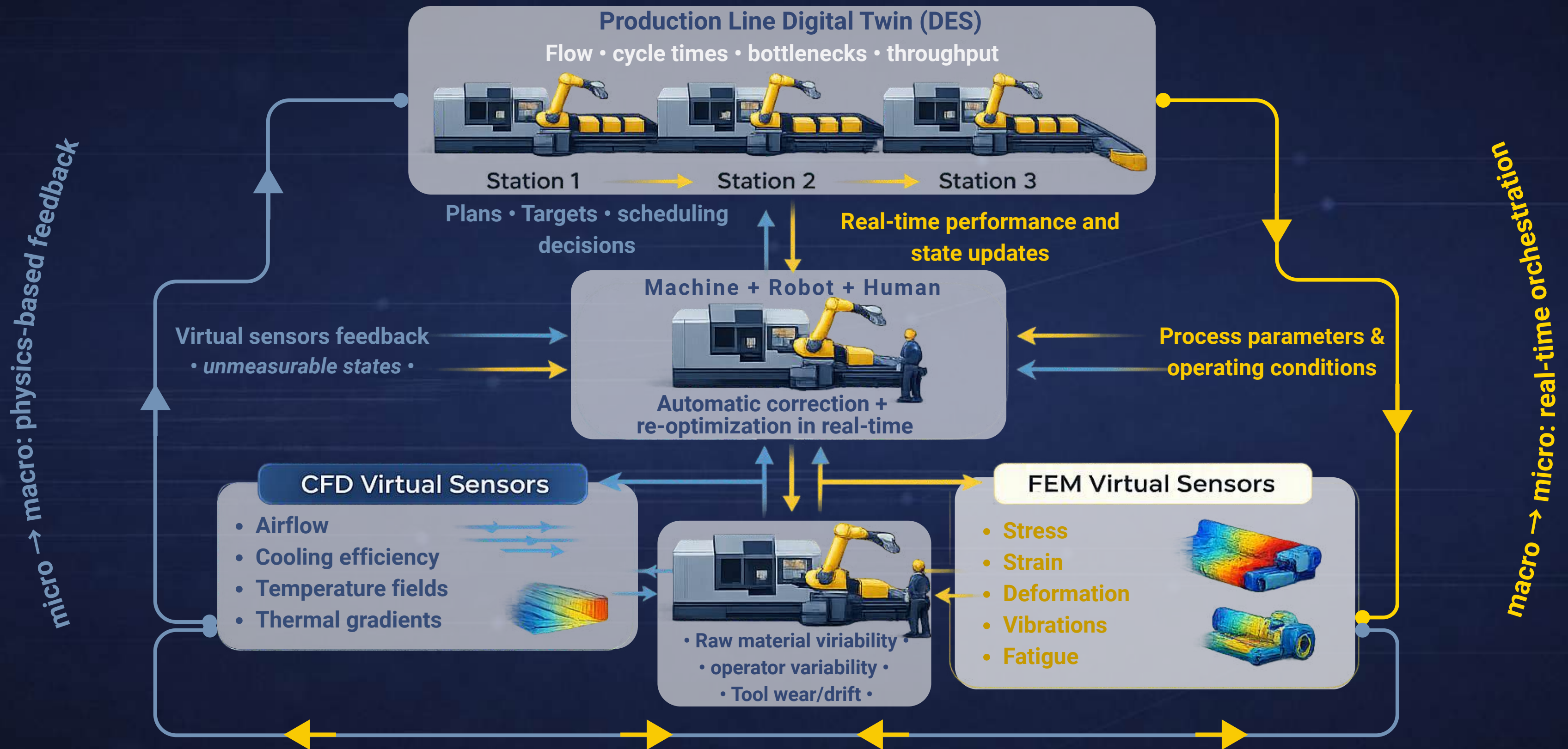
We use Finite Element Analysis (FEA) to model how mechanical systems behave under real-world conditions: **stress, deformation, vibration and fatigue.**

By combining physics-based models with Machine Learning, we are able to:

- Accurately predict structural behavior
- Reduce simulation time from hours to seconds
- Enable real-time analysis inside the Digital Twin

This allows engineering and operations teams to **design safer systems, optimize performance** and **anticipate failures before they happen.**

# Line-level Digital Twin models what happens in the entire production line & Physics-based virtual sensors model what happens inside each workstation



Competitive advantage emerges when micro-level physics informs macro-level orchestration – in real time.

- Founded 2017
- HQ Porto (PT) + Brazil
- 40 employees | 10 R&D
- €3.5M revenue (2025)



*Porto, PT (HQ)  
AI & Simulation*

*Vitoria, BR  
R&D*

*São Paulo, BR  
Modelling & Animation*

# MISSION

GREEN



DIGITAL



LEAN



FLEXIBLE



EFFICIENT



Make Industrial systems

BACK

measurable, predictable & optimisable in real-time

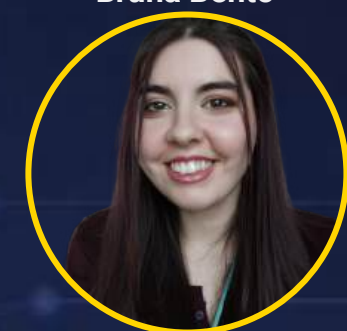
# Infinite Foundry Portugal

## Our Amazing Team

General Manager  
André Luz, PhD



Operations & International  
Projects Manager  
Bruna Bento



Vasco Ferreira, PhD  
Technical Manager



Maria Ribeiro  
Sales & Customer  
Success Manager

Sara Oliveira  
Project & Team Manager



Juliana Magalhães  
Project & Team Manager



Ana Pinto  
3D Software Engineer



Guilherme Tavares  
Product Manager

Karyna Yurchenko  
CG Generalist



Rafael Neves  
Digital and Smart Factory  
Engineer

Fábio Ferreira, PhD  
Data Scientist



David Carvalho, PhD  
Simulation & Data Specialist

Diogo Campas  
Computer Vision &  
Machine Learning Specialist



Maria Inês Cabral  
3D Graphic Designer  
& Developer

Mário Travassos  
3D Software Engineer



Frederico Proença  
3D & UX/UI Designer

Gonçalo Alcobia  
Physical  
Simulation Specialist



Diogo Simões  
Parallel Computing  
Specialist

José Lopes  
Real-Time 3D & Geospatial  
Reconstruction Engineer



Manuel Ferreira  
Digital and Smart Factory  
Engineer

# Trusted in industry and innovation networks

# Our Clients & Partners



# THE SOLUTIONS OF OUR DIGITAL TWINS

## 1. Data & Integration

- Unified data layer
- Real-time synchronization
- Automatic anomaly detection
- Single source of truth

## 10. Security & Trust

- Secure architectures
- Data governance
- Edge processing

## 9. Costs & ROI

- ROI-focused offerings
- Deployment in weeks
- Savings KPIs
- Vertical solutions

## 8. AI Readiness

- Context-rich twins
- Physics-informed ML
- Explainable AI
- Synthetic data generation

## 2. Predictive Maintenance

- Physics + AI hybrid
- Remaining Useful Life (RUL) prediction
- Self-learning twins
- Failure simulation

## 7. Training & Knowledge

- Training twins
- Virtual commissioning
- Knowledge capture

## 3. Decision-Making

- Scenario simulation
- Operational stress tests
- Digital trials
- Optimization engines

## 4. Scalability

- Twin-as-a-Service
- Modular models
- Cloud & edge-ready
- Rapid deployment pipelines

## 5. Sustainability e ESG

- Carbon-focused twins
- Energy optimization
- Lifecycle simulation
- Compliance automation

## 6. Interface & User Experience

- Natural language interaction
- AI copilots
- AR/VR visualization
- Role-based interfaces

# The most **precise operational control platform** in the market

We are the most precise operational control platform in the market – because **we can control** what cannot be physically measured, **simulate any scenario**, and **automatically execute changes** in a **closed-loop** system.



# Who We Work With

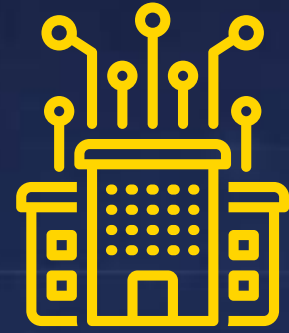
*Typical Partners & Clients*



*Logistics & ports*



*Manufacturing & automotive*



*Infrastructure operators*



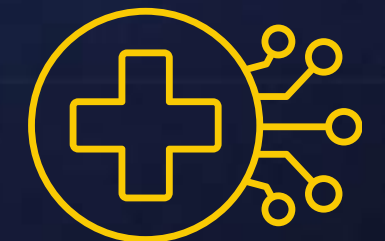
*Industrial ecosystems & institutions*



*Energy & utilities*



*Defense*



*Healthcare*

BACK ◀

Warehouse &  
inventory digital  
twins

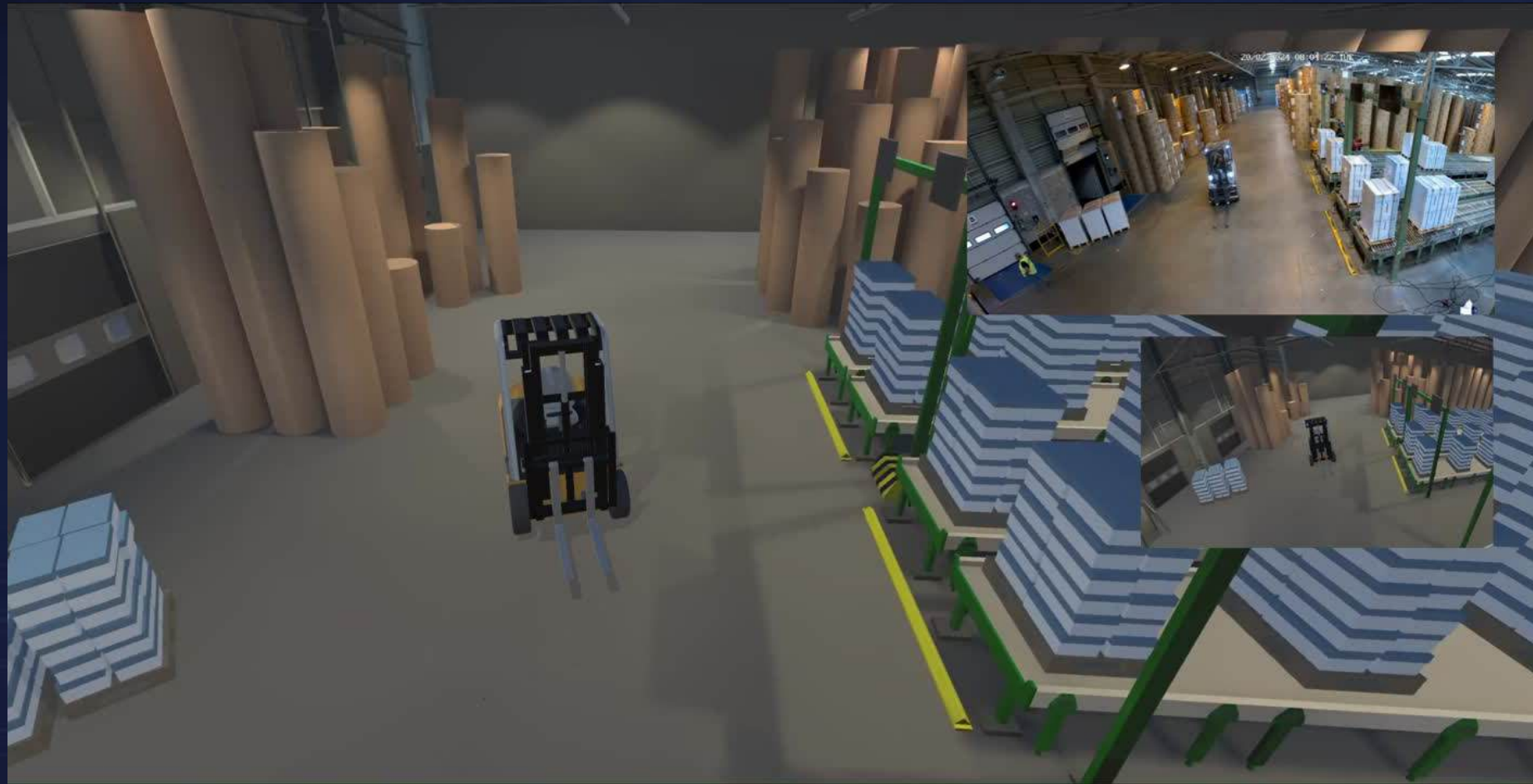
Fleet & yard management

Scenario planning for  
demand changes

Bottleneck  
identification

Route & flow optimization





### Autonomous Mobile Robot (AMR) + Digital Twin:

Real-time coordination of mobile robots through simulation and live data.

Optimized routes, fewer delays, safer operations and higher throughput – without disrupting production.



This video shows a live 3D Digital Twin of an industrial port terminal, where operators can visually monitor conveyors, equipment, and material flows in a single environment.

The platform **connects operational data to the 3D model**, enabling **remote supervision, status tracking**, and faster response to **incidents or bottlenecks**.

Before making changes on site, teams can **simulate scenarios in the Digital Twin** to assess the **impact on safety, throughput, and operations**.

Production line monitoring

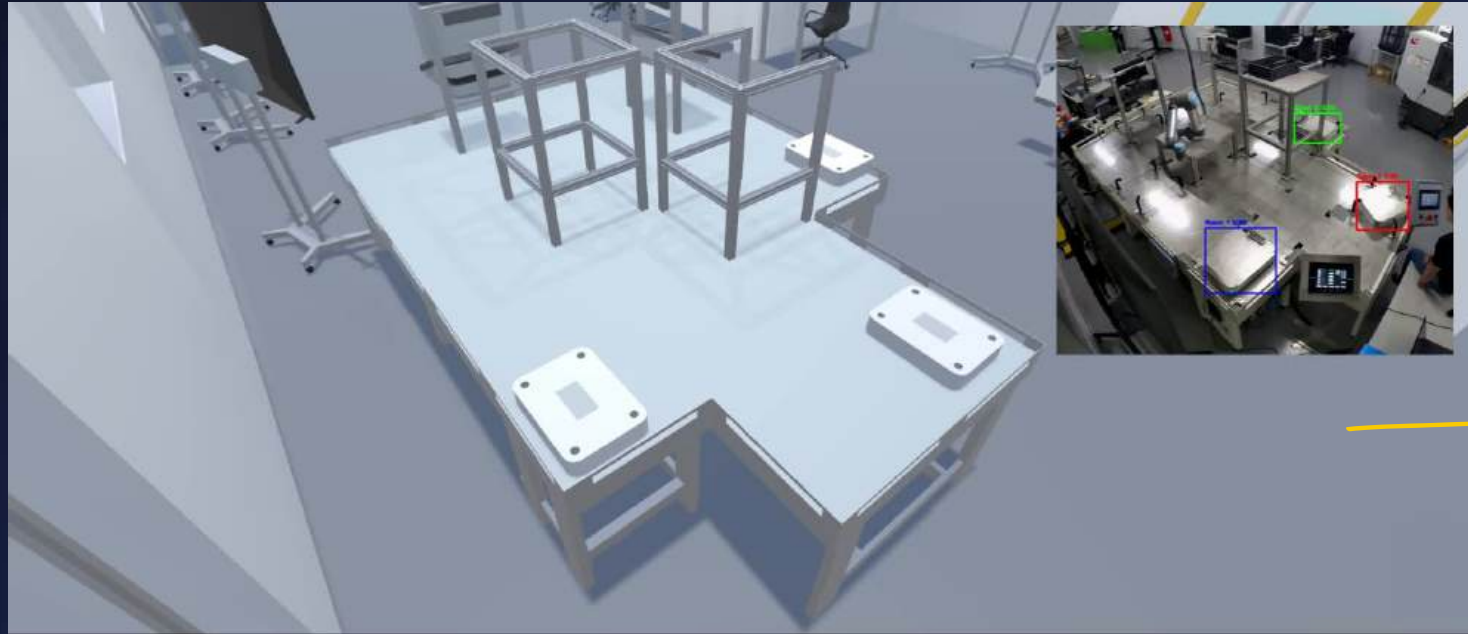
Yield and throughput optimization

Process simulation before changes

Quality deviation detection



Asset health & maintenance prediction



### Production line monitoring

Real-time digital twin of the production line, synchronizing machines, operators, and workflows to monitor throughput, detect bottlenecks, and optimize operations continuously.



### Quality deviation detection

Computer vision and virtual sensors identify quality deviations in real-time, reducing manual inspections, rework, and scrap while ensuring consistent product quality.

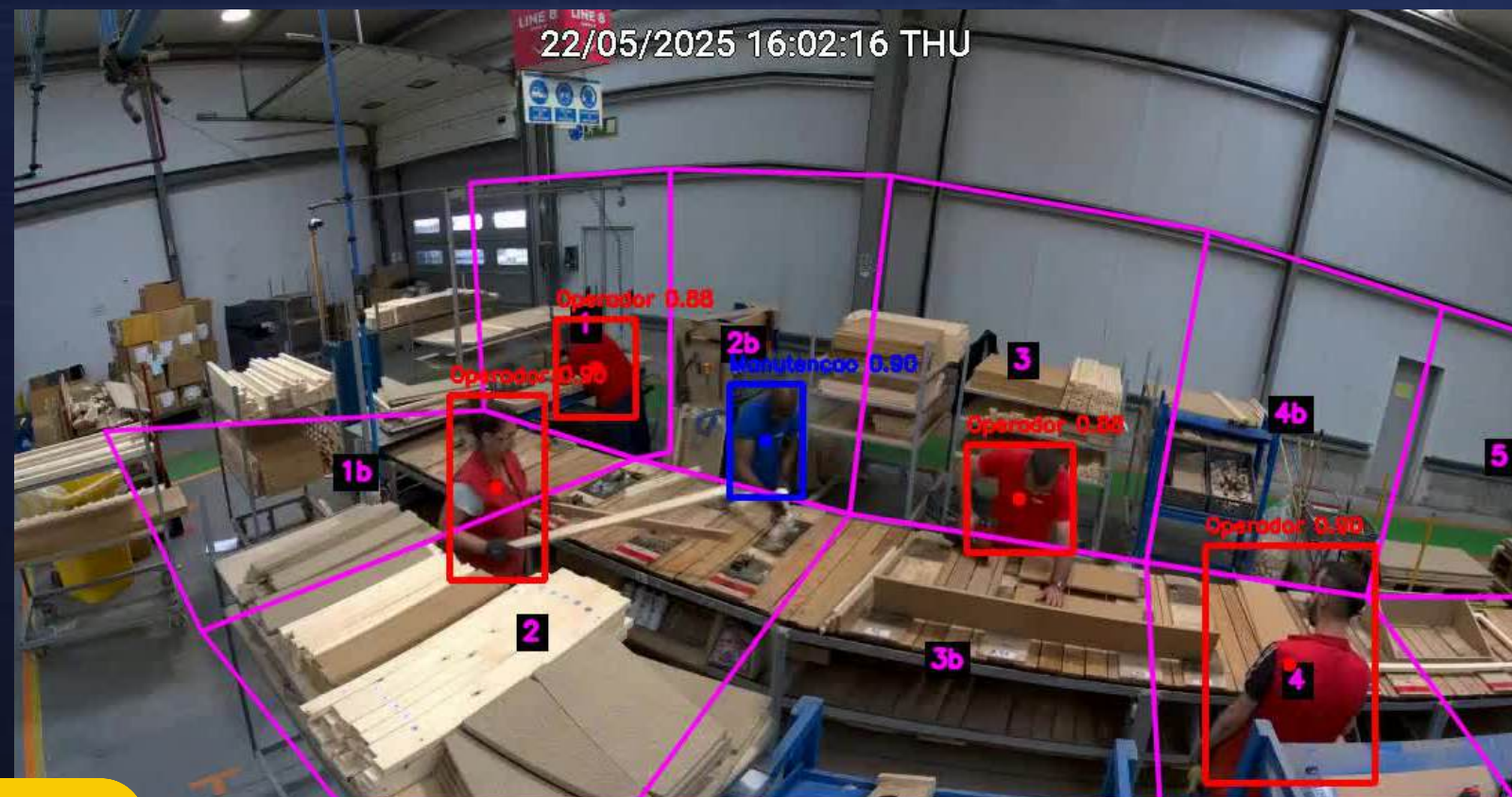


**Problem:** Operators induce variability in a production process that causes loss of efficiency and quality

**Our Solution:**

Virtual sensor task traceability in real-time using computer vision for precise remote monitoring by automatically logging every action in a traceable format

**— 90% in quality problems**



Manual task tracking



**Problem:** The line produces different types of products, and this variability precludes using traditional AI approaches to calculate the remaining lifetime of components.

### Our Solution:

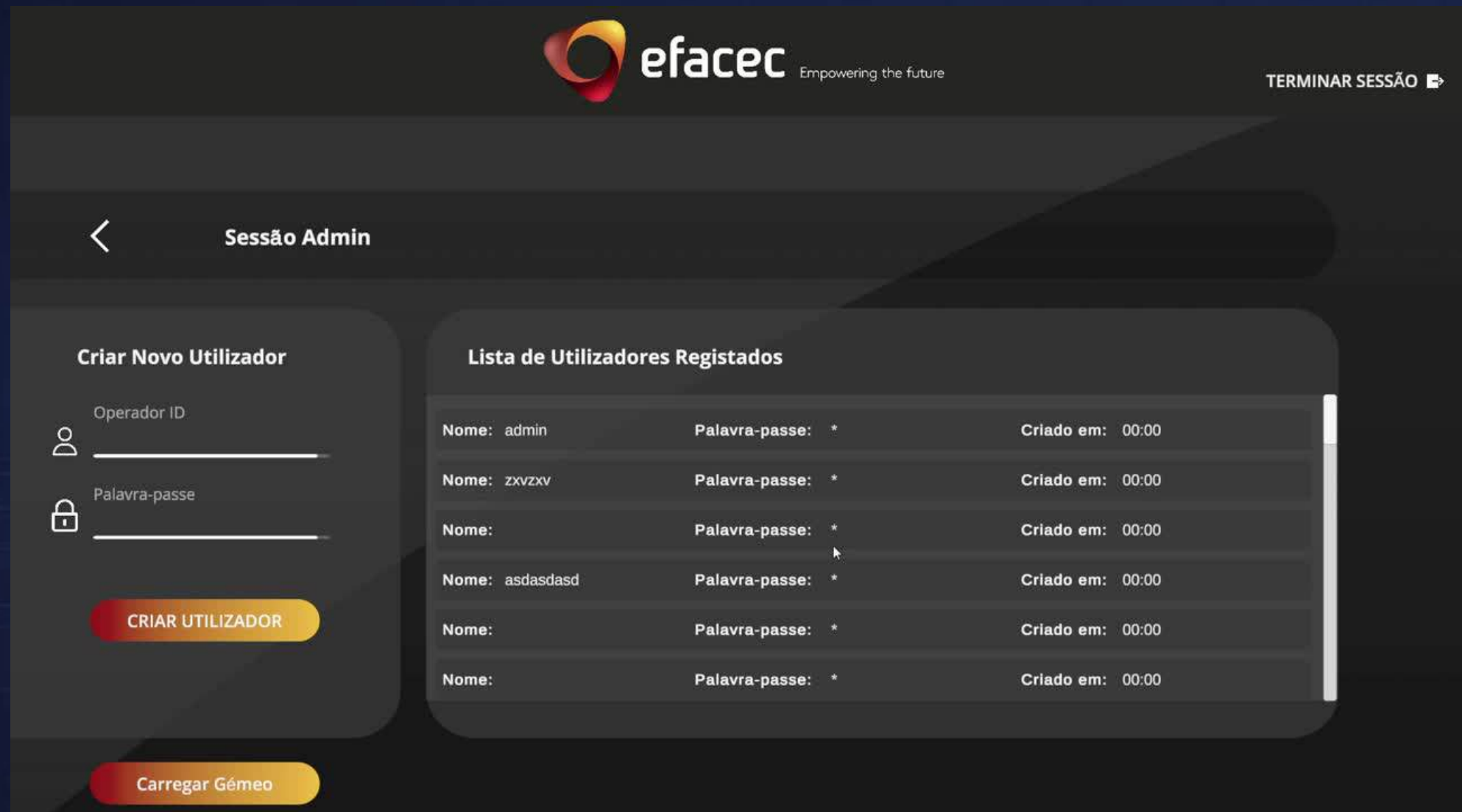
Virtual sensors are based in physics calculations and can calculate component stresses for any kind of movement, ensuring **precise prediction of remaining lifetime**

**— 80% components replaced per year**



# The real impact

Digital twins are not only 'nice visuals'. They pay the bills.



*Before*

*Now*

manual machine programming



Automatic programming

setup time 10min



setup time 1min

operators recorded quality parameters on paper and a line leader checked results manually



parameters are recorded digitally and verified automatically. No delay or mistakes

37 units per week



48 units per week

**+** 30% productivity improvement

**+** €160 saved per unit

**+** €320k yearly in cost reduction

# ENERGY & CRITICAL INFRASTRUCTURE

## *Resilience, Reliability & Efficiency*

Asset-intensive operations

Predictive maintenance of plants & networks



Risk reduction & resilience

Performance optimization

Sustainability tracking



Discrete Event Simulation (DES)

Digital Twins powered by Discrete Event Simulation (DES) enable organizations to **model, test and optimize complex industrial systems** before executing changes in the real world.

Allows teams to:

- Simulate production, logistics and infrastructure flows
- Evaluate different scenarios and capacity configurations
- Identify bottlenecks, inefficiencies and operational risks
- Predict performance under real operating constraints



By combining **real-time data** with **simulation**, organizations gain operational intelligence that supports **better planning, safer decisions and more efficient industrial operations.**

# Petroleum, Gas & Mining Industry

Calculate variables that are hard, expensive, or impossible to measure directly.



A 3D industrial asset (equipment/process) with internal variables visualized

Virtual sensors compute values such as:

Temperature/Flow/Pressure/Velocity/Process efficiency

Data is generated by simulation models (CFD / physics) and aligned with operational data  
The system updates continuously, behaving like a live digital replica of the real asset

BACK

Physics-based Digital Twin to model **flow, accumulation and transport inside pipelines**

A combination of simulation + operational data to understand how the system really behaves

Virtual sensors to estimate **flow, pressure, and bottlenecks without adding hardware**

## Business value:

Early **detection of blockages, inefficiencies, and abnormal behavior**

Safer operation in high-risk environments (oil, gas, and mining)

**Better planning of maintenance and operational changes before applying them in reality**

# Defense & Dual-Use Applications

*Higher Requirements, Same Core Technology*

Training & simulation in risk-free environments

Secure, explainable, physics-based models

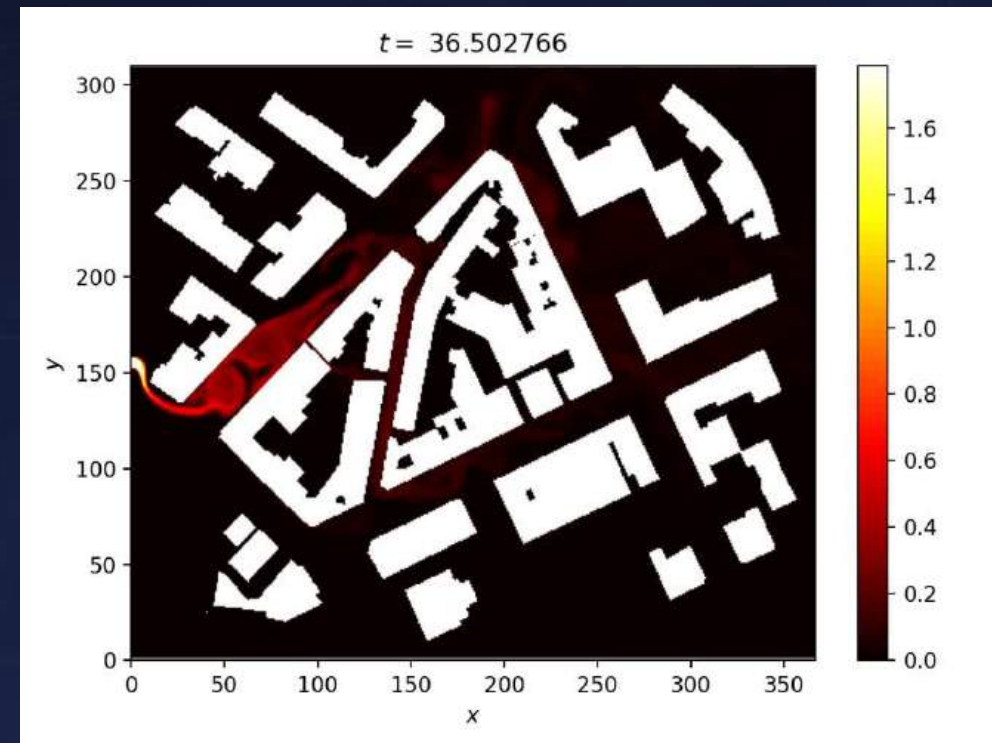
Asset readiness & lifecycle management

Secure, explainable, physics-based models

Operation in sensor-limited contexts

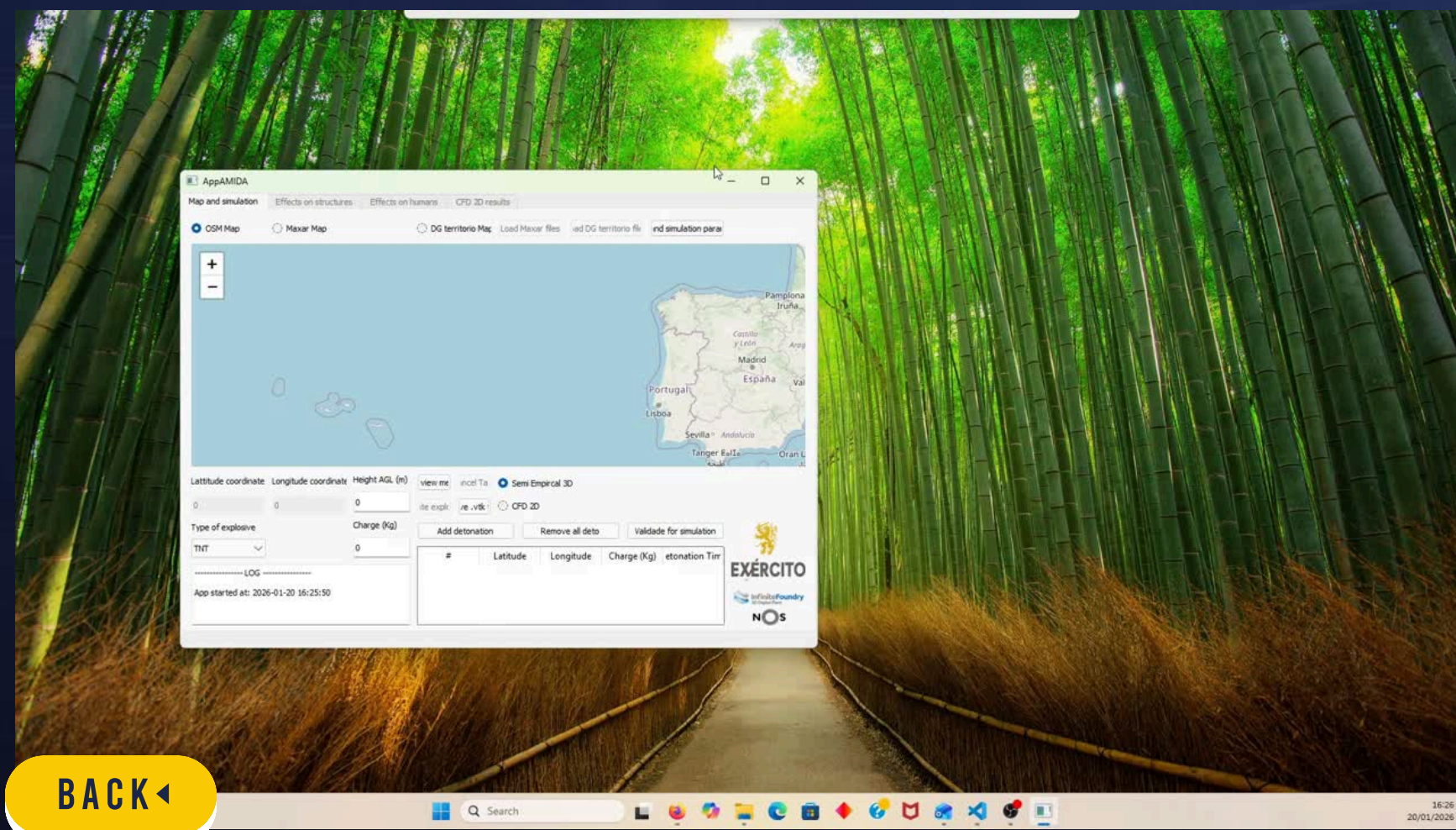
Critical infrastructure protection



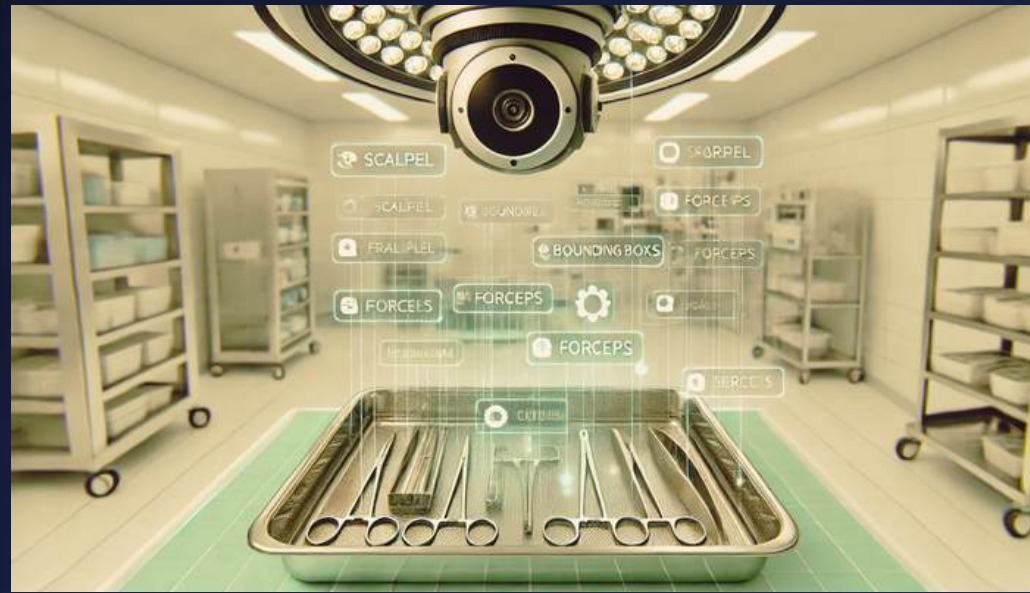


These videos show **physics-based Digital Twin simulations** applied to **high-risk environments**, including **explosion effects and gas dispersion**.

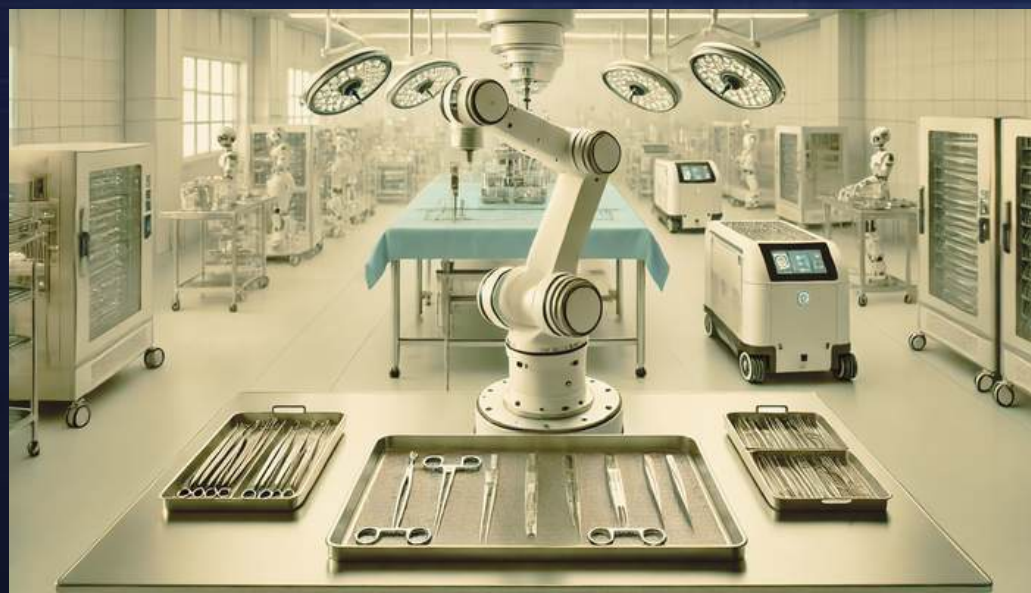
- Simulate blast pressure propagation and dispersion patterns
- Assess impact across complex urban or industrial environments
- Evaluate different scenarios and mitigation strategies
- Support planning, preparedness, and risk reduction decisions



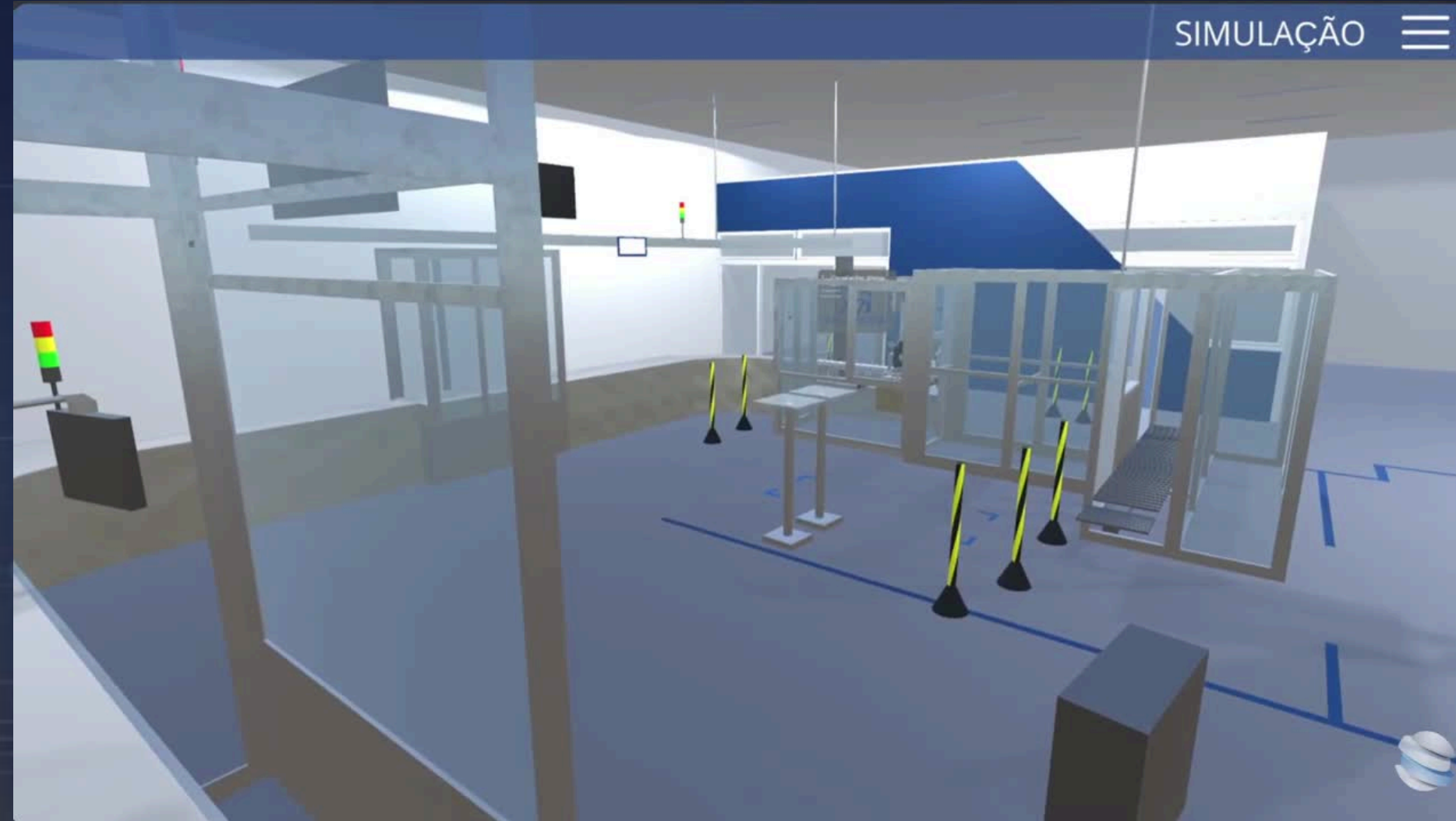
By combining **real-time data, physics-based models and simulation**, Digital Twins provide **decision support for defense and civil protection scenarios** – **without exposing people or assets to real-world risk**.



AI System to Identify Medical Instruments in surgical kit assembly



Digitalization of health centers for optimization and efficiency



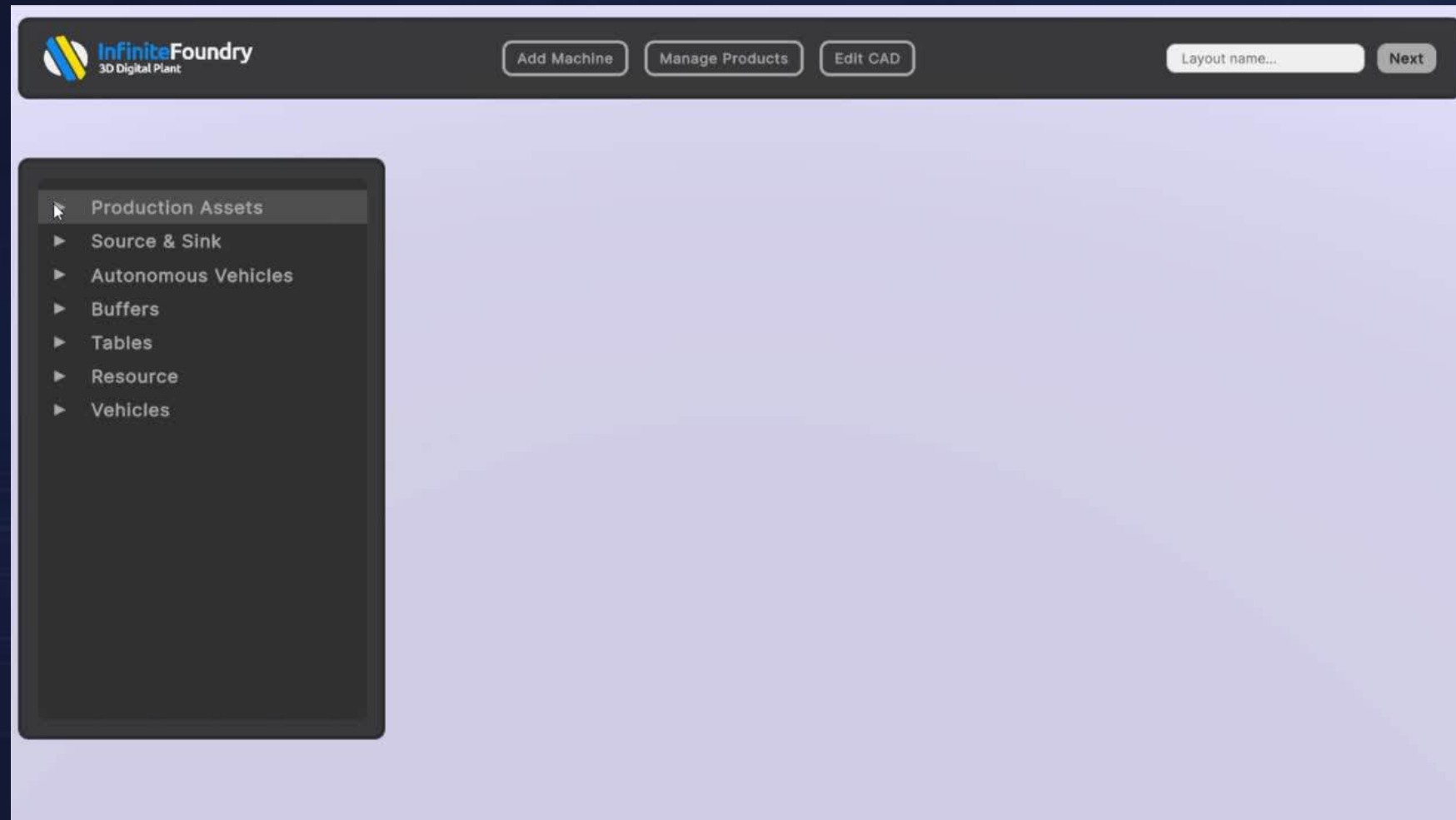
- Real-time monitoring of production and equipment behavior
- Simulation of process parameters (pressure, force, geometry, materials)
- Virtual testing of changes before physical deployment
- Improved quality, traceability, and operational efficiency

By applying Digital Twin technology to **healthcare manufacturing**, organizations can ensure process **stability, regulatory compliance**, and **predictable performance** in highly constrained environments.

[WATCH VIDEO](#)



We transform **consumer wishes** directly into **real-time intelligent production**.



- Connects consumer AI platforms directly to industrial execution
- Converts consumer intent into automatic production orders
- Orchestrates global networks of decentralized micro-factories
- Creates a unified intelligence layer across the entire supply chain

Integrates:

**Consumer Intelligence - Operational Intelligence - Manufacturing Execution**

### 1. Consumer-Driven Customisation

- Mass customisation at an industrial scale
- Each product tailored to individual preferences
- Maintains cost efficiency of mass production

### 2. Localised On-Demand Manufacturing

- Dynamic routing to the nearest micro-factory
- Reduced logistics costs and carbon footprint
- Immediate response to demand

### 3. Continuous AI Optimisation

- Real-time AI-driven adjustments
- Continuous optimisation of:
  - quality - efficiency - capacity
- Adaptive and autonomous system

### 4. Micro-Factory Network

- Distributed network of intelligent suppliers
- Shift from passive suppliers → innovation hubs
- Global scalability with local execution

Decentralized, intelligent, consumer-driven production – in real time



**InfiniteFoundry**  
3D Digital Plant

# OTHER

# FEATURES

BACK ◀





We capture real industrial environments using **laser scanning** and existing CAD data, transforming them into **accurate, simulation-ready 3D models**.

Our process ensures:

- High geometric accuracy of existing assets
- Fast conversion from scan to operational model
- A reliable digital foundation for simulation, optimization and AI

This is the first step to ensure that all **simulations, predictions and decisions are based on reality**.

# Remote Control & Remote Operations

Operate, monitor, and optimize industrial systems anywhere, anytime.

## What we enable:

- Remote monitoring and control of industrial assets through the Digital Twin
- Real-time connection between physical equipment, PLCs and the virtual environment
- Safe operation of complex or hazardous processes without physical presence

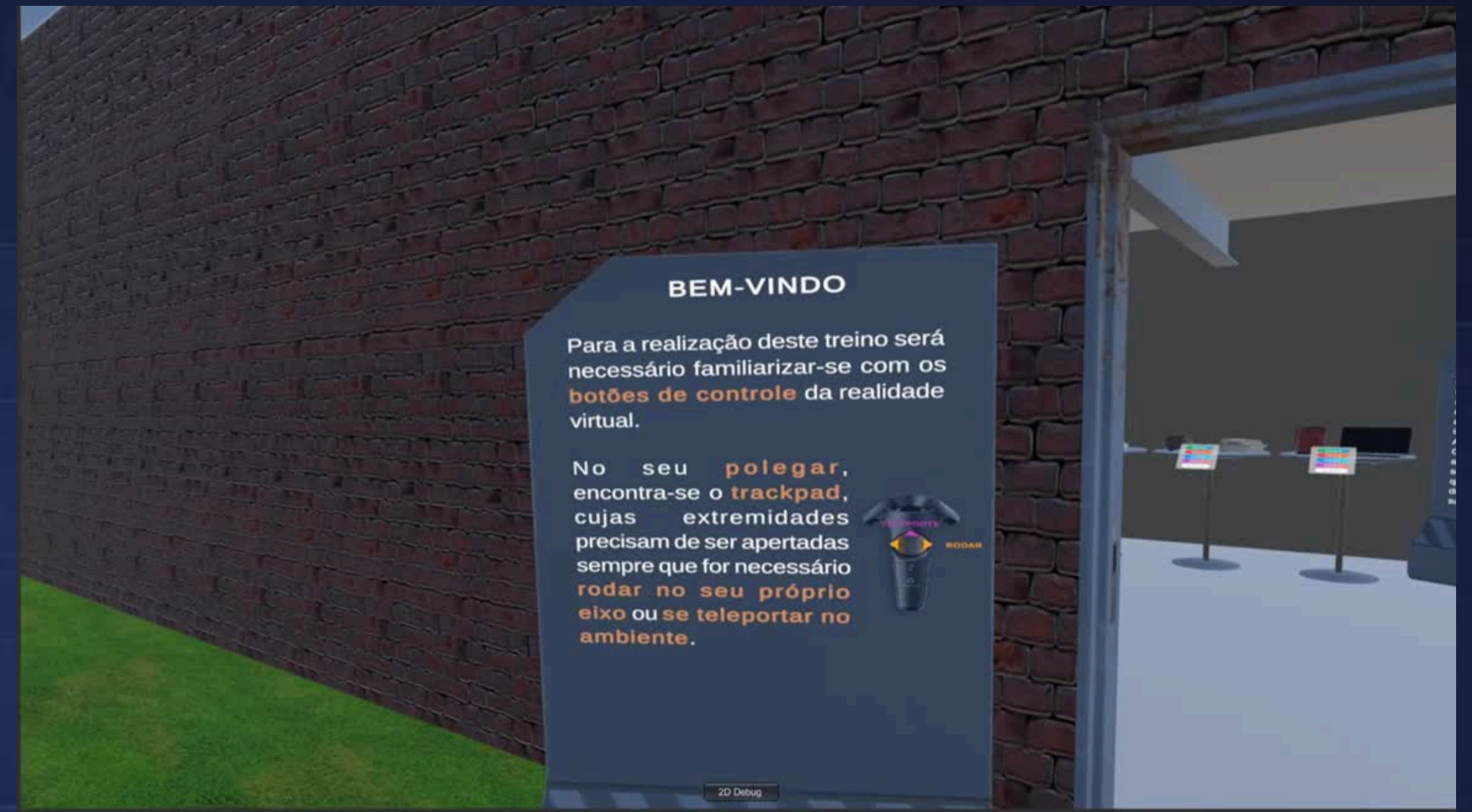
## Business value:

- Reduce downtime by acting faster and remotely
- Increase safety by minimizing human exposure to risk
- Lower operational costs (less travel, fewer on-site interventions)
- Enable remote experts to support multiple plants simultaneously





*(Operational and technical training)*



*(Safety and emergency response training)*

Using Digital Twins and physics-based simulation, we **recreate real industrial and safety scenarios to accelerate learning, reduce human error and improve operational readiness – without stopping production.**

- Faster onboarding and reskilling of operators
- Standardized procedures across teams and locations
- Hands-on training based on real operational scenarios
- Safety and emergency response training without physical risk

WATCH VIDEO

Usuário

Avaliação

Nome Cristiano

Sexo Masculino

Idade

Altura Enter text

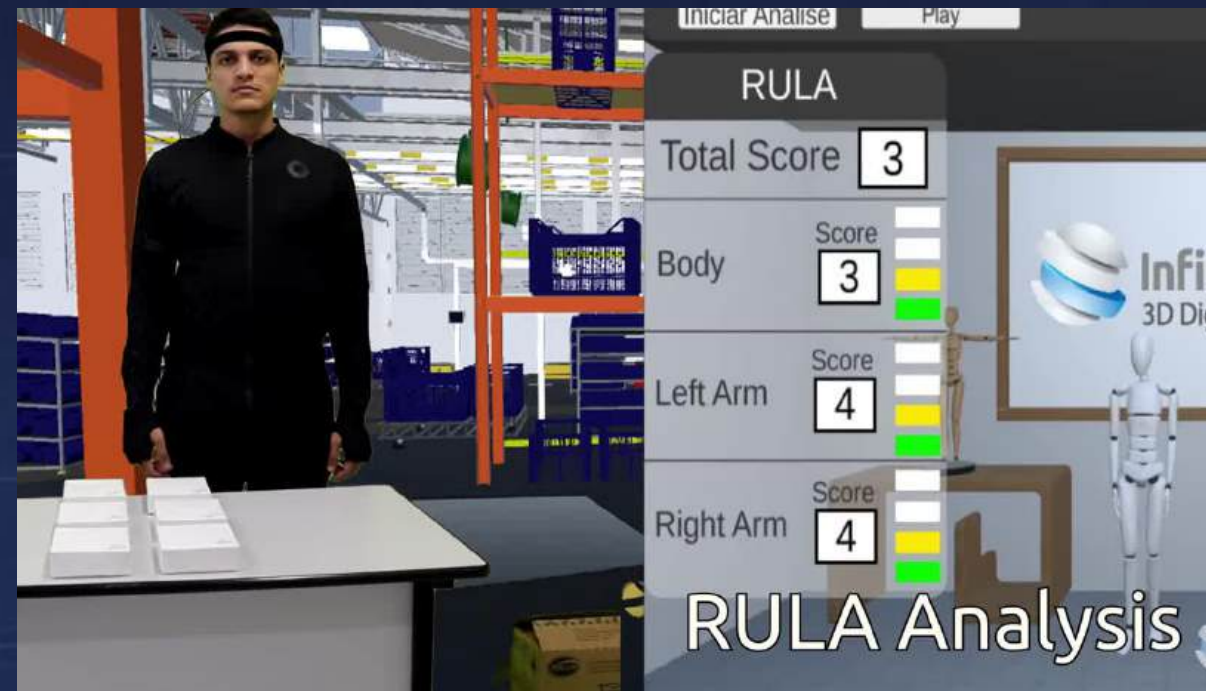
Esforço

Tempo

Avaliações

RULA  OWAS  NIOS

Iniciar



### What we can do:

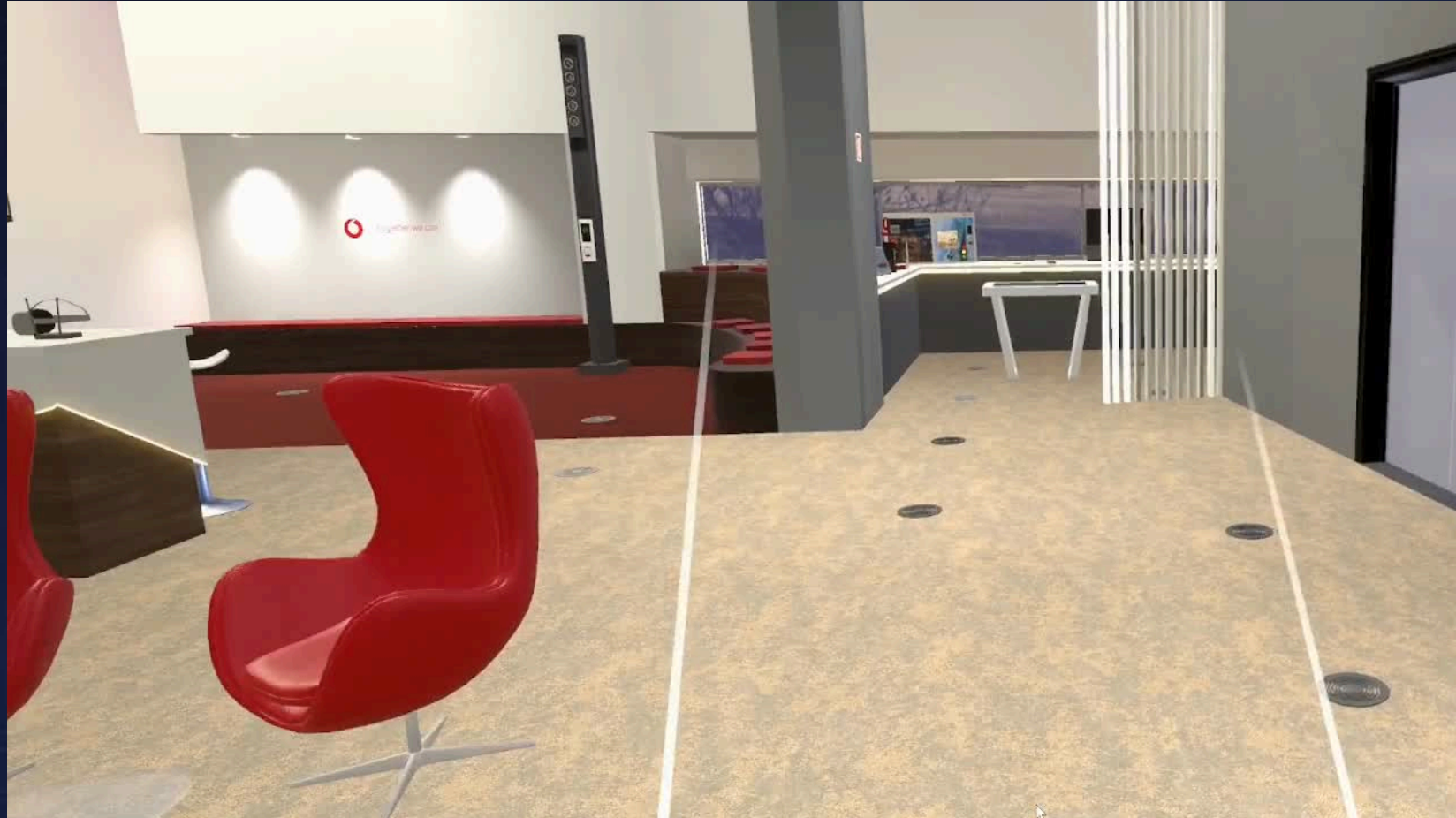
- Identify ergonomic risks **before** injuries happen
- **Reduce** fatigue, errors, and rework
- **Improve** workstation design and task sequencing
- **Accelerate training** and **adaptation** to new processes



### Real impact:

- **Fewer work-related injuries** and **absenteeism**
- **Higher productivity** and **operator comfort**
- **Better compliance** with **safety and ergonomics standards**
- **Data-driven decisions** instead of trial and error

BACK



*(showroom / configurable environment)*

Real-time interaction with lighting, scale, objects and layout.  
Immediate visual and spatial feedback.

### Value:

Ideal for design validation, stakeholder demos and early decision-making.

Replace static drawings with experiential understanding.



*(digital twin of a retail environment)*

Full digital replica of a supermarket layout.  
Shelves, products, circulation and customer visibility.

### Value:

Test store layouts, customer flow and merchandising strategies.

Support rollout of new concepts without disrupting operations.

Bridge retail, logistics and operations in a single digital model.

# **Typical Pilot** → **What is required**

**Duration:** 6–10 weeks

**Data:** existing PLC / SCADA

0 to minimal sensors required

**Client team:** 1–2 people

**Output:** operational model + KPIs



**From Pilot** → **To scale**

**Measurable KPI's & fast time-value**

**Use existing data & systems**

**Start with a focused pilot**

**Implementation Approach**

**Let's Talk !**

*In 6–8 weeks, you will have a closed-loop operational model  
controlling one critical bottleneck*

**Let's schedule a meeting !**

**André Luz**

*General Manager*

**Bruna Bento**

*Operations & International Projects Manager*

**Maria Ribeiro**

*Sales & Customer Success Manager*

**BACK** ◀



**InfiniteFoundry**  
3D Digital Plant

**THANK YOU !**

[infinitefoundry.com](http://infinitefoundry.com)

