vntecc

CASEBOOK

hey there
we are vintecc

… and we are passioned about technology. We believe technology is a major game-changer in tackling tomorrow's challenges towards a smarter, more connected and more sustainable future. Our mission is to accelerate your industry in this digital journey.

This casebook is here to inspire you.
It showcases real-world examples from each of our solution domains and how our technology is contributing to create a difference that counts.

Please take a moment to review and to reflect. On what digital acceleration could mean for your industry. On how it can contribute to your growth and success. Transformation is happening now.

Feel free to reach out to our skilled, hands-on and innovation-driven team. We look forward to engage and to discuss your challenges and questions of tomorrow.

Most of all, let's collaborate and innovate together!

Sincerely yours,

The Vintecc team

www.vintecc.com

our
vision

smart

Everything what we do at Vintecc - and the daily drive our team has for our clients' projects - is summarized in that one single word. Smart.
The term 'smart' describes the vision of Vintecc to synchronize people, machines, assets, systems, processes, data … etc. to work together in the best possible way, and to find the best answer to your challenges of tomorrow.

Accelerating your industry. Smart.

Co-creation with our clients is at the center of our DNA. Combining your domain expertise with our cross-functional industrial knowledge can create technological firework.
This approach and joint endeavor allows us to build the best performing custom software or
AI-driven solution that works for you.

Accelerating your industry. Collaborative.

collaborative

hands-on

We don't sit. We are hands on. We stand next to you from concept ideation to realisation and follow up.
We like doing things and become closely involved in managing and organizing a solution for your industrial challenge of tomorrow. We make sure you'll be able to take objective decisions and move forward.

We relate. We understand. We solve. You accelerate.

discover
our solutions

Computer Vision
Understanding objects and images

Digital Twins
Simulate, validate & analyze in advance

Autonomous Systems
Shift from automation to autonomy

Industrial Iot & Data Analytics
Your industrial data is gold

ACCELERATE WITH OUR TECH-STACK

Capture
Capture accelerates your IoT journey towards full data connectivity.

Dual
Dual, our digital twin platform, offers you simulation-as-a-service, fit for purpose.

Interact
Interact makes the development of human machine interfaces (HMI) fast and easy.

we accelerate your industry
with **computer vision**
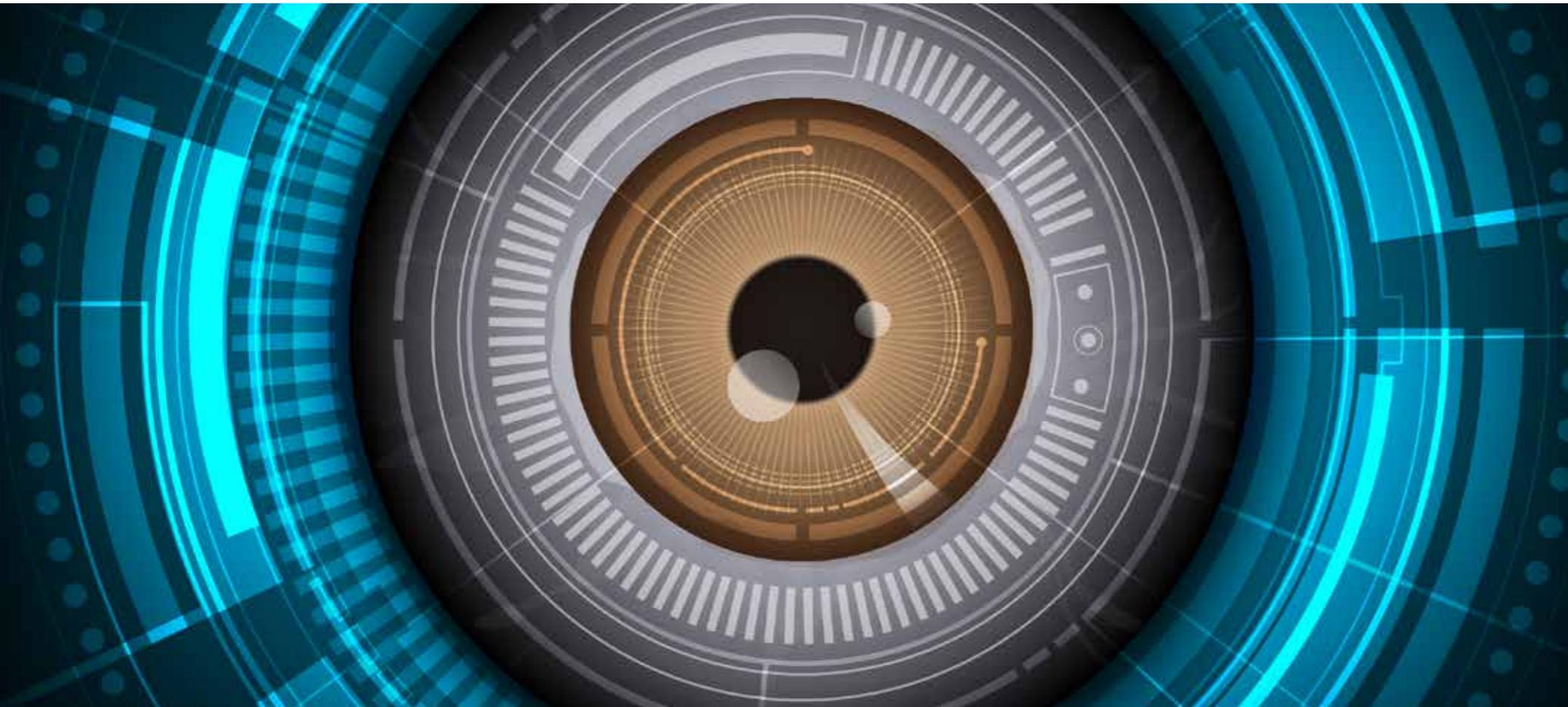
product recognition

product selection

product inspection

synthetic data

quality control

production metrics

object location & tracking

volume scanning & measurement

Product inspection & selection

Combining the power of computer vision & synthetic data

⬖ CHALLENGE

Select the best potato for the best suited potato product.

💡 SOLUTIONS

Ca	Du	Ia
Capture	Dual	Interact

◎ RESULT

- Use of synthetic data speeds up the algorithm development
- Algorithm development before use
- Faster iterations of AI-model
- Control over dataset
- Overall improved & faster commissioning

START

Grab texture of a real potato

Render synthetic texture

Generate synthetic potato

Randomize synthetic potatoes

DEPLOY

Deploy on real setup

Train and improve AI-model

Perform automatic labeling

Generate dataset

EXTERNAL LINKS

Loading machine at work

Labelled potato's

Randomization synthetic potato's

Product recognition & adjusting

Identifying stone fractions and their size using synthetic data

⬦ CHALLENGE

Objective measurement of stone fractions for automatic adjustment.

💡 SOLUTIONS

👁	🤖	🧠	🔗

Ca	Du	Ia
Capture	Dual	Interact

◎ RESULT

- Fast iterations without labour intensive labelling
- More control of training set
- Algorithm development before deployment
- Objective data for control input

START

Real image

Synthetic data generation

Improved training

AI-model selection and training

Instance segmentation

DEPLOY
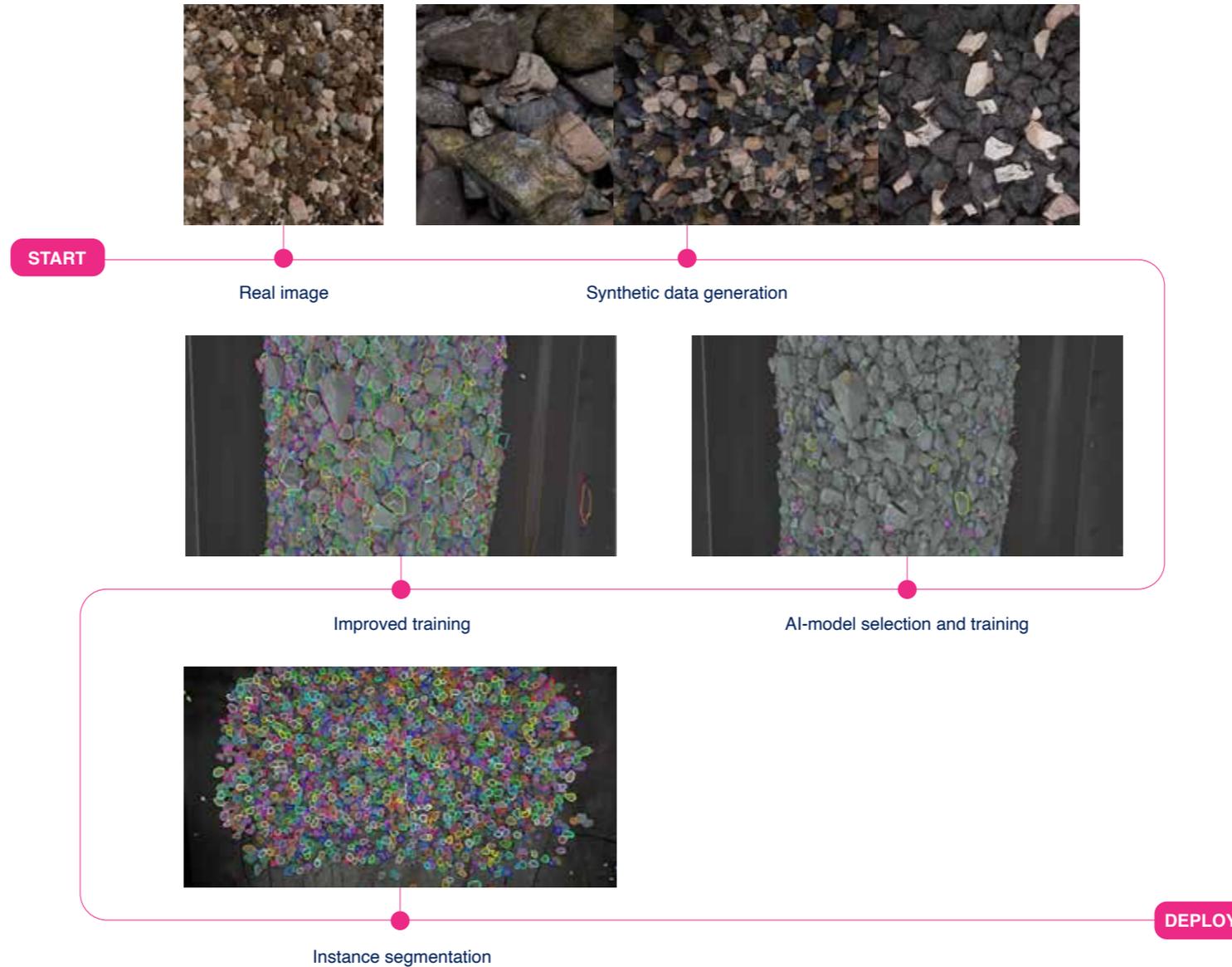
EXTERNAL LINKS

Simulation debris

Volume scanning & measuring

Shifting from 1 daily manual check to continuous realtime measurement

⬦ CHALLENGE

Switch from periodic checks to realtime measurement of all potato stock bunkers.

💡 SOLUTIONS

Ca Capture   Du Dual   Ia Interact

◎ RESULT

- Simulation to select type and number of Lidar sensors
- Realtime measurements of available volume of potatoes in the bunker
- Avoid production downtime
- Well-informed bunker selection for production
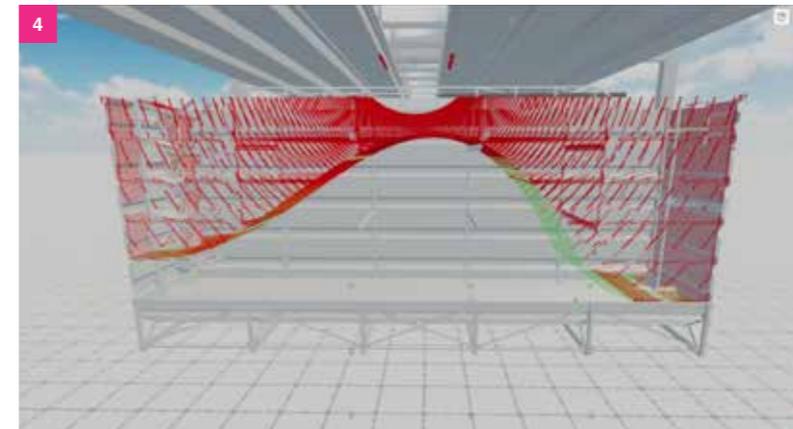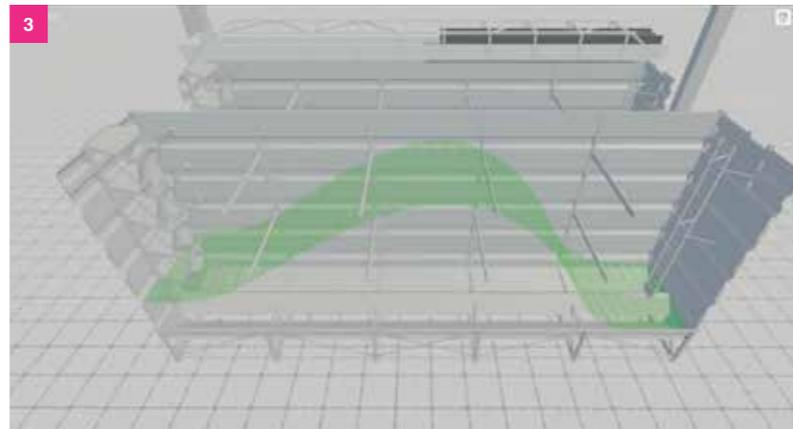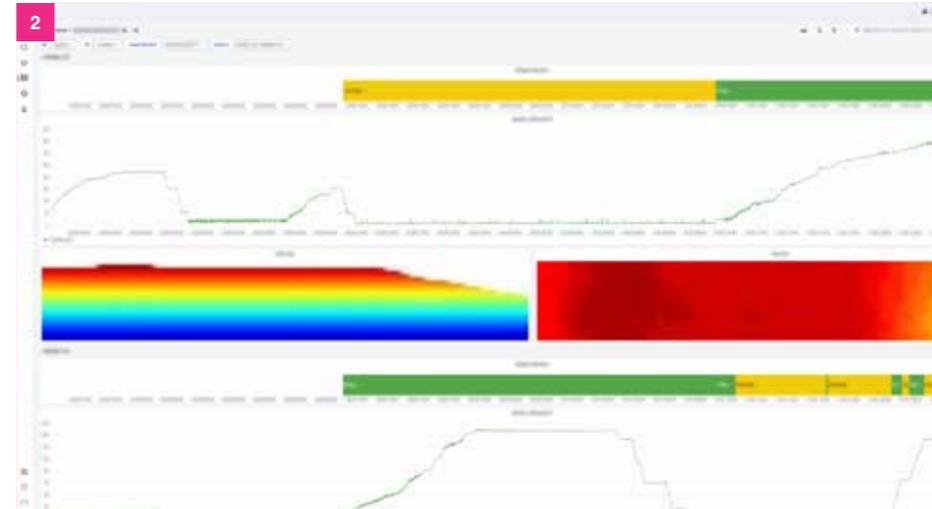
IMAGES

1. Real potato bunker
2. Image ingest in Capture to display and monitor results
3. Understanding filling flow using DUAL simulation
4. LIDAR simulation

EXTERNAL LINKS

▶ Simulation bunker filling

▶ Realtime bunker filling

Combining the power of computer vision & synthetic data

Mapping & predicting the ideal fishing grounds

◈ CHALLENGE

Automatically collect the biological data of caught fish on fishing vessels so a better fish policy can be applied by the government.

💡 SOLUTIONS

Ca	Du	Ia
Capture	Dual	Interact

◎ RESULT

- Computer Vision technology speeds up the data collection on vessels
- Synthetic data was used to accelerate the training of the AI-models
- AI driven image processing means that fishing quotas can be determined more extensively
- Better stock assessment and catch prediction
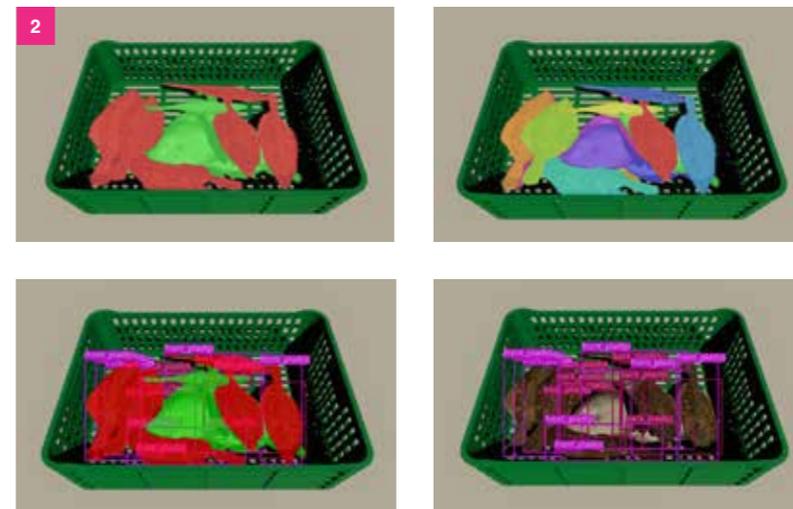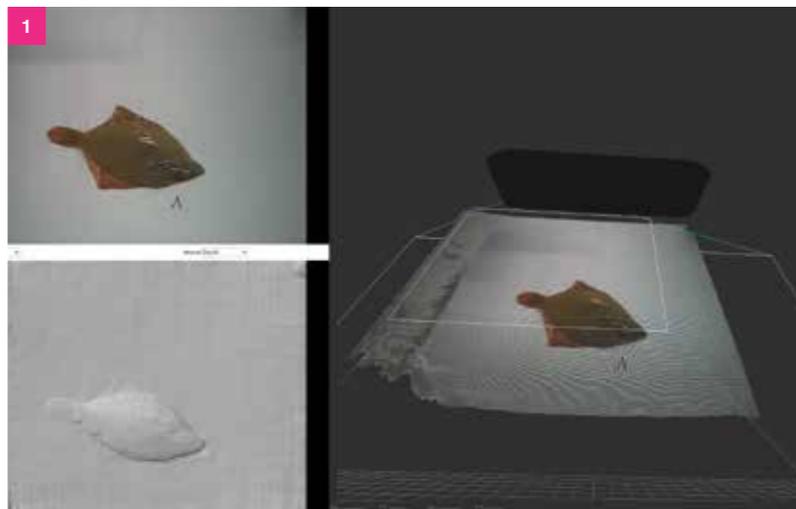
IMAGES

1. 3D&RGB scanning of the fish
2. Training the AI-model using synthetic data

EXTERNAL LINKS

DE TIJD

Virtuele vissen maken om echte vissen te herkennen

vrt nws

Virtuele vissen en AI moeten ons vertellen hoe het bij ons onder water gesteld is

Product inspection

Inspection of concrete slabs

⬥ CHALLENGE

Visual inspection of iron reinforcement net in a concrete mold. Supervise and assist operator handling.

💡 SOLUTIONS

👁		🧠	🔀
Ca Capture	**Du** Dual	**Ia** Interact	

◎ RESULT

- Industrial IoT platform Capture
- Synergy project between Computer Vision and Capture
- Image ingest in Capture
- Tracing and proving quality
- Visual insights into the production numbers
- Increased quality assurance
- Periodic reporting and alerting
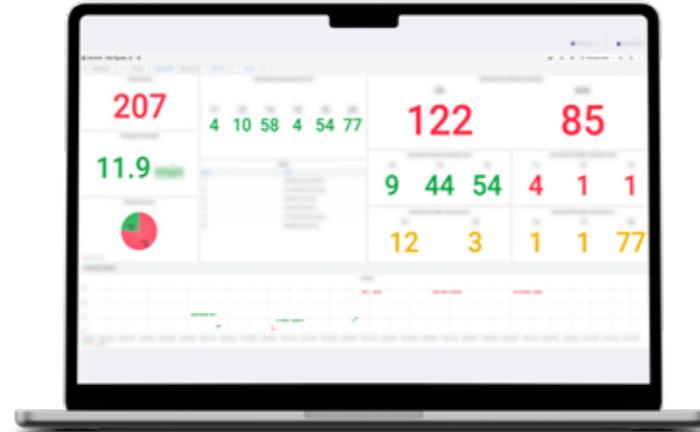
IMAGES

1. Visual dashboard to check production status
2. Image ingestion in Capture along with time series data for evaluation and retraining
3. Visual inspection of presence of reinforcing net
4. Cattle slats
5. Potato slats

Quality control of cookies

High precision 3D imaging and inspection of every cookie

◈ CHALLENGE

Build a visual quality inspection system that could filter out imperfect cookies at high speed.

💡 SOLUTIONS

Ca Capture

Du Dual

Ia Interact

◎ RESULT

- High speed product inspection
- Increased quality assurance
- Realtime insights
- Daily reporting & alerting
- Control based on objective parameters
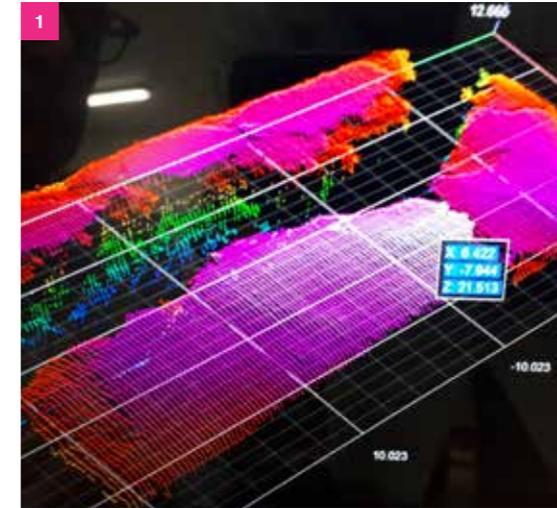
IMAGES

1. Detecting 'cracks' on the cookie
2. Quality inspection set-up at high speed
3. Reporting & alerting dashboard using Capture

EXTERNAL LINKS

High speed inspection

we accelerate your industry
with **digital twins**
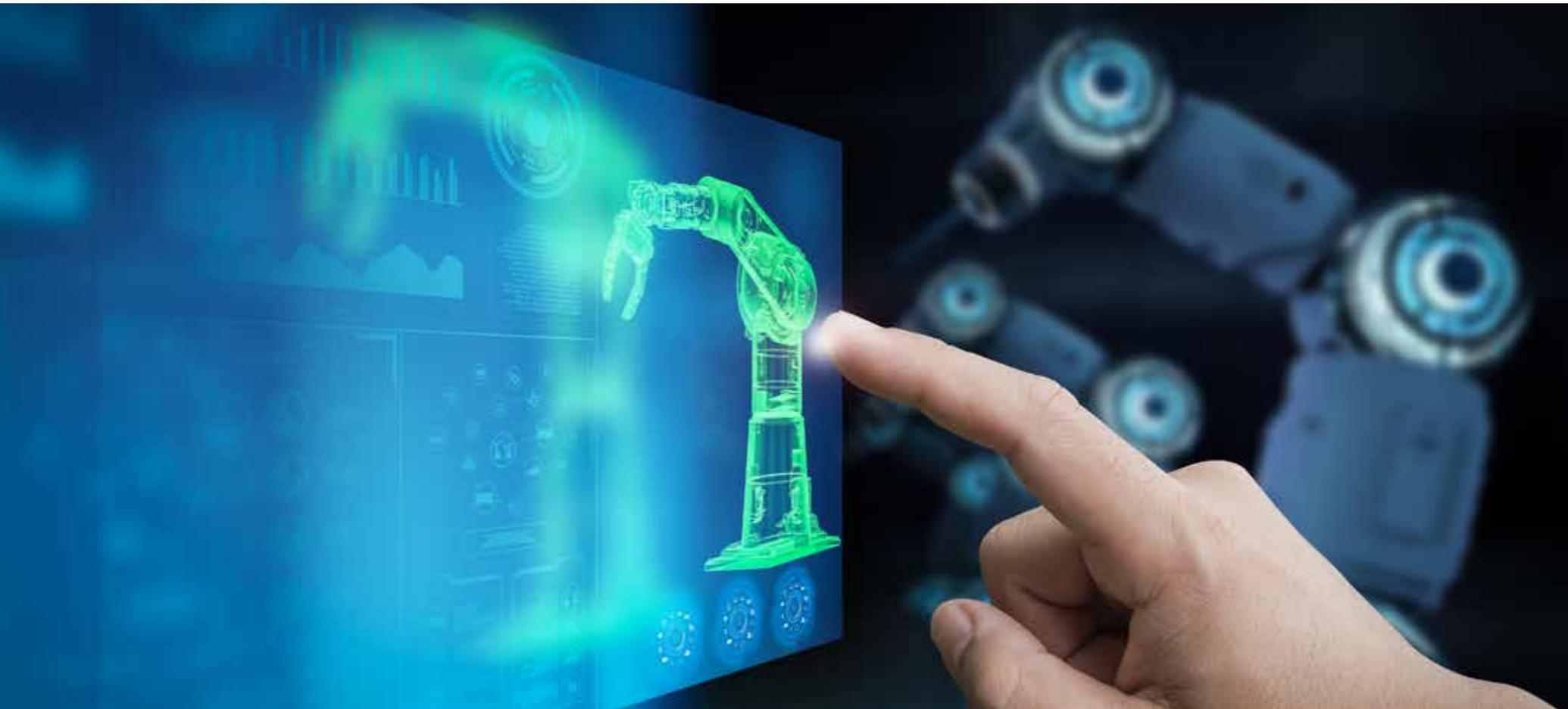
simulation

virtual optimization

virtual validation

virtual commissioning

virtual prototyping

training

throughput analysis

automated testing

Simulation & virtual commissioning

Automating a human task of a forage harvester driver

⬙ CHALLENGE

Automated spout control for automatic trailer filling.

💡 SOLUTIONS

Ca	Du	Ia
Capture	Dual	Interact

◎ RESULT

- Prototyping & testing the software before use
- Faster iterations of the algorithm
- Speed-up development time
- Less time on bug fixing
- Peace of mind when adding new features thanks to virtual validation

IMAGES

1. Real machine
2. Automatically controlling the spout while driving
3. Simulating the ideal camera position on the spout
4. Adding visual disturbances virtually

EXTERNAL LINKS

Configuring the settings
Adding distortion
Optimal filling

Optimal filling

Real result

Virtual optimisation and decision making

Digital terminal simulator

◈ CHALLENGE

Help us with distance optimisation and CO_2 emission reduction for terminal operations as part of our global sustainability strategy.

💡 SOLUTIONS

Ca
Capture

Du
Dual

Ia
Interact

◎ RESULT

- Reduce energy waste
- Reduce CO2 footprint
- Simulate new traffic concepts
- Deliver stand-alone simulation tool
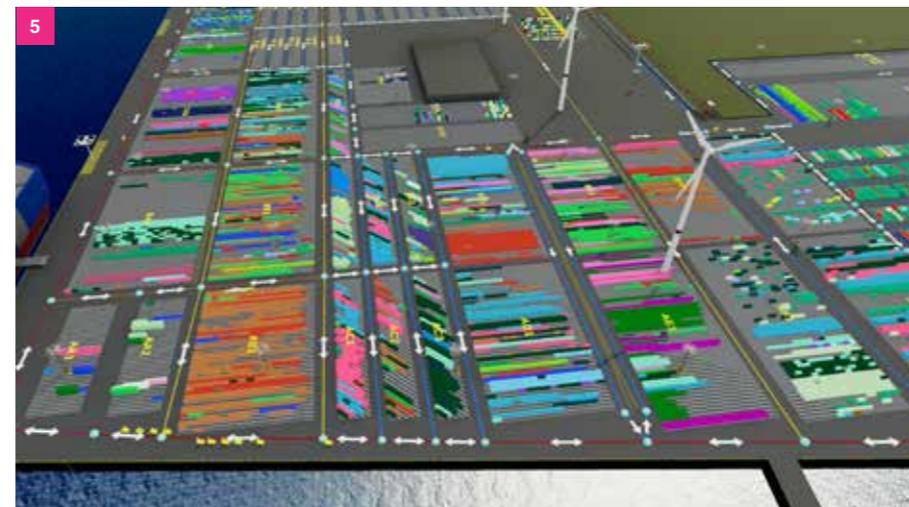
IMAGES

1. Scale and view of the complete terminal
2. Disembarking the cars from the vessel
3. Distance optimization to reduce CO_2 emissions
4. Editor mode of the Digital Twin
5. Full throughput simulations.

EXTERNAL LINKS

Client casemovie

Simulation of the traffic concepts

Terminal editor

Virtual commissioning

Simulating natural sea waves on a unique vessel designed to dump gravel for underwater gravel bed

⬦ CHALLENGE

Simulating natural sea waves on a unique vessel designed to dump gravel as a foundation - for underwater tunnel segments - for the longest submerged tunnel in the world: the Fehmarnbelt Tunnel.

💡 SOLUTIONS

Ca
Capture

Du
Dual

Ia
Interact

◎ RESULT

- Better simulation of dynamics of boat and frame in various sea scenarios
- PLC code validation
- Faster debugging
- Overcoming complexity of enormous amount of physical variables
- Testing variable scenarios

Fehmarnbelt tunnel
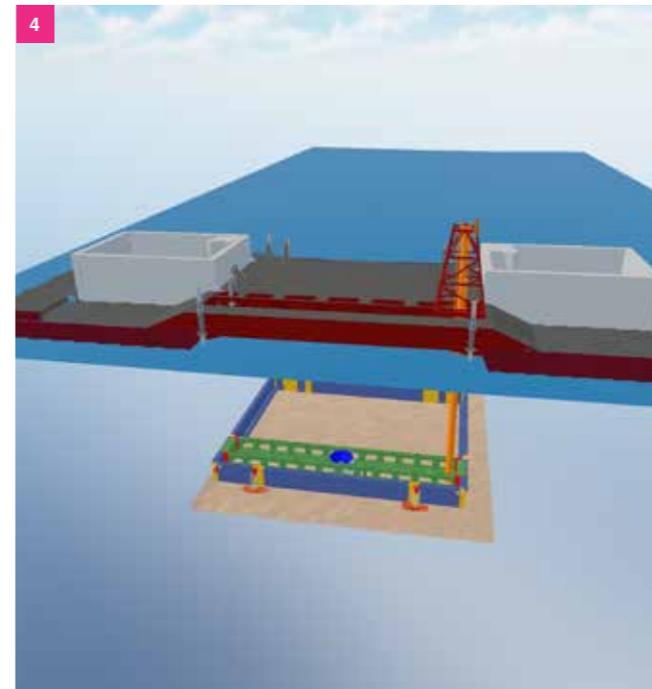
IMAGES

1. 18km tunnel between Fehmarn (D) and Lolland (DK)
2. Transported tunnel segment put in place
3. The unique vessel construction
4. Natural waves simulation on vessel

EXTERNAL LINKS

Vessel casemovie

Vessel simulation

Building the tunnel

Virtual optimization & validation

Objectively determine expected returns from an investment

⬧ CHALLENGE

Simulate and define if a planned and large hardware investment will improve and optimize the packaging process. Or not.

💡 SOLUTIONS

| Ca	Du	Ia
Capture	Dual	Interact

◎ RESULT

- Defining critical recommendations
- Redirected investment based on the outcomes of these simulations Management took informed decisions
- Informed decisions for management
- Improved traffic control and handling increased capacity by by double-digit numbers
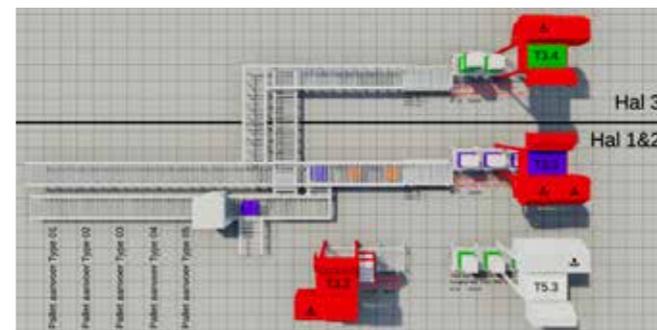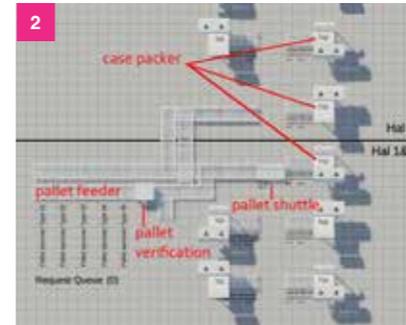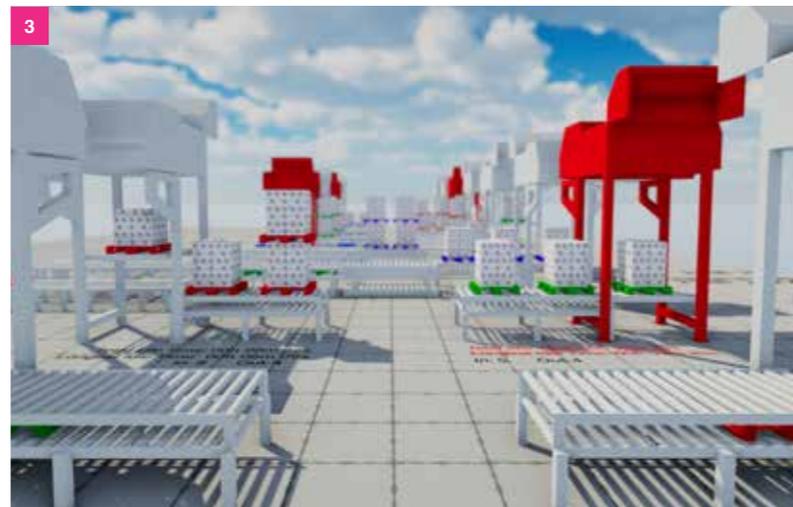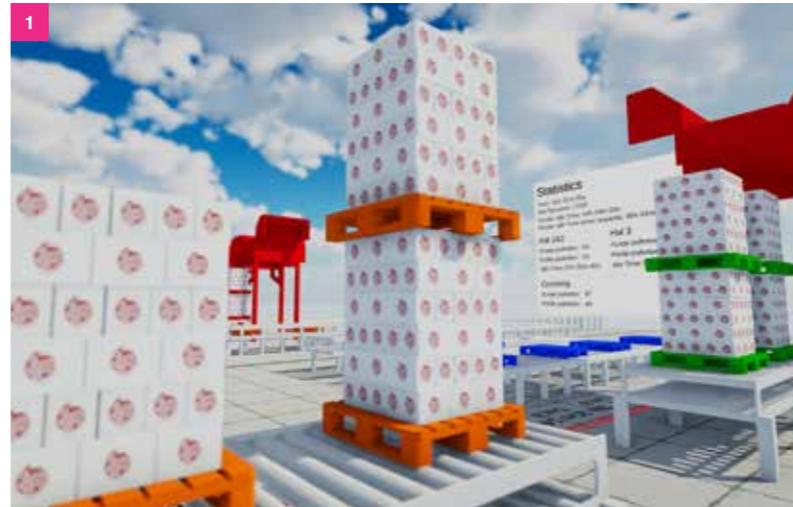
IMAGES

1. CAD-models can be imported fast
2. Full throughput simulations
3. Mapping physical behavior & timing of all components in a virtual world

EXTERNAL LINKS

Full simulation process

Detecting the bottle neck

ENGINEERINGNET
Digital Twin As a Service

Throughput analysis

Warehouse simulation and virtual testing of new concepts

⬦ CHALLENGE

Advice and recommendations are requested for ideal throughput configuration of the warehouse.

💡 SOLUTIONS

Ca
Capture

Du
Dual

Ia
Interact

◎ RESULT

- Our client and their logistic partner can now define what parameters should be varied and what metrics should be calculated
- Live execution of the simulation
- Immediate report with detailed findings
- Objective information for the ideal dimensioning of a new warehouse
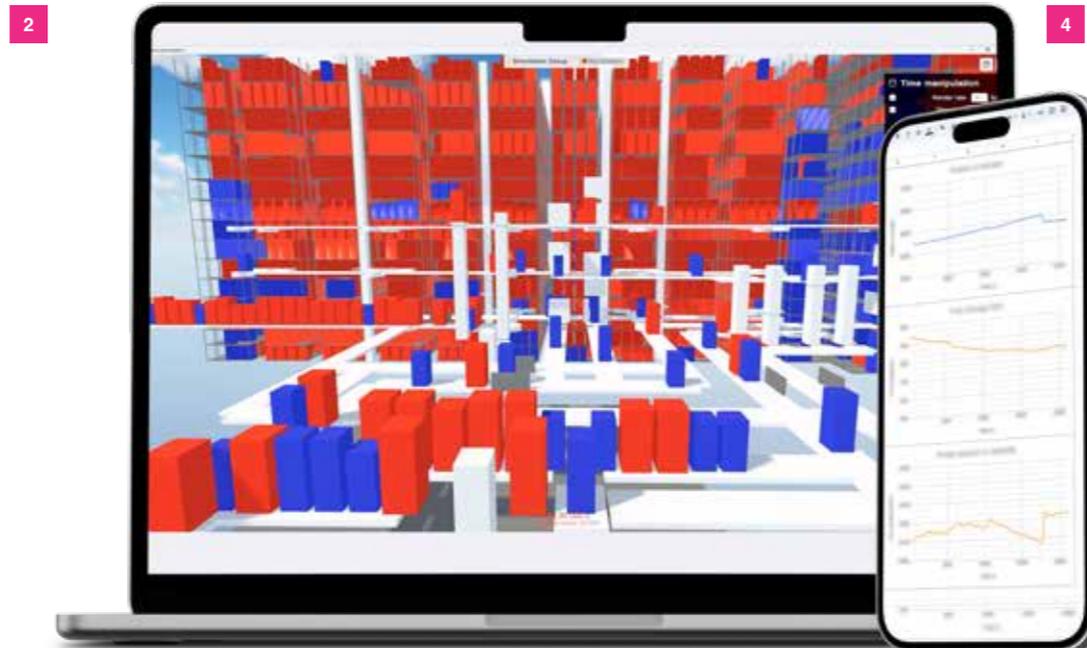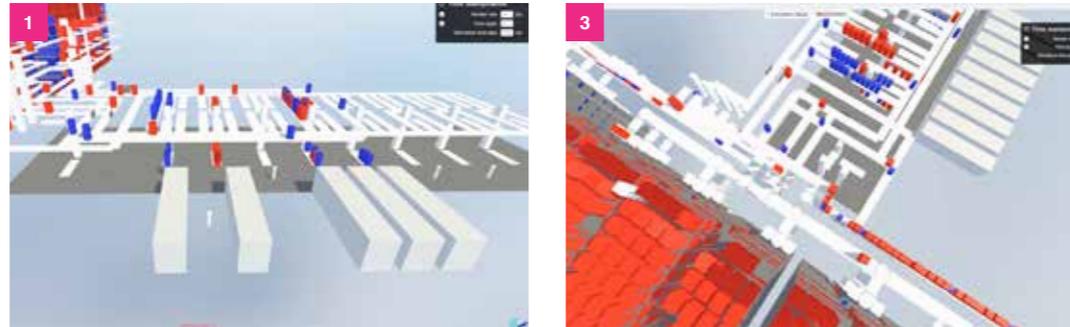
IMAGES

1. Throughput analysis from warehouse to loading docks
2. Adding traffic based on historical data
3. Different view angles
4. Conclusions and recommendations

EXTERNAL LINKS

Throughput simulation

Virtual validation

Simulation and increased testing of new warehouse flow

⬥ CHALLENGE

Simulate and validate what line-up and configuration is required to achieve a specific output KPI

💡 SOLUTIONS

| Ca	Du	Ia
Capture	Dual	Interact

◎ RESULT

- Use of DUAL editor speeds up the simulation process and the throughput analysis
- Testing different configurations virtually
- Faster iterations
- Control over dataset
- Overall improved & faster warehouse flow and development
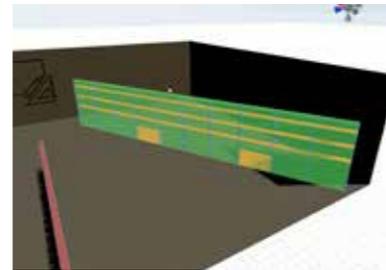
START

Assembly of large scene objects
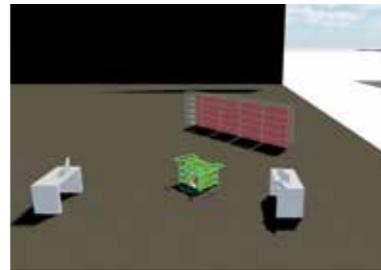
Configuration of operator details
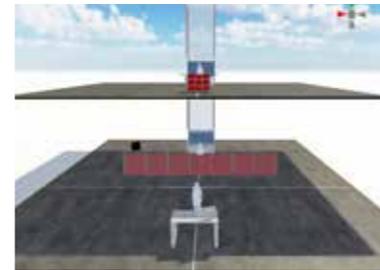
Configuration of lift

ANALYZE

Step 3 - Packing

Step 2 - Picking
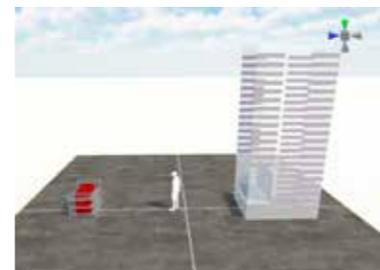
Step 1 - Binning

EXTERNAL LINKS

Multiple configuration set-up

we accelerate your industry with **autonomous systems**

autonomous systems

robotics & machine control

process automation

advanced control

model-based design

real-time embedded software stack

repetitive task automation

reducing risks & errors

Autonomous systems

Robotics & Controls for the largest autonomous shuttle warehouse in the world

⊕ CHALLENGE

Providing traffic control technology and shuttle software for the largest autonomous warehouse in the world.

🔅 SOLUTIONS

Ca Capture

Du Dual

Ia Interact

◎ RESULT

- Virtual validation and simulation - using Dual
- Rapid debugging during development - using Capture
- Throughput measurements provided real-time insight
- Realtime and web-based HMI
- Control over exceptional shuttle fleet
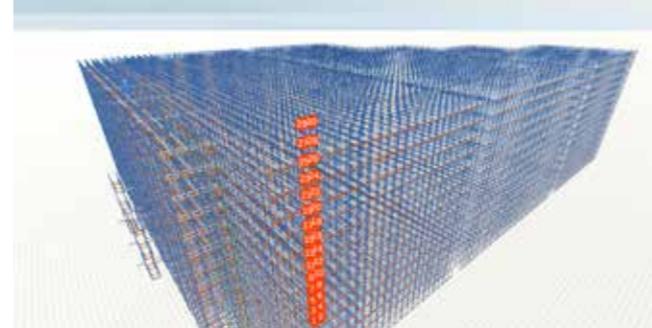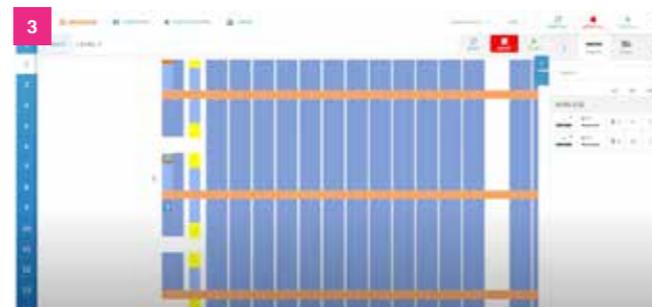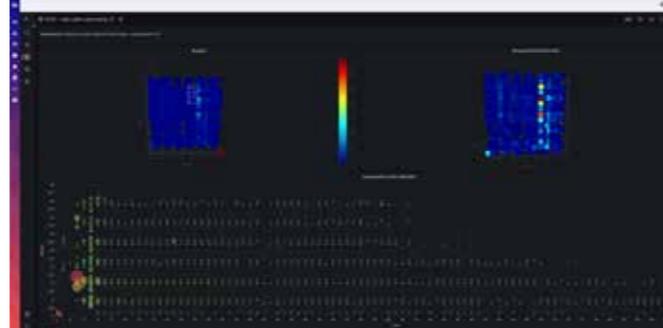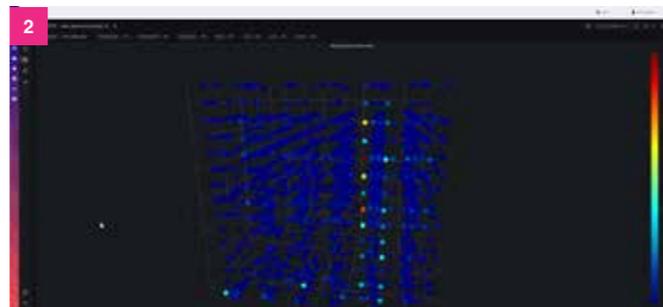
IMAGES

1. The biggest autonomous shuttle warehouse in the world is situated in Belgium
2. 3D heatmap of issues
3. Realtime and web-based HMI

EXTERNAL LINKS

Fully automated warehouse

Realtime web-based HMI

Autonomous systems

Towards an autonomous slab carrier

⟁ CHALLENGE

Controlling a slab carrier handling steel slabs of up to 900°C in a giant slab yard.

💡 SOLUTIONS

| Ca	Du	Ia
Capture	Dual	Interact

◎ RESULT

- Successful PoC
- Improved control of the vehicle
- Driver support
- Virtual study to find optimal sensor setup
- Cruise control, navigation of an articulated vehicle
- Full autonomous software stack

1

3

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5
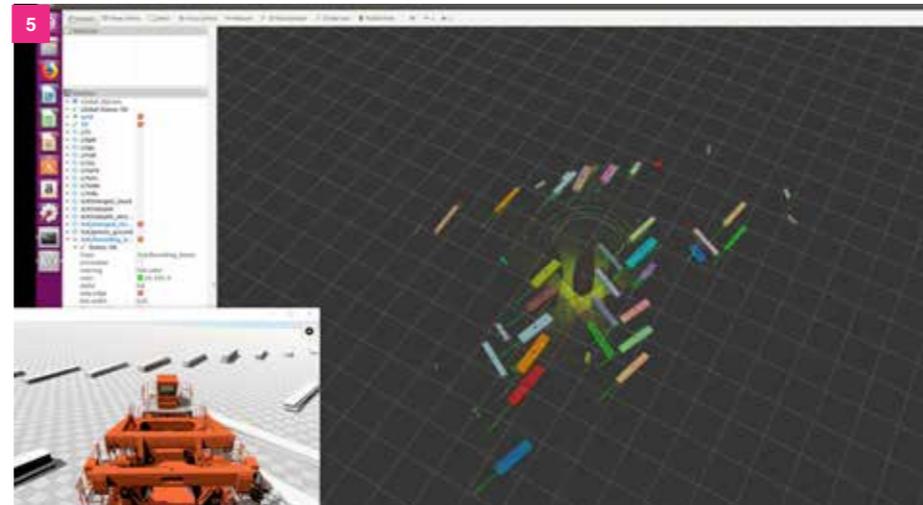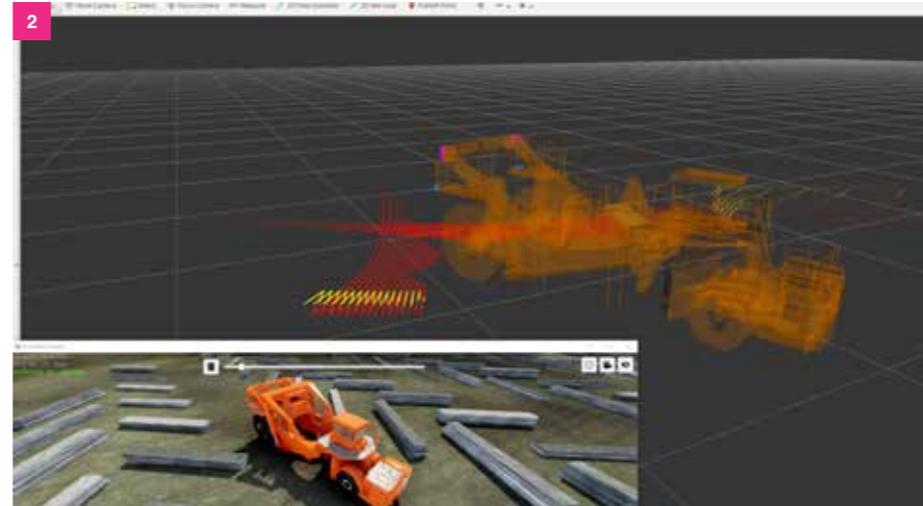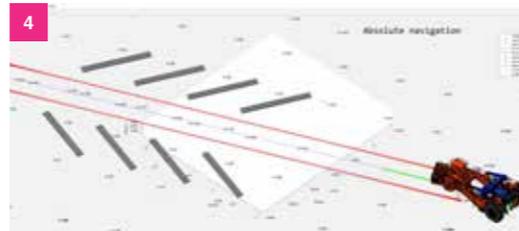
IMAGES

1. Scale of the autonomous slab carrier
2. Pile scanning to position/park the carrier before lifting
3. LIDAR sensors at work
4. Absolute & relative navigation
5. Slabyard object detection & tracking

EXTERNAL LINKS

▶ Driving & slab tracking

▶ Object tracking

▶ Navigation absolute & relative

Mechanical weeding robot

Accelerated development, facilitated by Capture

⬡ CHALLENGE

Accelerate the development of an autonomous mechanical in-row weeding robot. The robot does not use any chemicals and does not damage the crops.

💡 SOLUTIONS

Ca Capture   Du Dual   Ia Interact

◎ RESULT

- Weed position parameters are logged to better train the algorithm in controlling the mechanical weeding arm
- Machine parameters are logged to develop better and more accurate control of the bot
- Faster development in general

1

2

3

4

IMAGES

1. The mechanical weeding robot
2. Operating arm removing the detected weed
3. Dashboard of the weed data
4. Visual weed detection

EXTERNAL LINKS

Visual weed detection

Robot&arm @work

The project

Advanced control of a spray boom

Better crop potection by optimizing the spray boom control

◈ CHALLENGE

Controlling the spray height and the stability of the spray boom over a length of more than 50m, for optimal crop protection.

💡 SOLUTIONS

| Ca	Du	Ia
Capture	Dual	Interact

◎ RESULT

- DUAL made it possible to predict and to anticipate more easily to the behavior of the spray boom
- Highly variable processes, hybrid and/or data-driven models can be tested
- A better control system, leads to a better performance
- The use of simulation gave us insights to engineer newer concepts
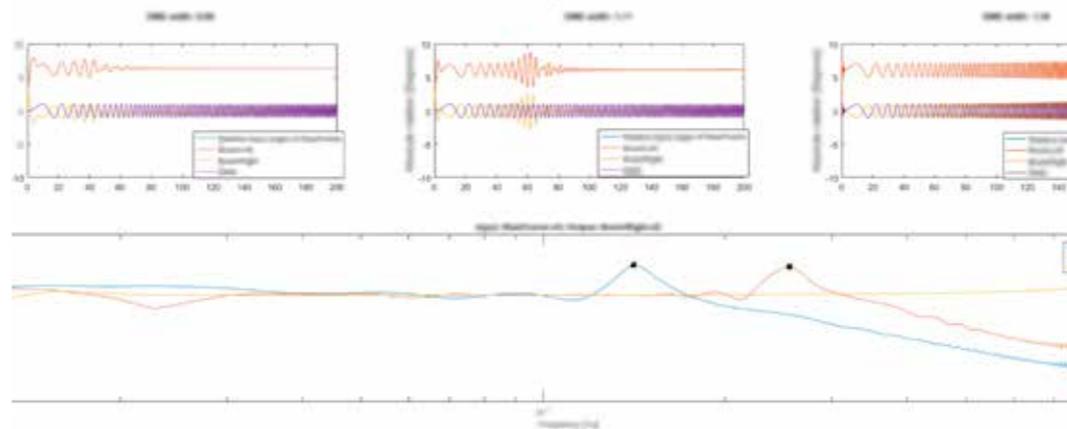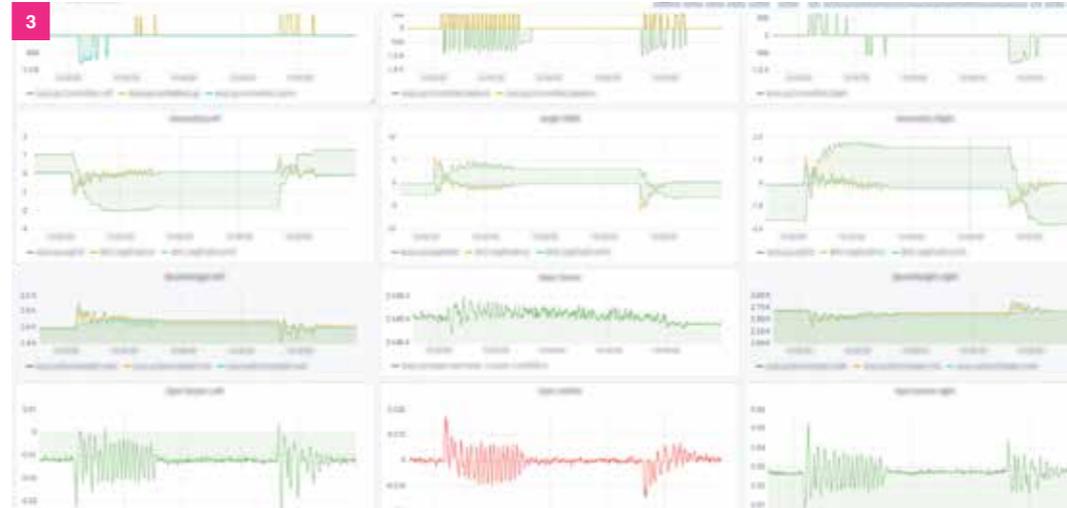
IMAGES

1. Controlling a spray boom of 57m
2. Simulation of scenarios and environmental factors in DUAL
3. Mapping the behavior of the spray boom using our data framework Capture

EXTERNAL LINKS

Digital Twin

Machine at work

we accelerate your industry with
industrial iot & data analytics

industrial Iot

fleet, device & user management

monitoring, reporting, alerting

operational insights

OEE improvement

predictive maintenance

data analytics

lifelong learning

Operational management of high tech metalworking machines

Managing a machine fleet, globally

◈ CHALLENGE

Follow up a large number of machines, globally. The complete fleet exists of both own machines and machines at customers. Allow monitoring and communication with each individual machine.

☀ SOLUTIONS

Ca Capture

Du Dual

Ia Interact

◎ RESULT

- Capture - Industrial IoT platform
- Customer dashboards
- Machine status
- Batch/job info
- Lifetime info
- Fleet management
- Remote control

IMAGES

1. Laser cutting machine Phoenix with automated loading
2. Custom dashboard - Machine status - Batch job Info

EXTERNAL LINKS

LVD Phoenix

Energy monitoring & optimization

Going the extra mile for the perfect candy

◈ CHALLENGE

Keeping track of all parameters for the production of the optimal candy.
Providing insights to optimize the process and or reduce costs.

☀ SOLUTIONS

Ca Capture

Du Dual

Ia Interact

◎ RESULT

- Capture - industrial IoT platform
- Production optimization
- Keep track of dosage
- Monitoring temperature
- Monitoring energy
- Monitoring utility
- Real-time stock/tank monitoring
- Automated reporting & alerting

IMAGES

1. Known for their hart mint
2. Energy & electricity monitoring of the machine fleet & automated weekly reports

Operational insights

Reducing scrap, waste and down time with data

◈ CHALLENGE

Centralise all available data in realtime to gain operational insights in order to improve operational excellence and OEE.

💡 SOLUTIONS

Ca	Du	Ia
Capture	Dual	Interact

◎ RESULT

- Capture on premise and private cloud
- Reduced scrap & operational costs
- Tracing of parts
- High rate data logging
- Actionable insights
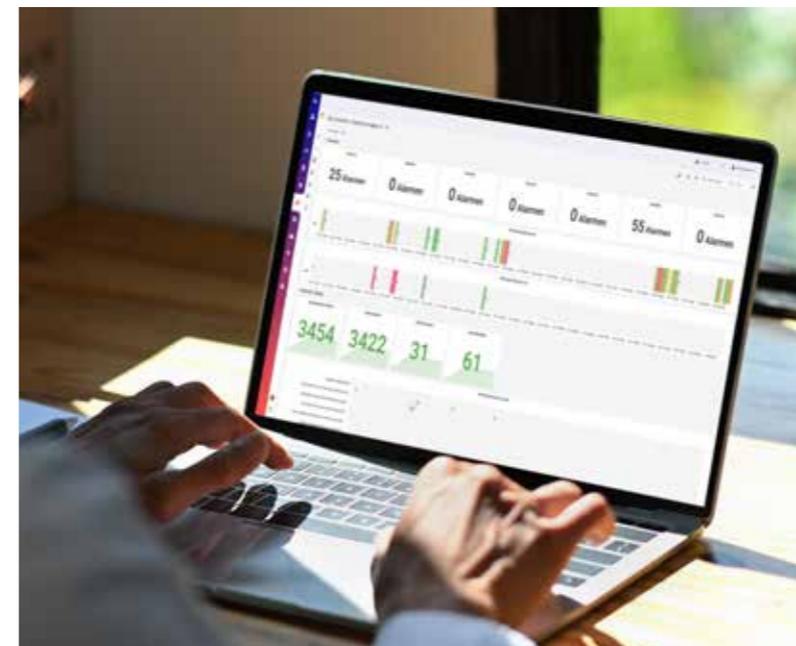
Monitoring, reporting & alerting of a shuttle fleet

Overviewing full warehouse operations in just a few clicks

⊕ CHALLENGE

Monitor, update and troubleshoot a large number of devices in the field, worldwide. Monitor operations 24/7.

🔆 SOLUTIONS

Ca Capture
Du Dual
Ia Interact

◎ RESULT

- Capture - our industrial IoT platform - allowed our client to deploy 300+ shuttles in 30+ installations worldwide in 3 years time
- Devices managed from one central cloud, cyber-secured
- Aggregated data for fast and accurate decision making
- Dual allowed full simulation

91
165
130
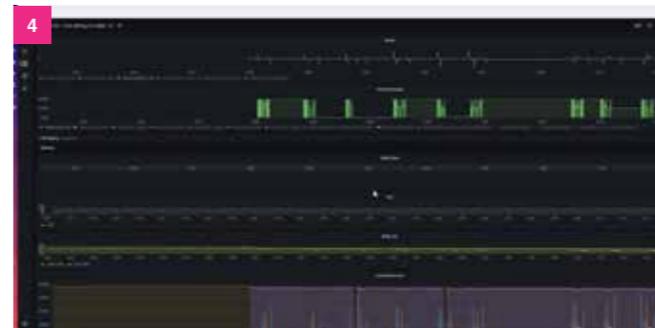
IMAGES

1. Autonomous warehouse robot
2. Development debugging
3. Autonomous warehouse robot
4. Shuttle status - for fast and remotely debugging
5. Detailed fleet overview per location/site
6. Workflow analytics

EXTERNAL LINKS

▶ Using data to check behavior

▶ stow Robotics Full range

ENGINEERINGNET
Voordelen van modelge-baseerd ontwerp

excited to **accelerate your industry**?

vintecc

we accelerate your industry