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.

collaborative

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.

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**

TAKE YOUR PICK

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

Ca

Capture
Capture accelerates your IoT journey towards full data connectivity.

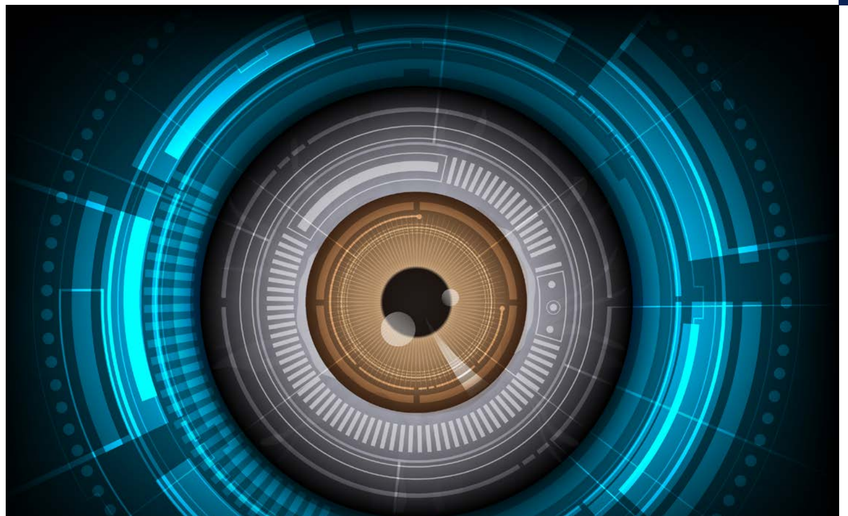
Du

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

In

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

CRUSHING MACHINERY

Product recognition & adjusting

Identifying stone fractions and their size using synthetic data

CHALLENGE

Objective measurement of stone fractions for automatic adjustment.

SOLUTIONS

Ca Capture · Du Dual · Ia Interact

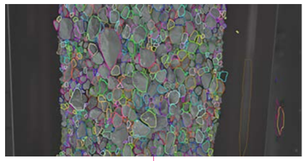
RESULT

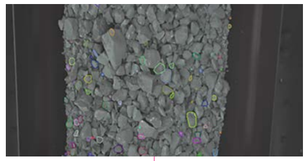
- Fast iterations without labour intensive labelling
- More control of training set
- Algorithm development before deployment
- Objective data for control input

START

Real image

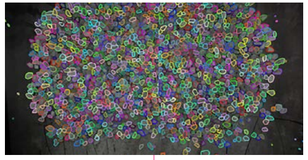
Synthetic data generation





Improved training

AI-model selection and training



DEPLOY

Instance segmentation

EXTERNAL LINKS

Simulation debris

AGRIFOOD INDUSTRY

Product inspection & selection

Combining the power of computer vision & synthetic data

CHALLENGE

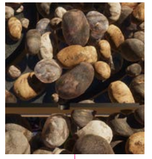
Select the best potato for the best suited potato product.

SOLUTIONS

Ca Capture · Du Dual · Ia 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



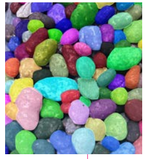
START

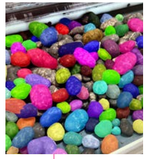
Grab texture of a real potato

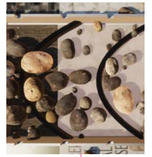
Render synthetic texture

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

FOOD PROCESSING

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

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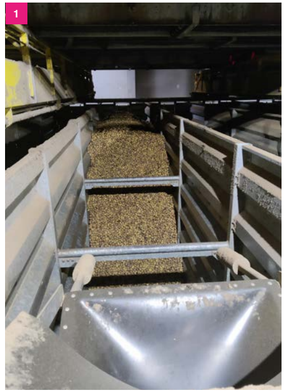

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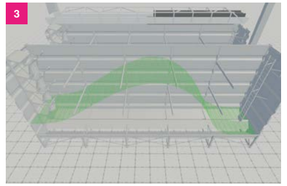

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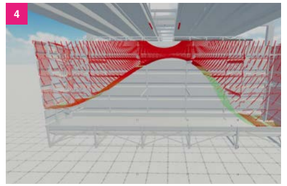

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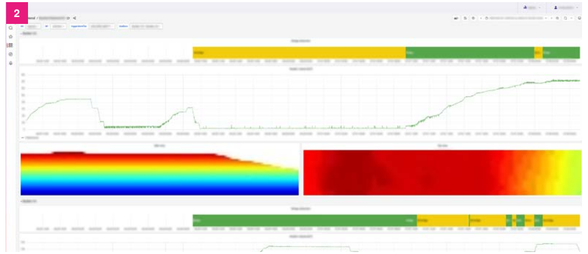


IMAGES

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

RESEARCH INSITUTE FOR FISHERIES

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 Capture

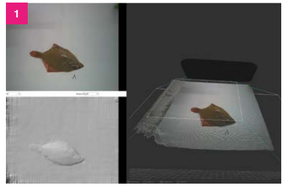
Du Dual

Ia 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

1



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IMAGES

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

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

CONCRETE PRODUCTS

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

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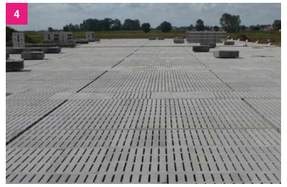

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IMAGES

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

BAKERY INDUSTRY

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

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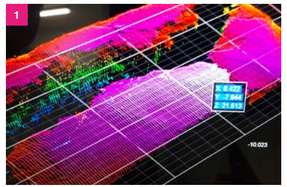

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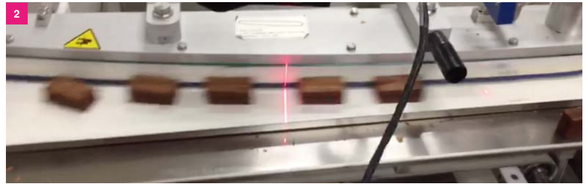


IMAGES

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

GLOBAL CERAMIC INDUSTRY

Volume scanning & measuring

Shifting from 1 daily check to continuous real time measurement

CHALLENGE

Switch from periodic checks to realtime measurement of all stock bunkers

SOLUTIONS

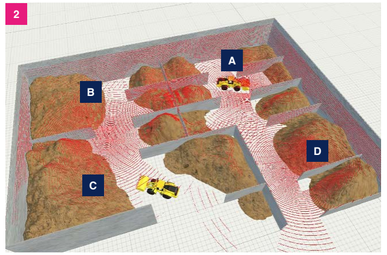
Ca Capture

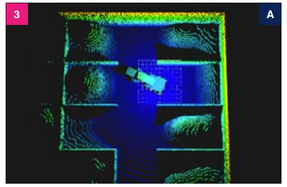
Du Dual

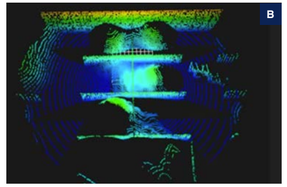
Ia Interact

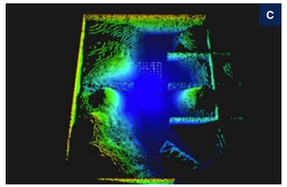
RESULT

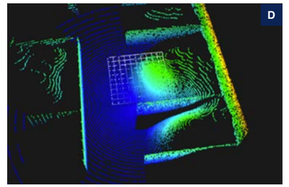
- Realtime measurements of available volume in the bunkers
- Guarantee of continuous stock
- No downtime in production
- Optimized production process
- Automated reporting & alerting of volumes in bunkers
- Consultation whether to use 4 or 5 LiDAR sensors











IMAGES

1. Stock bunker
2. LiDAR simulation
3. Realtime volume data

AUTOMOTIVE & CONSUMER SOUND PRODUCTS

Quality inspection of sound products

Training robust AI-model to see beyond the visible

CHALLENGE

- Automating a visual inspection system that could detect production errors on audio speakers.
- Teaching machines to see and understand details only experienced eyes could catch.

SOLUTIONS

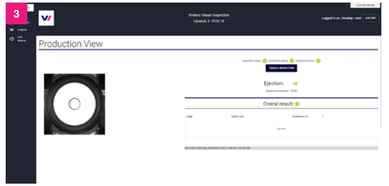
Ca Capture

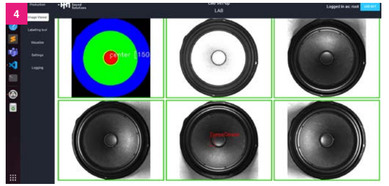
Du Dual

Ia Interact

RESULT

- Realtime product inspection, 24/7
- On-premise continuous AI-training
- Realtime insights in production
- Daily reporting & alerting
- Confirmed phase 2, quality inspection of the back of the audio speaker

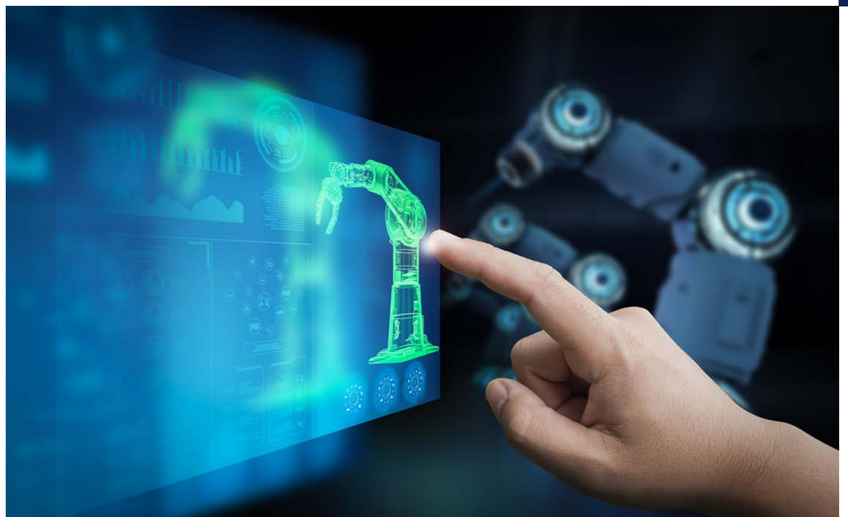




IMAGES

1. Back of the speaker
2. Back of the speaker
3. In-line product inspection
4. In-line labelling tool for on-premise AI-training
5. Production data in Capture

we accelerate your industry with **digital twins**



- simulation
- virtual optimization
- virtual validation
- virtual commissioning
- virtual prototyping
- training
- throughput analysis
- automated testing

AGRICULTURAL EQUIPMENT AND MACHINERY

Simulation & virtual commissioning

Automating a human task of a forage harvester driver

CHALLENGE

Automated spout control for automatic trailer filling.

SOLUTIONS

Ca Capture | Du Dual | Ia 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

1

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3

4

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

PORTS AND TERMINALS

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

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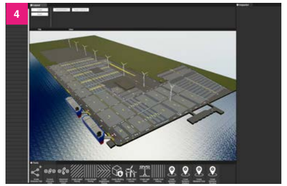

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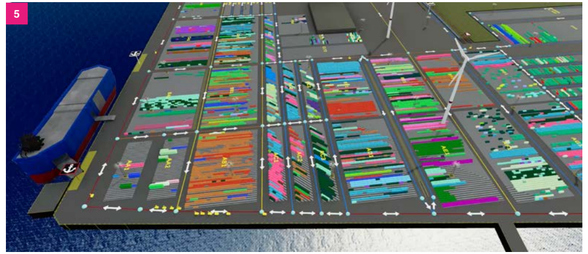

IMAGES

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

OFFSHORE AND MARINE INDUSTRY

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

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

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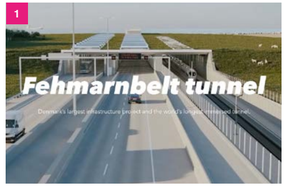

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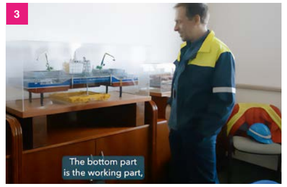

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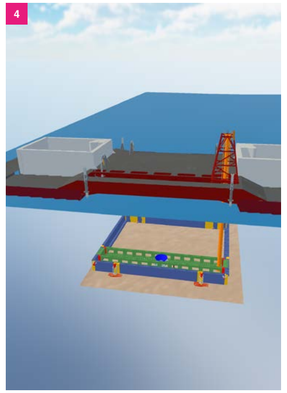

IMAGES

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

WAREHOUSE LOGISTICS

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

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

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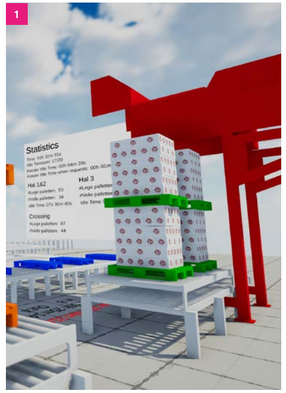

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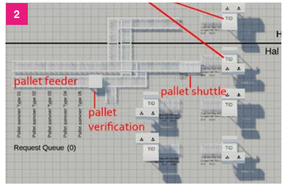

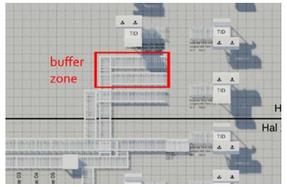

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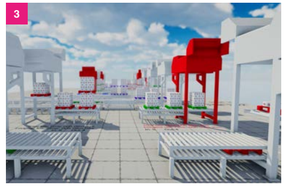
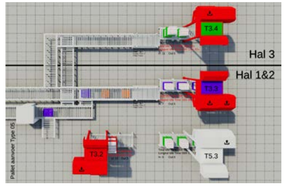




IMAGES

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

WAREHOUSE LOGISTICS

Throughput analysis

Warehouse simulation and virtual testing of new concepts

CHALLENGE

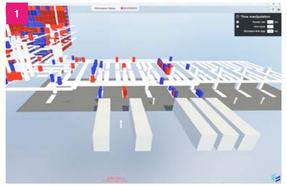
Advice and recommendations are requested for ideal throughput configuration of the warehouse.

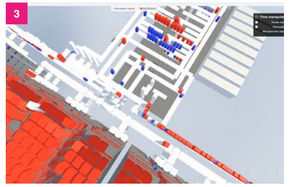
SOLUTIONS

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

WAREHOUSE LOGISTICS

Virtual validation

Simulation and increased testing of new warehouse flow

CHALLENGE

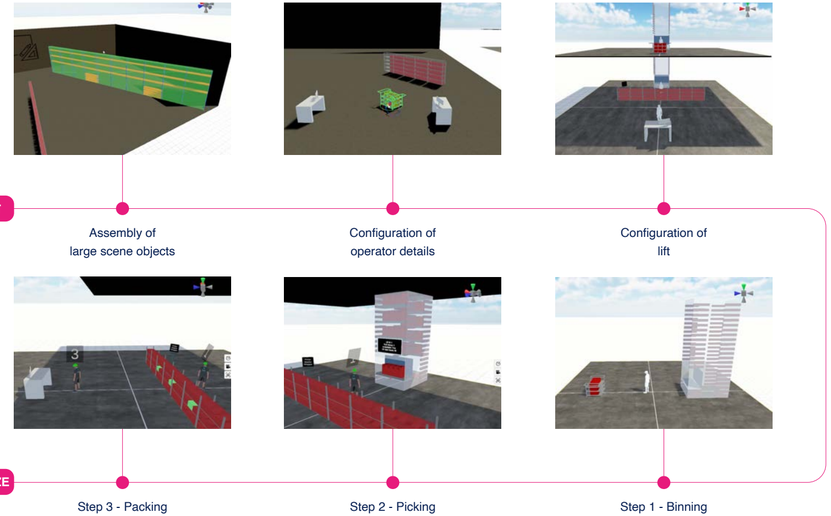
Simulate and validate what line-up and configuration is required to achieve a specific output KPI

SOLUTIONS

Ca Capture | Du Dual | Ia Interact

RESULT

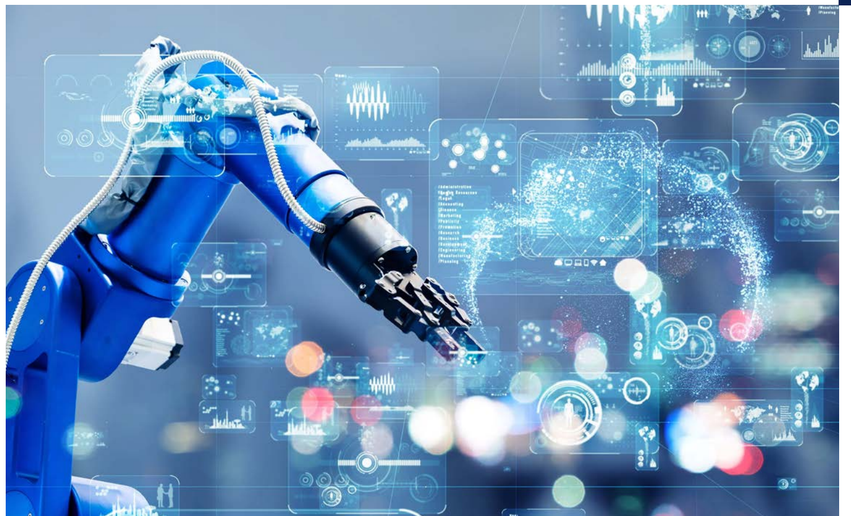
- Use of DUAL editor speeds up the simulation process and the throughput analysis
- Testing different configurations virtually
- Faster iterations
- Control over dataset
- Overall improved & faster warehouse flow and development



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

WAREHOUSE LOGISTICS

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

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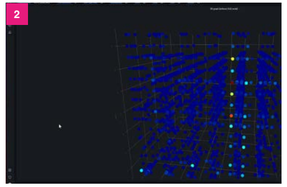

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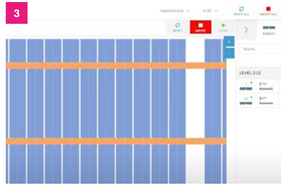

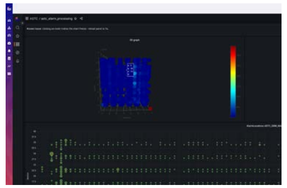

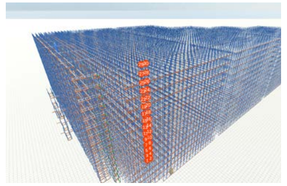

IMAGES

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

STEEL INDUSTRY

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 Capture | Du Dual | Ia 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

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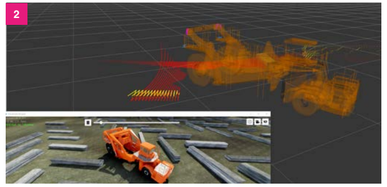

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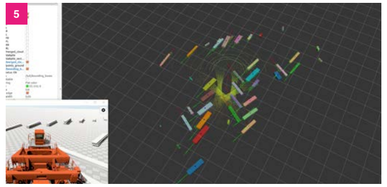

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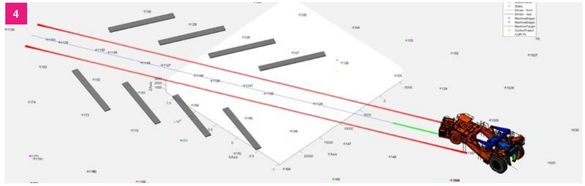

IMAGES

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

AUTONOMOUS AGRICULTURAL MACHINES

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

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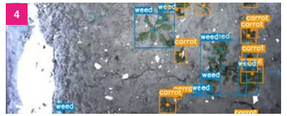

3

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

AGRICULTURAL EQUIPMENT AND MACHINERY

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 Capture
Du Dual
Ia 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

1

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3

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

OFFSHORE & MARINE INDUSTRY

Reducing (human) risks & errors

Train an underwater robot to operate autonomously in a harsh enrvironment

CHALLENGE

How to control and monitor an underwater crawler from a vessel through an auto-adaptive steering system with a +30min communication delay.

SOLUTIONS

Ca Capture · Du Dual · Ia Interact

RESULT

- Simulating the track, turns and path to develop and optimize an ideal crawler track.
- Simulating the impact of the sedimentation plume to diminish to effect on the underwater fauna.

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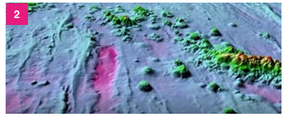

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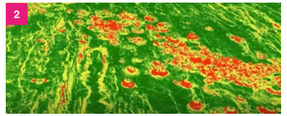

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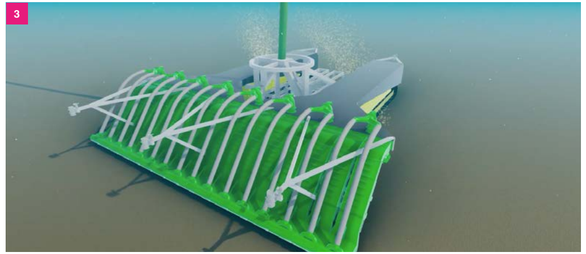

IMAGES

1. Scale of the UW-robot
2. operating area
3. Simulating path of the robot

EXTERNAL LINKS

Simulation

BALING & SORTING INDUSTRY

Textile picking robot

Traject optimization for more control, faster and smoother picking trajectory

CHALLENGE

- Increase performance and throughput of picker robot
- Optimize and smoothen the trajectories
- Improve handover speed between delta robot (3 axis) and linear gripper (1 axis)

SOLUTIONS

Ca Capture · Du Dual · Ia Interact

RESULT

- An optimized and more fluent traject with a higher throughput as a result
- Costdown: Switch from Siemens control to Linux based system
- Easy commissioning: current system took a long time to setup
- Interact HMI for operator control
- Process logging via Capture

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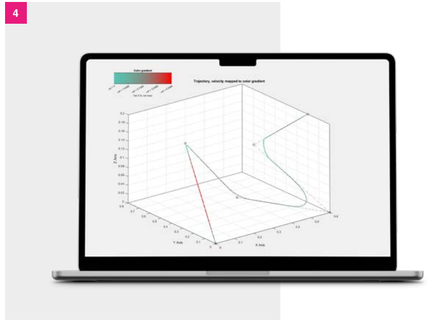

IMAGES

1. First robot picker with high tower for delta picker
2. Adjusted robot picker with low tower for delta picker
3. 3 axis delta picker and 2x 1-axis conveyor belt
4. Optimized and smoothened trajectory

EXTERNAL LINKS

Robot Picker @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

METALWORKING MACHINERY

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

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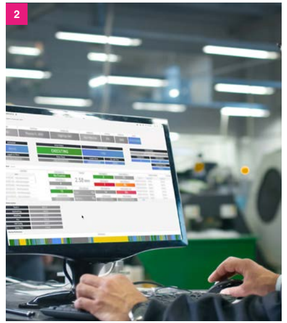


IMAGES

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

EXTERNAL LINKS

LVD Phoenix

CONFECTIONERY & CHOCOLATE

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

1

2

IMAGES

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

STEEL PROCESSING INDUSTRY

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.

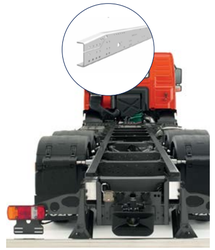
SOLUTIONS

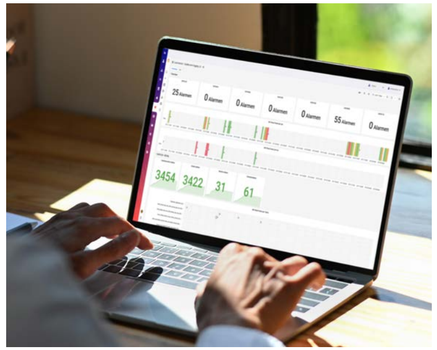
Ca Capture
Du Dual
Ia Interact

RESULT

- Capture on premise and private cloud
- Reduced scrap & operational costs
- Tracing of parts
- High rate data logging
- Actionable insights



WAREHOUSE AUTOMATION

Monitoring, reporting & alerting of a shuttle fleet

Overviewing full warehouse operations in just a few clicks

CHALLENGE

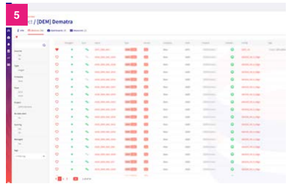
- Allow us to monitor, update, troubleshoot a large number of devices in the field. Tracing of commands, alerts, ...
- Managing device availability

SOLUTIONS

Ca Capture
Du Dual
Ia Interact

RESULT

- Capture allowed Movu Robotics 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



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

Movu Robotics Full range

ENGINEERINGNET
Voordelen van modelge-baseerd ontwerp

INDUSTRIAL GLASS PRODUCTION

Yield optimization

Optimization AI-algorithm for increased efficiency and yield in cutting glass

CHALLENGE

- Develop an optimization algorithm to cut glass - produced by an endless process – with the greatest possible yield.
- Define the patterns - using AI - for optimal cutting of the glass.
- Reduce scrap to a minimum, maximum avoid defects in the glass, while meeting all set constraints.

SOLUTIONS

Ca Capture · Du Dual · Ia Interact

RESULT

- Optimal glass cutting, 24/7
- Automated pattern definition for optimal yield of the glass slabs
- HMI for setting full range of cuttings specs incl margins of acceptance
- Higher efficiency of production and product
- Less scrap and waste

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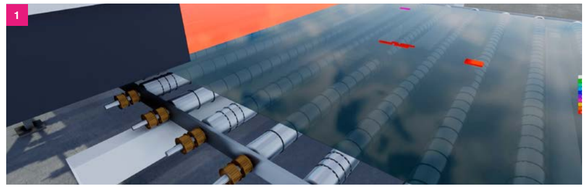

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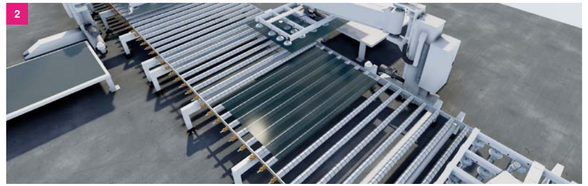

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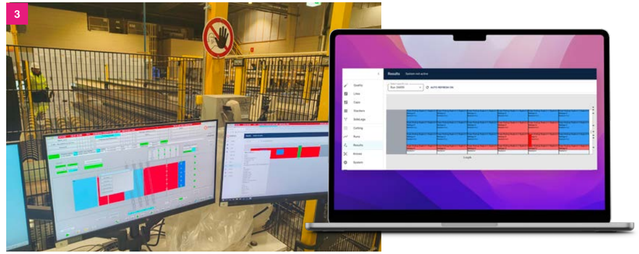

IMAGES

1. Quality inspection of glass marking all defects
2. Cutting the glass
3. HMI to set full range of cuttings specs and define the optimal cut-outs.

EXTERNAL LINKS

Optimizer

HATCHERY INDUSTRY

The double power of energy & production monitoring

A smart solution using available infrastructure

CHALLENGE

- Monitor the working stations in a production line of hatchery trolley's. These trolley's are being used in incubators.
- Mapping the productivity in-line and identify potential operational improvements.

SOLUTIONS

Ca Capture · Du Dual · Ia Interact

RESULT

- Realtime insight in the productivity of each working station
- Objective production data for further optimization
- No extra hardware needed
- Cost efficient solution
- Dashboard for energy & production monitoring

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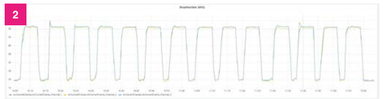

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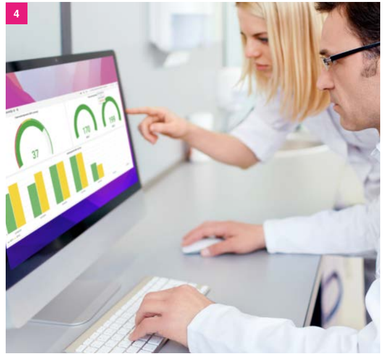


IMAGES

1. Hatchery trolley's
2. Energy peaks = Counting production of trolley's
3. Energy peaks
4. Custom dashboard – Shift performance info

BAKERY INDUSTRY

From dough to data

A journey to OEE excellence

CHALLENGE

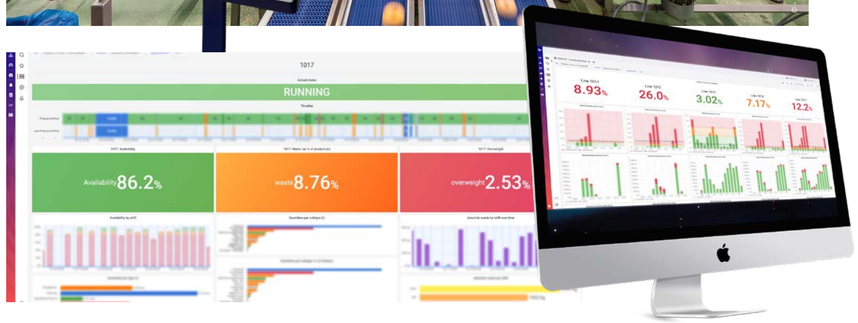
- Expand basic monitoring - between start and finish of the production process - to a complete OEE story.
- Set up a stable and robust industrial IoT architecture for 25 production lines in 8 plants across Europe.

SOLUTIONS

Ca Capture | Du Dual | Ia Interact

RESULT

- International production monitoring
- Stabil and robust IoT architecture
- Fast set-up
- Standarized hardware
- Customizable HMI per product and production line on each production plant
- Involved operators



AGRICULTURE & HORTICULTURE INDUSTRY

Seal inspection of substrate slabs

Higher quality seals for a better product and customer satisfaction

CHALLENGE

- Automatically inspect the quality of the seal based on temperature, pressure, speed and time.
- High rate data processing and analytics.

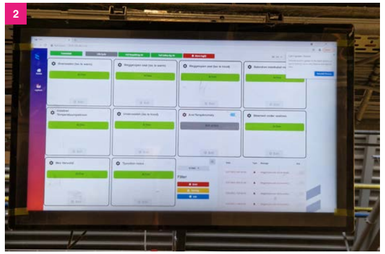
SOLUTIONS

Ca Capture | Du Dual | Ia Interact

RESULT

- Turnkey solutions for seal inspection
- Alerting and reporting of the production process
- Integrated in Roermond, Toronto and Malkinia plant
- HMI for operator and process control

START — Substrate slab is merged with plastic foil — Seal in length — Short separation seal — FINISH



IMAGES

1. Crop-specific range of substrate slabs used as a vegetable solution
2. In-line seal inspection

excited to **accelerate your industry**?

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we accelerate your industry