

FME AI FOR INDUSTRY JAAAREVENT



**Machine Vision en
andere AI-technieken
voor Quality Control**

7 december 2023

QUALITY CONTROL

AGENDA

1. Introduction machine vision with use cases
Danny Brockhoff – Silo AI
2. Machine vision demo
Arran Dinsmore - IBM
3. Product quality prediction with data & AI
Ionuț Barbu – Bright Cape



Machine Vision - Introduction with use cases

07.12.2023 Perron 038, Zwolle

Danny Brockhoff

Who we are

Europe's largest private AI lab

SILO_{AI}

What we do

Trusted AI partner. We build AI-driven solutions and products by providing world-class services and tooling.

Our vision

AI for people. A world with safe human-centric AI that frees the human mind for meaningful work.

350+ experts

175+ PhDs

200+ production-grade AI

ML | CV | NLP | LLM

Cloud | IoT | Embedded

Nordics

Finland, Sweden,
Denmark, Norway

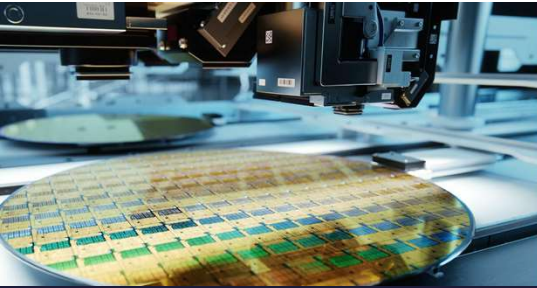
North America

United States
Canada

Europe

The Netherlands
Switzerland
Germany





Quality control:
semiconductor
fabrication



Computer vision
guided robotic
manipulation



Predictive
maintenance: factory
equipment



Waste reduction:
cardboard plant



Process optimization:
paper & board



LLM-powered voice
agent for paperless
maintenance



Energy consumption
optimization



Factory logistics and
supply chain

A few public clients and partners

PHILIPS

Allianz 



intel

Danske Bank



ASMPT



FINNAIR



RAMBOLL



AURIA
BIOBANK



MEYER TURKU
SHIPYARD 1737

Unilever



kemira

FEON

MySpeaker



VAISALA



GROKKE

What is machine vision?

- Functionality
- Advancements
- Adoption within industry



Requirements

■ Hardware

- Image sensors
- Lights
- Processor

■ Software

- Quantitative evaluation
- Algorithmic speed



Benefits

- Consistently reliable
- Increase in efficiency
- Reduction in costs
- Compliance
- Real-time feedback
- Enhanced safety





Automatic identification of defects for sewage pipes

We developed a computer vision-based solution that learns from each defect, and continuously improves the level of automation.

A solution for a labor-intensive task to monitor blockages, leaks and foreign objects within pipes monitored via video.

The computer vision-powered solution analyzes live video and flags the defects to a human operator to be verified.

Enables faster, more efficient and reliable identification of defects.



INDUSTRY

Civil Engineering and infrastructure

CLIENT

Major energy and infrastructure company in Sweden

TECHNOLOGIES

Computer vision, Visual anomaly detection

DELIVERABLES

AI solution for automatic defect identification
Annotation tools and platform using Silo OS infrastructure

SILO OS

Annotation platform
Development platform
Operation platform





Visual quality control for the pharma industry

Together with Körber, the biggest company builder for manufacturing efficiency in Germany, we developed a visual quality control solution for pharma industry inspection machines to control the quality of Covid19 vaccine ampoules.

Körber's modular solution provides one service for all inspection machines. The applied edge AI solution ensures fast and accurate inference optimized on precisely selected hardware, where a process of fast image delivery has been established.



"It has been valuable to work closely with Silo AI, as there are often specific topics related to for example edge AI, for which we don't have the right skill in-house. Working in partnership with a private research lab to access leading AI scientists with needed high-quality skills has been beneficial and something we plan to continue also going forward."

Daniel Szabo
CEO at Körber Digital



INDUSTRY

Industrial,
Manufacturing

CLIENT

Körber Digital, the biggest
company builder for
manufacturing efficiency in
Germany.

TECHNOLOGIES

Computer vision,
Machine Learning, Edge
AI, Embedded SW

DELIVERABLES

Visual Quality Control
(VQC)





Automated solution for visual quality control

A computer vision solution to identify visual features and to automatically capture accurate measurements.

We developed computer vision-based smart solution that learns visual features of each passing flaw, and continuously improves its level of automation and accuracy.

The solution improves overall product quality and processes, leading to more efficiency and fewer quality reclamations.

GLOBAL PRODUCER OF
FORESTRY PRODUCTS

INDUSTRY

Forestry,
manufacturing

CLIENT

A leading provider of renewable solutions in
packaging, biomaterials, wooden
constructions and paper globally.

TECHNOLOGIES

Computer vision,
machine learning

DELIVERABLES

AI based solution for quality control





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Lead Solutions Architect

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Europe's largest private AI lab

SILO_{AI}

Machine Vision Demo



Short Intro



- AI & Asset Performance Management Technical Specialist
- 2 years working with IBM Solutions that have a focus in sustainability: EAM, APM, IoT, AI
- Academic background in computer science & robotics



Product Quality Prediction with Data & AI

Achieve improved product quality with Manufacturing Analytics

Ionuț Barbu – Lead of Data Science

Content

- Introduction Bright Cape
- Process control with Product Quality Prediction
- DEMO
- Challenges and learnings

Optimize operations using data



manufacturing

- operational control
- resource optimization
- yield, energy, throughput, quality optimization
- maintenance optimization



logistics and warehousing

- operational control
- transport & network optimization
- emission-costs optimization
- warehouse optimization

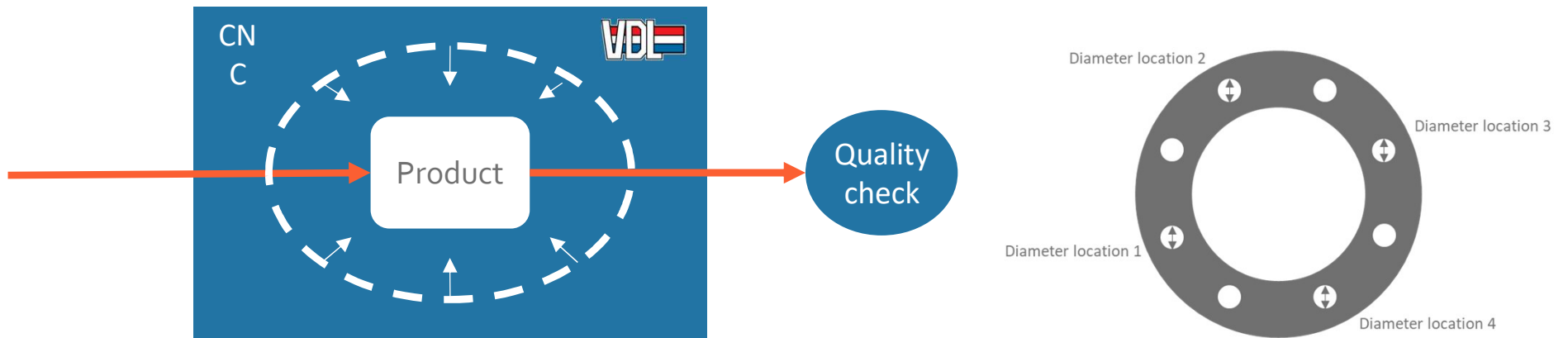


finance and banking

- operational control
- risk & compliance

VDL moved from Quality Control to Process Control

EXAMPLE



VDL moved from Quality Control to Process Control



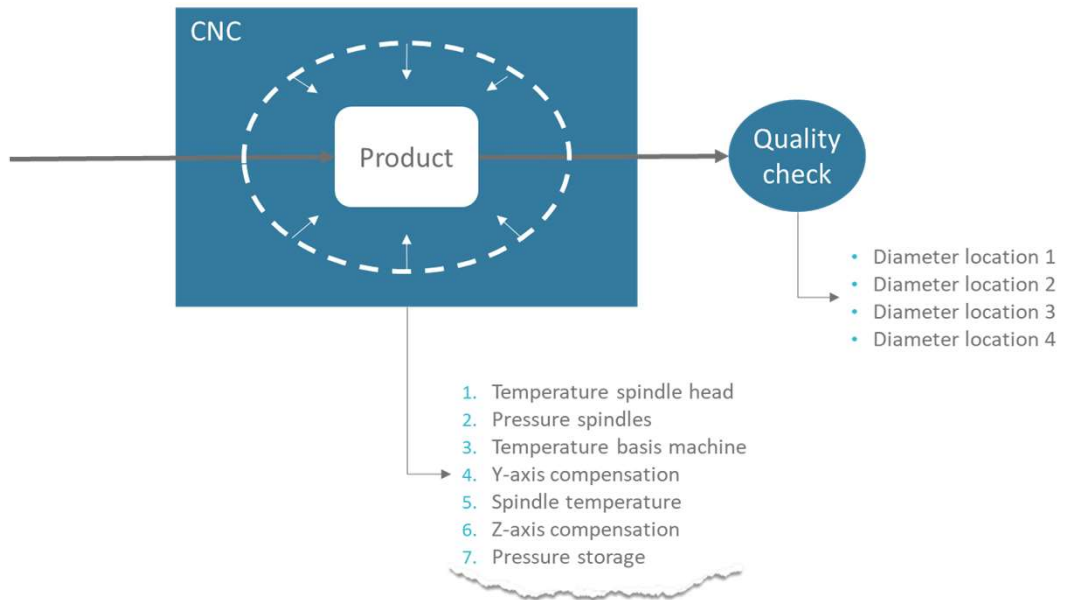
Anomaly detection



Statistical Process Control



Product Quality Prediction



VDL moved from Quality Control to Process Control



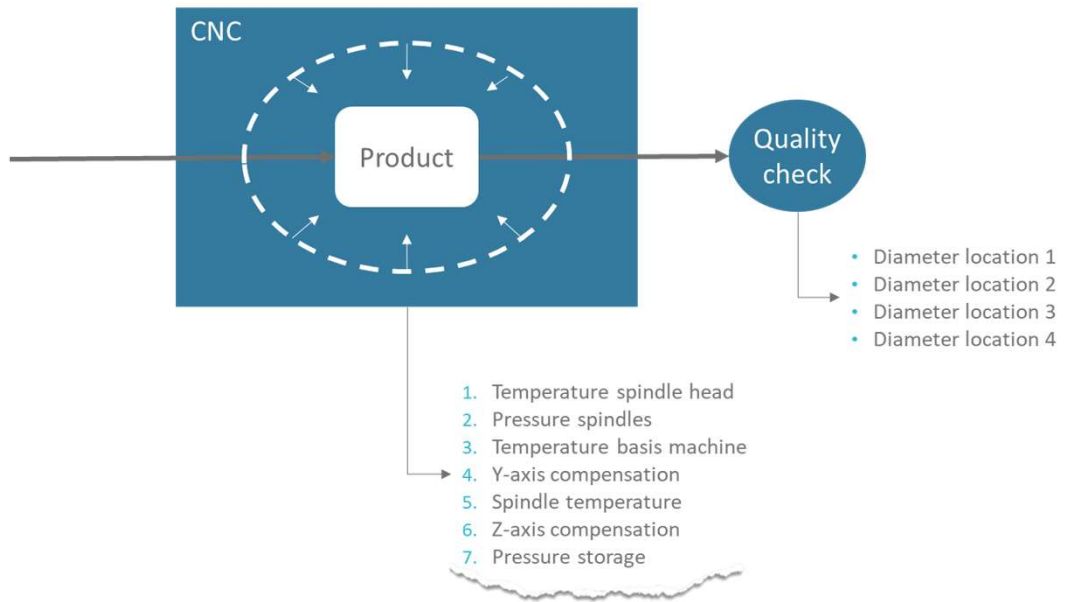
Anomaly detection



Statistical Process Control

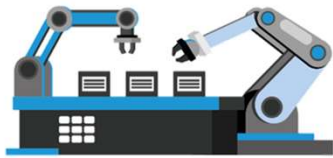


Product Quality Prediction



Product Quality Prediction in a nutshell

1



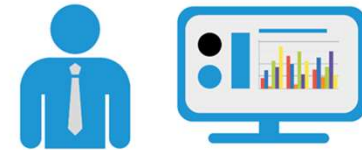
Retrieve existing/new data from the existing infrastructure

2



Analyse process & quality parameters

3



Feed actionable results into a user-friendly interface to enable timely intervention

DEMO



Product Quality Prediction will enable for VDL

- Indicate product is faulty

Benefit ✓

- 100% automated quality check

- Indicate during production product will be faulty

Benefit ✓

- Continuous production monitoring
- Save production capacity

- Indicate when to calibrate machine or replace tooling

Benefit

- Reduce production of scrap
- Cost reduction (max. tool usage)

- Indicate how to intervene to get right products

Benefits

- Reduce production of scrap
- Improve machine capability (e.g. 5 um -> 3 um)

- Automatic intervention of model within machine

Benefits

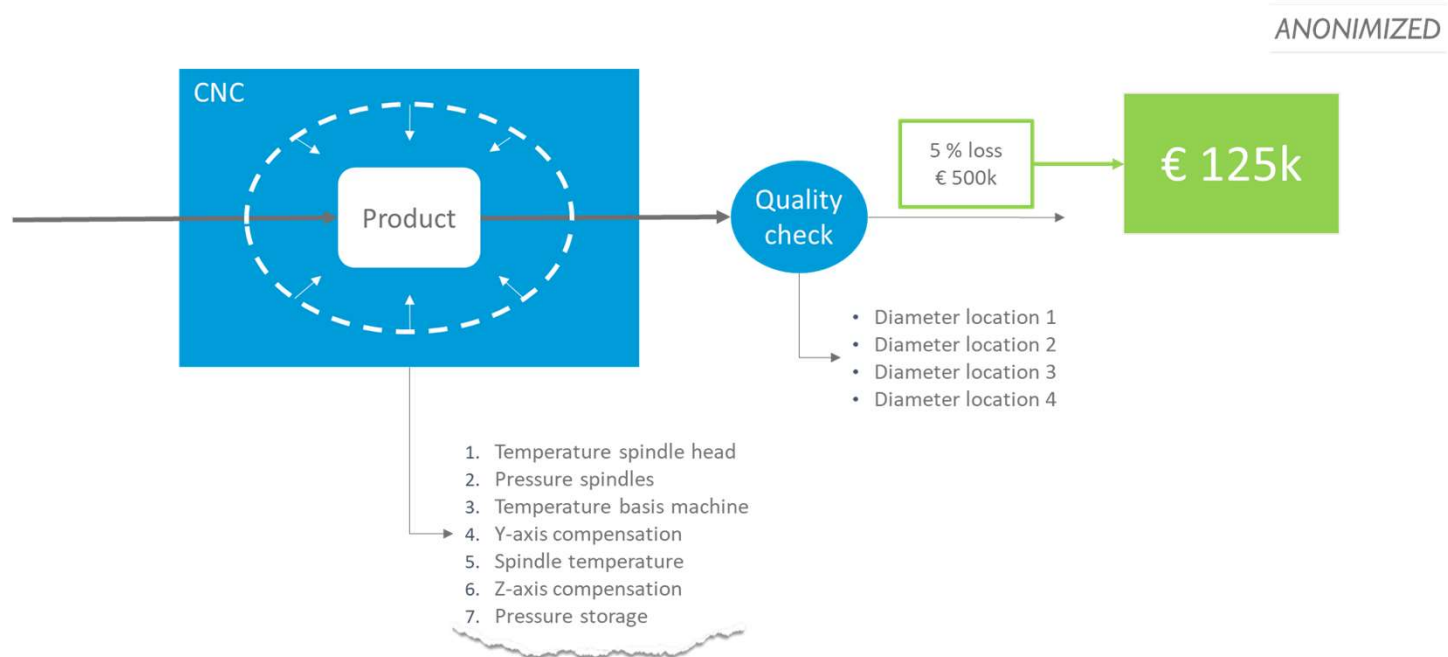
- Reduce production of scrap
- Improve efficiency and uptime

- Assist in programming the milling program

Benefits

- Reduce production of scrap
- Cost reduction (allowable milling speed)

Process control will enable scrap reduction and save production capacity



THINK BIG

Six key ingredients for succesful transition to a data-driven organiation

1. Business-led strategic roadmap

Het senior leiderschapsteam afstemmen op de visie, waarde en roadmap voor de transformatie. Bedrijfsdomeinen opnieuw uitvinden om uitstekende klantervaringen te leveren en kosten te verlagen



2. Talent

Zorg ervoor dat u over de juiste vaardigheden en capaciteiten beschikt om te innoveren en uit te voeren



3. Operating model

Verhoog de acceptatie van de organisatie door business, operations en technologie samen te brengen



4. Technology

Maak technologie gebruiksvriendelijker voor teams, zodat ze kunnen blijven innoveren



5. Data

Verrijk data voortdurend en maak deze toegankelijk in de hele organisatie om de klantervaring en bedrijfsprestaties te verbeteren

6. Adoption and scaling

Maximaliseer het vastleggen van waarde door te zorgen voor de acceptatie en bedrijfsschaling van digitale oplossingen



Thank you

Bright Cape B.V.

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Lead of Data Science



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Selected clients

Every organization needs its own approach. Bright Cape leverages its experience of successful implementations with a wide variety of clients from all kinds of industries.

ProRail

DAF



Ministerie van Defensie

ING

VDL

TR/01#03
TR/01#03



NUNNER
LOGISTICS

SEARCH... 001
SEARCH... 001

KPMG

Hertek

DATACON

DHL

ABN·AMRO

Medtronic

ASML

TR/01#03
TR/01#03

PHILIPS

TR/01#03
TR/01#03

e.on

RS/011
RS/011

NXP

RS/0211TR /DN
RS/0211TR /DN

QUALITY CONTROL

Bedankt voor je aandacht!

Volg van het FME Platform AI for Industry ook een AI Deep Dive sessie over Machine Vision en andere AI-technieken voor Quality Control

Meer informatie:

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- Arran Dinsmore - IBM: Arran.Dinsmore1@ibm.com
- Ionuț Barbu - Bright Cape: i.barbu@brightcape.nl

FME AI FOR INDUSTRY JAAREVENT



**Bedankt voor
je aandacht!**