





KICMPI, 23/10/12

*Better maintenance insights at your fingertips*



# SkyeBase

## Visie

Industriële assets zullen **veiliger, ecologischer, data-driven,** en **efficiënter** worden door de inzet van hoog technologische gerobotiseerde inspecties, data technologie en digitale transformatie.





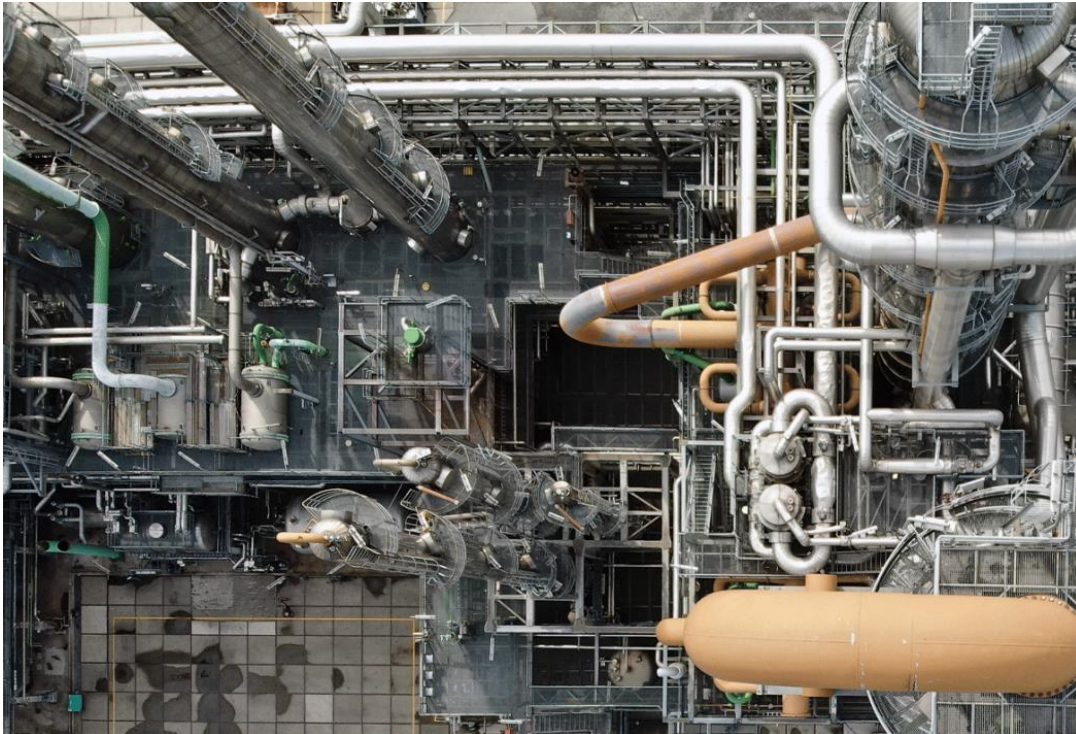
# Wie is SkyeBase?

- SkyeBase is een total solution bedrijf, opgericht in 2020
- Ontwikkeling van asset inspectie platformen en uitvoering van gestructureerde datacaptatie
- Focus op procesindustrie, tankterminals, containerterminals en infra
- Ons platform I-Spect ondersteunt om asset inspectie data te verwerken tot bruikbare inzichten
- Inzet van drone technologie, data technologie en digitale transformatie ter verhoging van veiligheid, verlaging ecologische risico's, verhoging uptime en verlaging kosten



# Het Probleem

De manier waarop inspecties worden uitgevoerd is niet aangepast aan de dag van vandaag



Tijdsintensief &  
onveilig

Beperkte inzichten

Krappe  
arbeidsmarkt

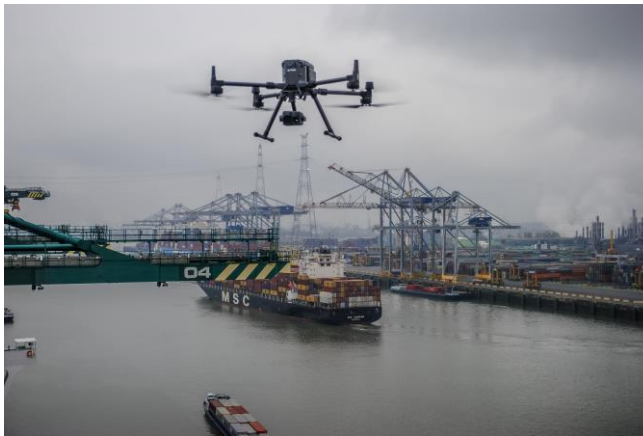
Verlies van kennis

Gedecentraliseerde  
(papier)  
informatie

# De nieuwe manier van asset inspecties – DT<sup>3</sup>

Drone & Robot Technologie, Data Technologie, Digitale Transformatie

## Drone & Robot Technology



Coherente, gestructureerde en veiligere inspecties

## Data Technology



AI- en machine learning technieken leveren betere en bruikbare inzichten op voor snellere en meer accurate onderhoudsbeslissingen

## Digital Transformation



Digitale rapportage zal resulteren in een betere planning van preventief onderhoud.

# Wat is AI?

## **ARTIFICIAL INTELLIGENCE (AI)**

Programming systems to perform tasks which usually require human intelligence

## **MACHINE LEARNING (ML)**

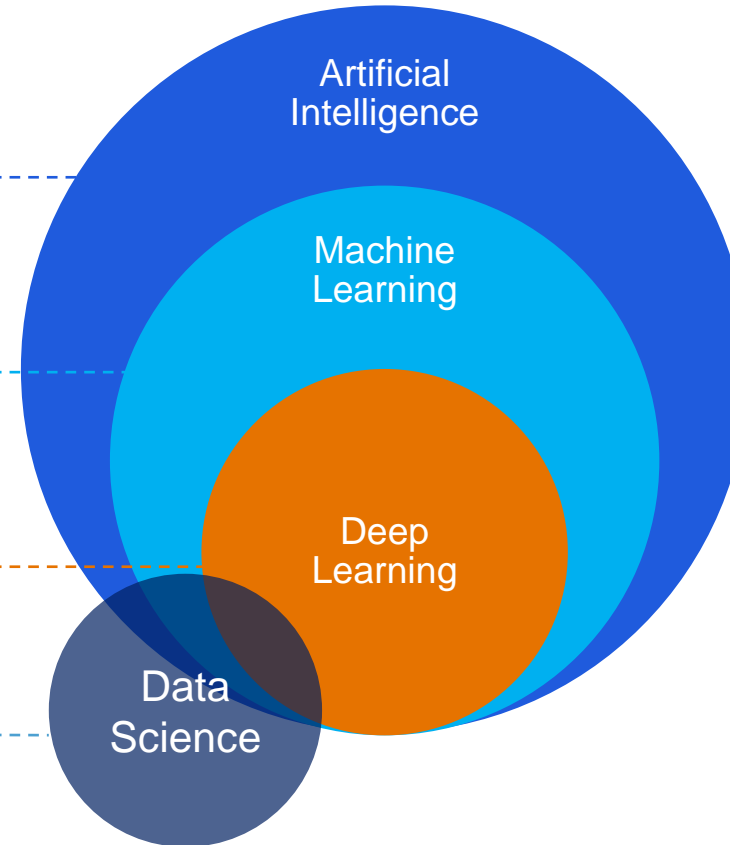
Training algorithms to solve tasks by pattern recognition instead of specifically programming them how to solve the task.

## **DEEP LEARNING (DL)**

Training algorithms by using deep neural networks with multiple layers

## **DATA SCIENCE (DS)**

Providing meaningful information based on large amounts of data

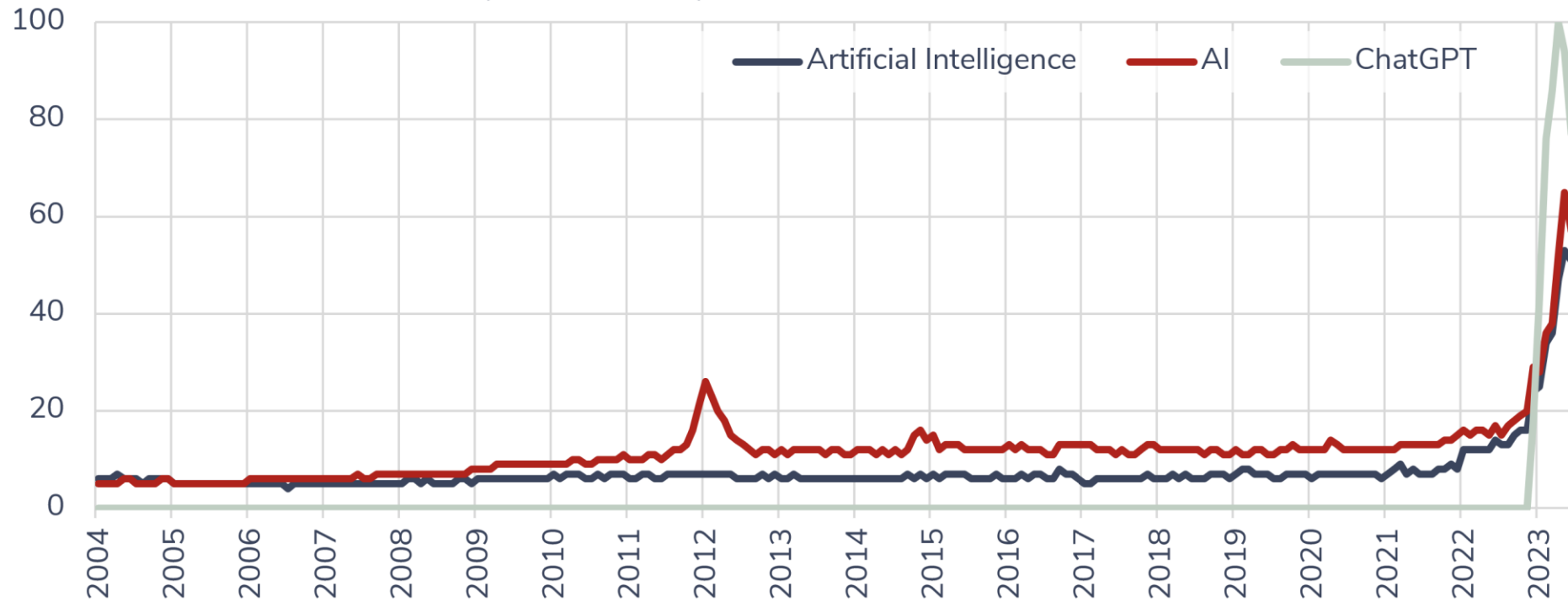




# Interesse in AI?

**Figure 1: Google Search Terms**

Interest Over Time (Normalized)



Source: Google Trends



# Verschillende AI taken

## Beter begrijpen wat de mogelijkheden van AI zijn

### Staal:

- Roestdetectie met segmentatie
- Putcorrosie vs. gewone corrosie
- Detectie van laslijnen
- Detectie van moeren en bouten
- Staalscheur
- Alle modellen combineren

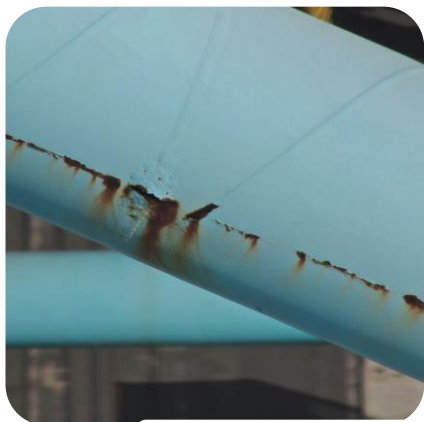
### Beton

- Detectie van scheuren
- Detectie van slijtage
- Waterschade
- Metselwerk
- Alle modellen combineren

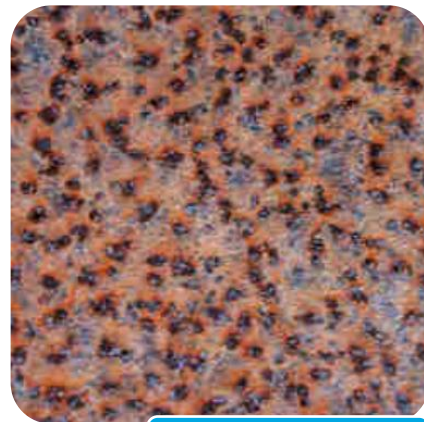
### Overig:

- Objectgrootte berekenen met de afstandsensor
- Berekening objectgrootte zonder afstandssensor
- Beeldcompressie
- Superresolutie
- Beeldfusie
- Nieuwe algoritmen voor beeldherkenning
- Live AI
- MLOps en 3D AI-onderzoek

# Gecombineerde staal modellen



Roest



Pitting



Roest moer & las

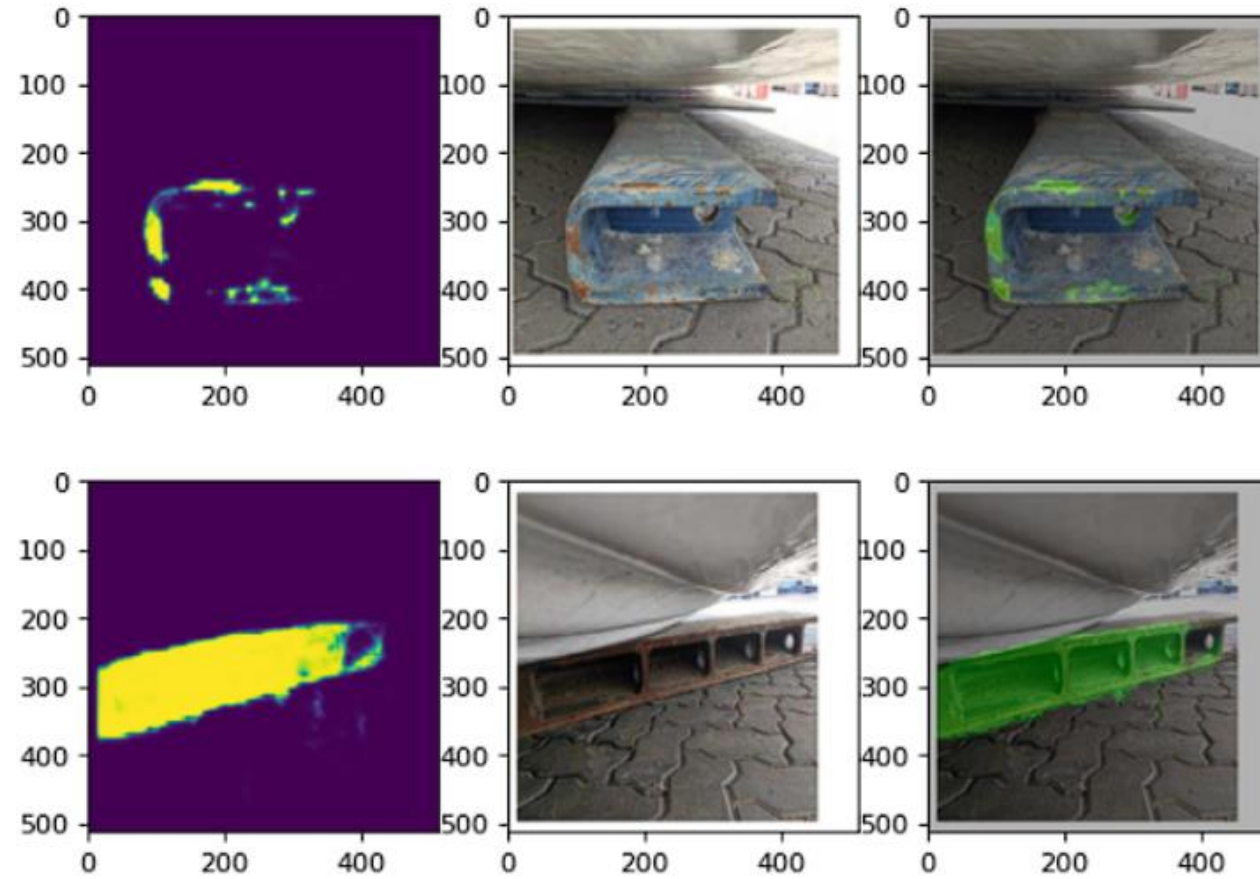


Asset Condition Rating	Priori Repair
Excellent	5+ y
Very Good	3-5 y
Good	2-3 y
Fair	within
Poor	Imme
Very Poor	Res

Conditie Score

# Staal

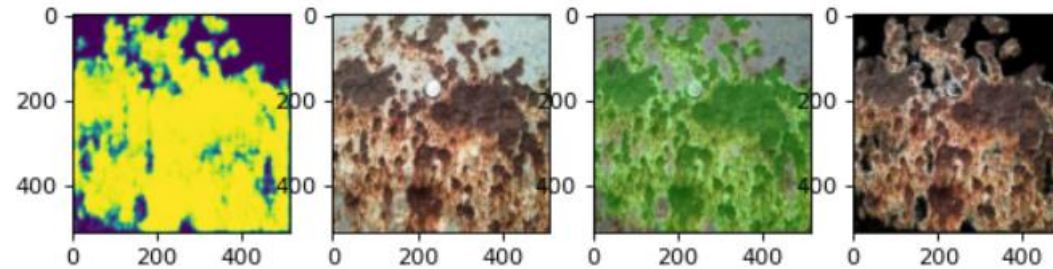
## Roest segmentatie



# Staal

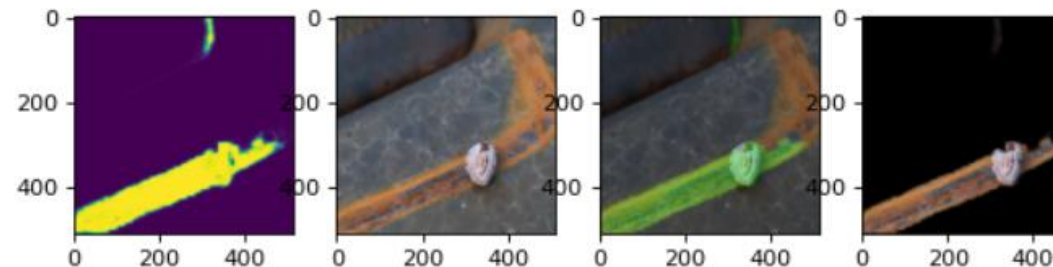
## Pitting versus normale corrosie

0.181714505041771



A (pitting corrosie)

0.7562901503307458



B (reguliere corrosie)



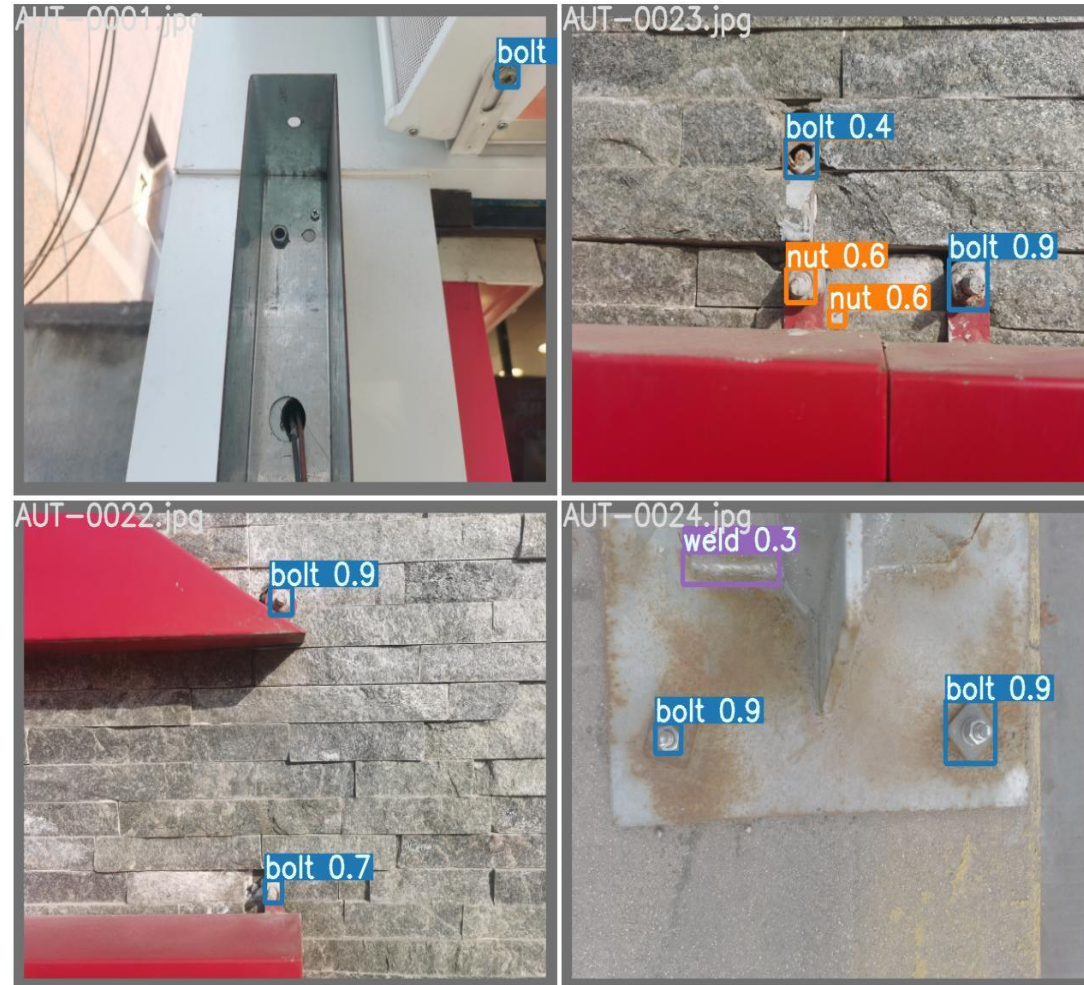
# Staal

## Las detectie



# Staal

## Detectie van bouten en lassen



# AI ondersteunde rapportage

Real-time AI defect analyse





# Beton



Scheur + lengte



Afbrokkeling



Waterschade



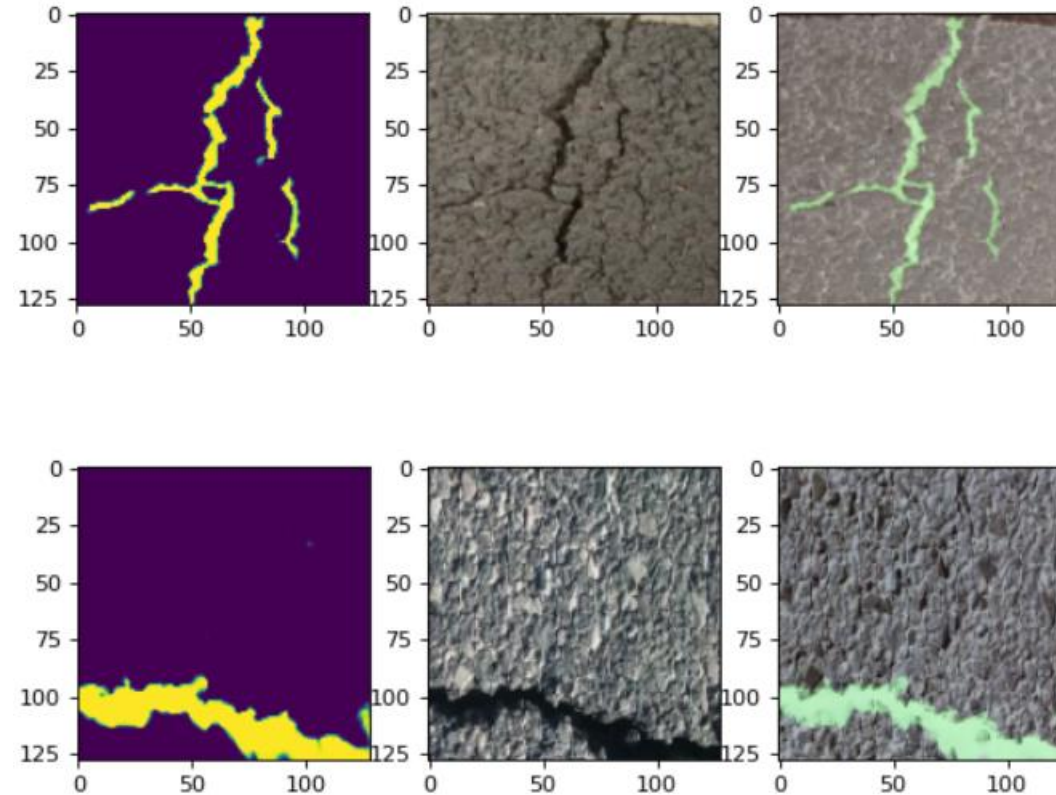
Condition	Asset Condition Rating Outcome	Priority Repair
	Excellent	5+ y
	Very Good	3-5 y
	Good	2-3 y
	Fair	within
	Poor	Imme
	Very Poor	Re

Conditie Score



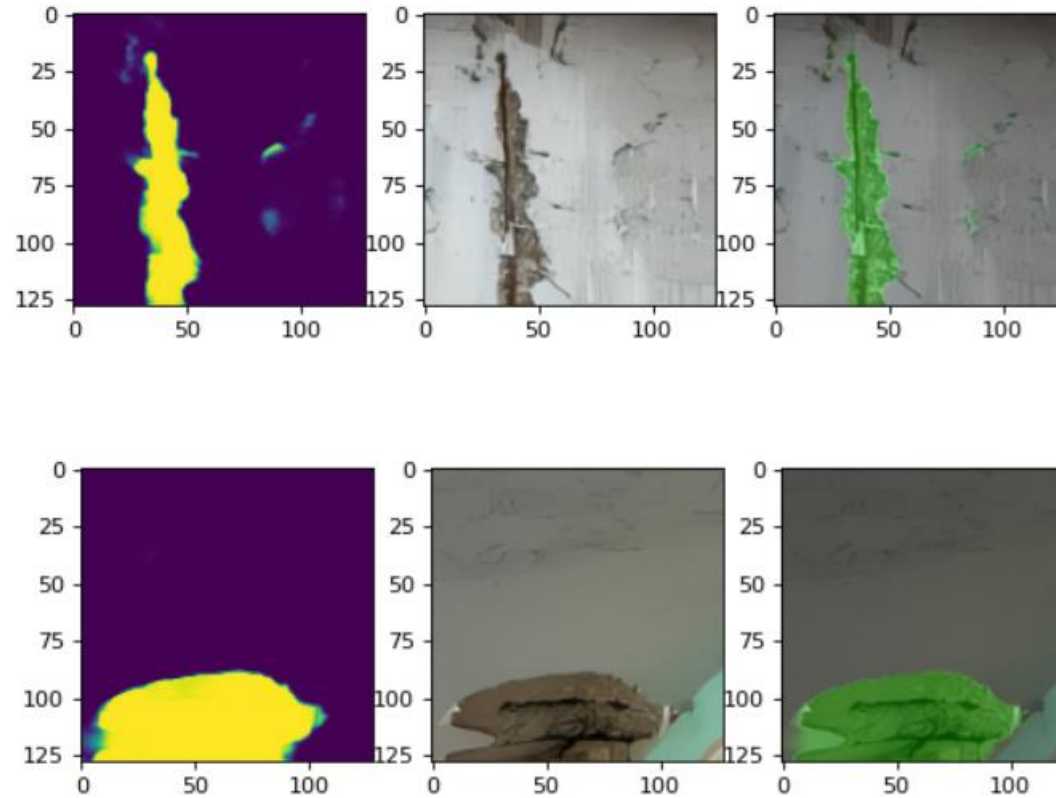
# Beton

## Scheuren



# Beton

## Loskomende betondelen



# Beton

## Water schade

positive



negative



positive



positive



negative



positive



positive



positive



positive



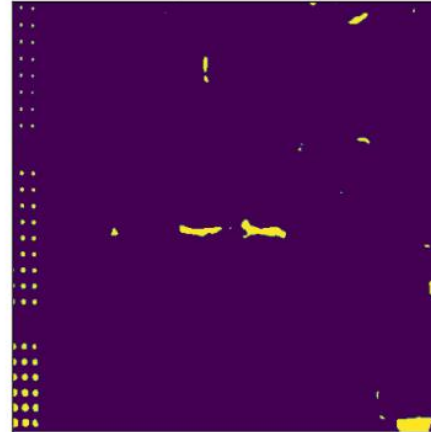
# Beton

## Metselwerk defecten

Original Image



Improved mask



Improved mask

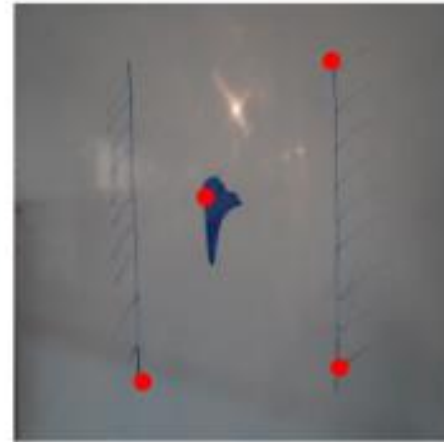




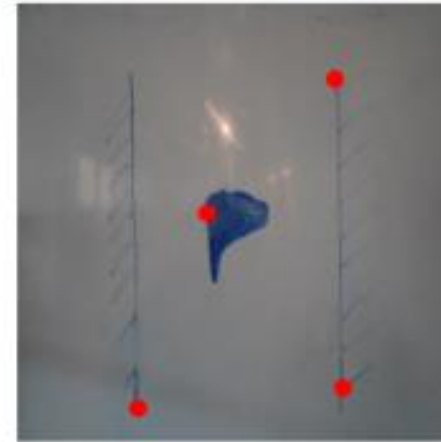
# Overig

## Beeld vergelijking en defect evolutie

IR image



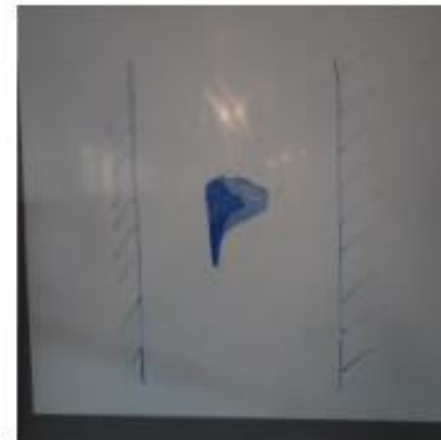
Original RGB image



Corrected RGB Image



RGB + IR



# Defect analyse dashboard

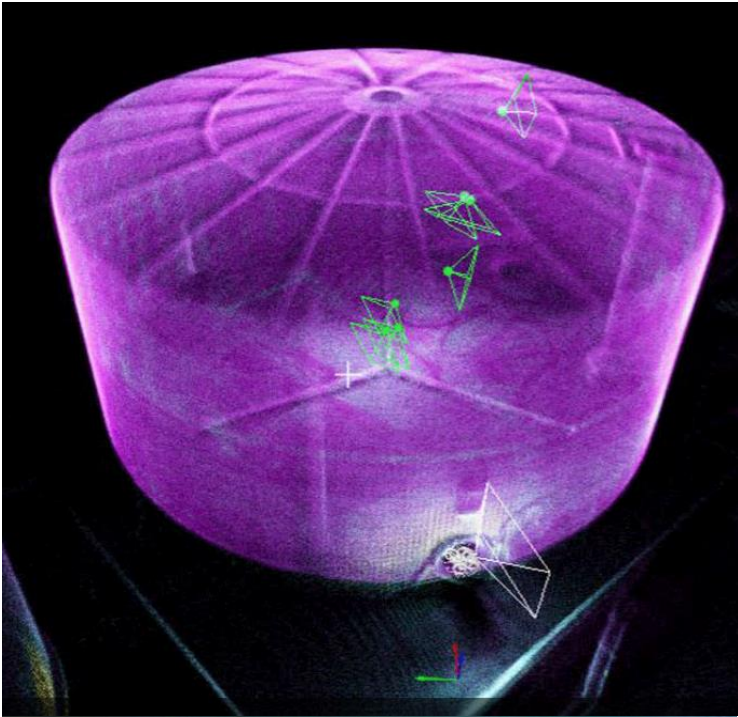
I-Spect | DASHBOARD Tom Daniëls TD

## DEFECT ANALYSIS

Zone Structure    STS crane CK001 >







- 1. Water side sill beam / sill beam
  - └ Sill beam with legs centered
  - └ Sill beam with legs cantilevered
  - └ Bolt connection
  - └ Welding condition beam
  - └ Welding condition beam
- 2. Lowerleg
- 3. Portal beam
- 4. Upper Leg
- 5. Lower diagonal
- 6. Forestay
- 7. Trolley Girder
- 8. Boom
- 9. Boom end tie
- 10. Upper diagonal

DEFECT 16.2 SUBZONE



DEFECT COMPARISON

2022    CK001

 10/09/2022	 10/09/2022	 10/09/2022
 10/09/2022	 10/09/2022	 10/09/2022

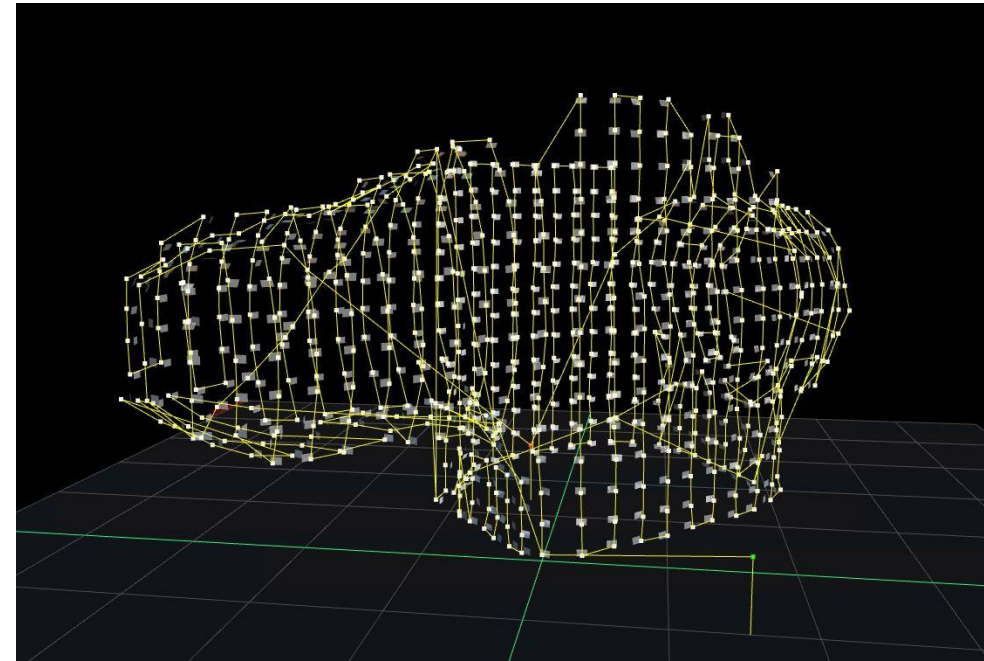
DEFECT TYPE:    **FLAKING CONCRETE**    CORROSION

DEFECT INCREASE:    **30%**    50%

[CREATE ACTION](#)

# (Semi) - automatische data collectie

Kortere vluchttijden voor kortere operationele impact




# Asset inspectie platform





Een centrale plaats voor alle inspectie data per asset

I-Spect Dashboard JE Jean-Louis Weemaes

**ASSETS** [view all assets →](#)



Map showing asset locations across Europe. A red circle highlights an asset location in Belgium. The map includes labels for various countries and cities.

Name ↑↓	Address ↑↓	Categories ↑↓
 Paceco Crane 1 inspection	Missouriweg 17 Maasvlakte-Rotterdam NL	STS_HARBOUR_CRANE
 Tank B110-3 1 inspection	Haven 1992, Ketenislaan 2 Beveren BE	TANK STORAGE_TANK
 QC08 1 inspection	Malta Freeport Birzebbuga MT	STS_HARBOUR_CRANE
 CK001 2 inspections	Sint-Antoniusweg Doel BE	STS_HARBOUR_CRANE

**INSPECTIONS** [view all inspections →](#)

	Date ↑↓	Status ↑↓
Inspection Paceco Crane	07-06-2022	Closed
Inspection QC08 STS Crane	22-05-2023	Closed
CK001 Kalmar inspection 2020	14-12-2020	Closed
CK001 Kalmar inspection 2021	14-12-2021	Closed
Inspection report Lanxess Tank B110-3	17-02-2023	Review

**ACTIONS**

Description	Customer ↑↓	Location ↑↓	Priority ↑↓
Op te volgen	Kramer	Paceco Crane Boom tie landside	●●●○
Op te volgen	Kramer	Paceco Crane Boom tie landside	●●●○
Op te volgen	Kramer	Paceco Crane Boom tie waterside	●●●○
Op te volgen	Kramer	Paceco Crane Back beam	●●●○
Op te volgen	Kramer	Paceco Crane Back beam	●●●○
Op te volgen	Kramer	Paceco Crane Machinery house	●●●○



# AI ondersteunde rapportage

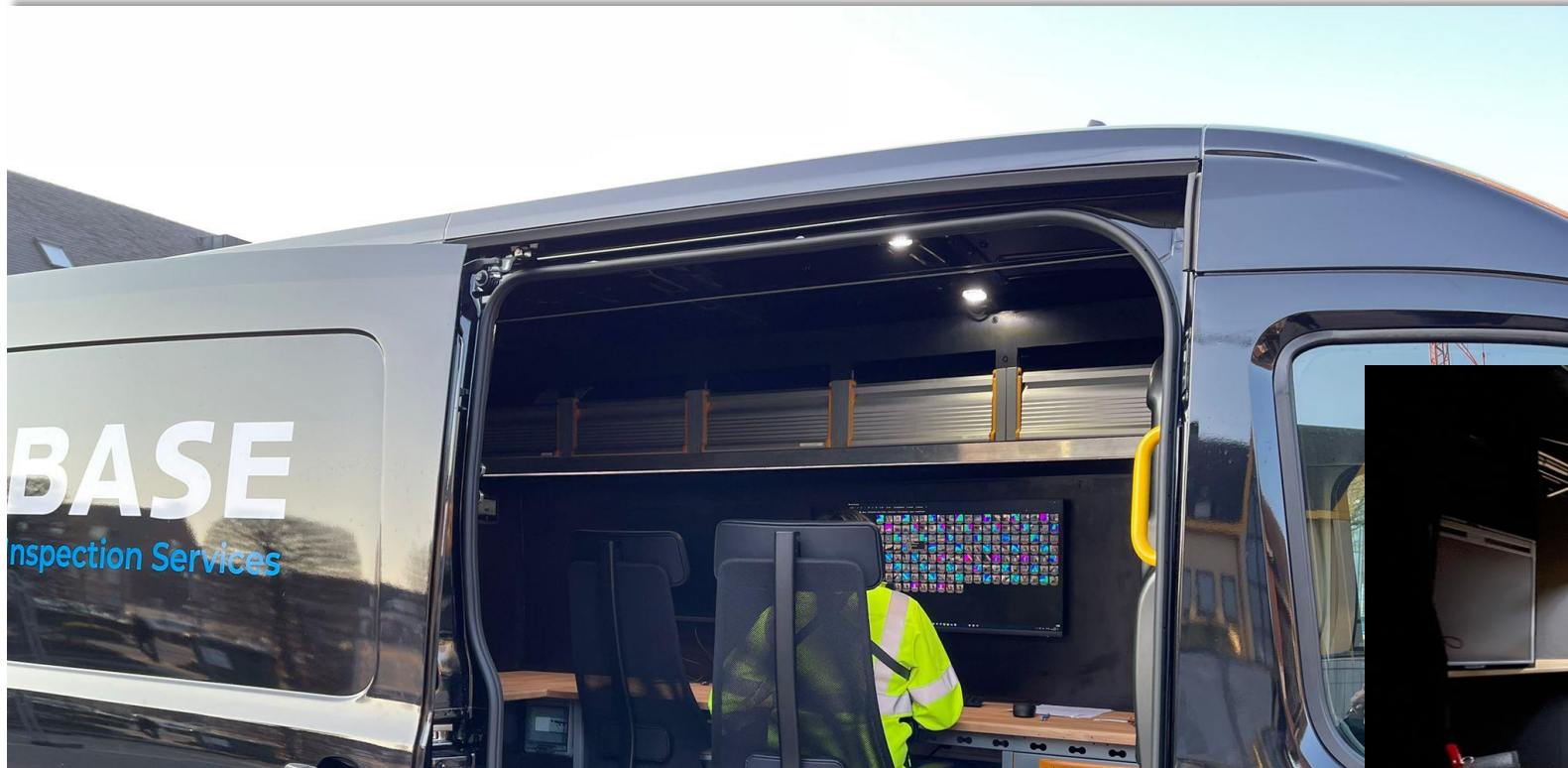
## Verwerken van defect beelden op het I-Spect platform

The screenshot shows the I-Spect platform interface. At the top, there is a navigation bar with 'I-Spect' logo, 'Inspections', 'Assets', and 'Equipment' tabs, and a 'Test' status indicator. The user profile 'ruben.vanhoorickx@skybase.be' is visible in the top right. The main interface is divided into several sections:

- Left Sidebar:** A vertical menu with icons for 'Draft', 'Planning', 'Execution', 'Reporting' (highlighted in blue), 'Review', and 'Closed'.
- Asset Structure:** A list of asset categories with radio buttons. 'Dakplan 225°' is selected and highlighted in orange. Other categories include 'L-ijzers', 'Langsprofielen', 'Plaat midden dak', 'Bevestiging langsprofiel op wand', 'Bodem tank', 'Dakplan 180°', 'Dakplan 240°', 'Dakplan 290°', 'Dakplan 320°', and 'Dakplan 340°'.
- Defect Entry Form:** A central area with a '+ add new defect' button. It contains a toolbar with icons for navigation and editing. A dropdown menu 'Select AI model' is present. Below it is a large image placeholder with a camera icon. At the bottom of this section is a dashed box with an upload icon and the text 'Drag and drop files here to upload them or click to browse.'
- Right Panel:** Contains a 'Rating' dropdown menu set to 'LOW' and a 'Comment' text area.
- Bottom Right:** Two buttons: 'SAVE DEFECT' and 'FINISH REPORT'.

# Demo

## Live verwerking van corrosie inspectie met AI





Dank voor jullie aandacht





# Contact



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