

VISY

# ARTIFICIAL INTELLIGENCE FOR INTERNATIONAL PORTS

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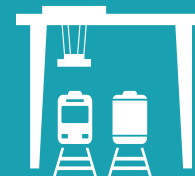
AUTOMATED ACCESS AND AREA CONTROL

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# VISY BUSINESS SECTORS



**PORTS AND  
TERMINALS**



**RAIL AND INTERMODAL  
TERMINALS**



**INDUSTRY  
AND LOGISTICS**



**AUTHORITIES**





## EXAMPLE PICTURE



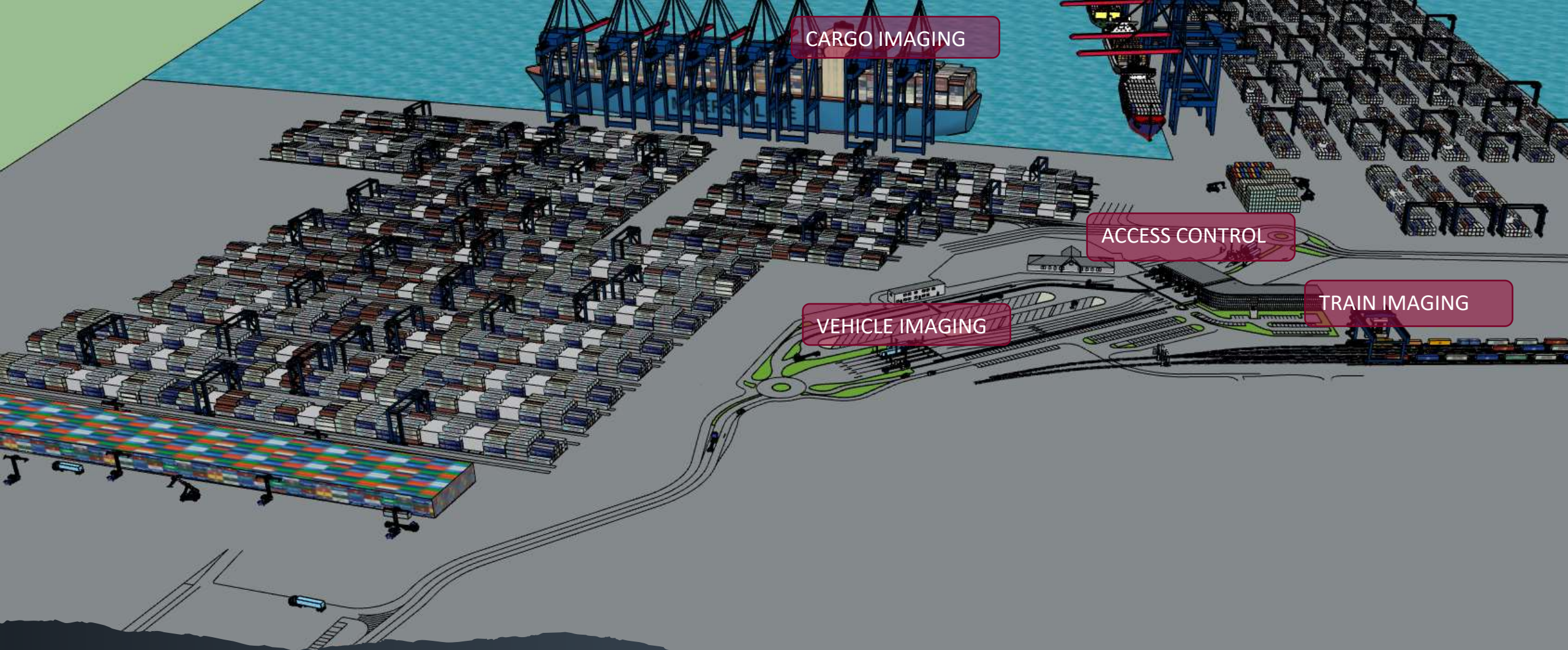


## EXAMPLE PICTURE



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CARGO IMAGING

ACCESS CONTROL

VEHICLE IMAGING

TRAIN IMAGING

# VISY OFFERING

Ports and Terminals





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# DEEP LEARNING



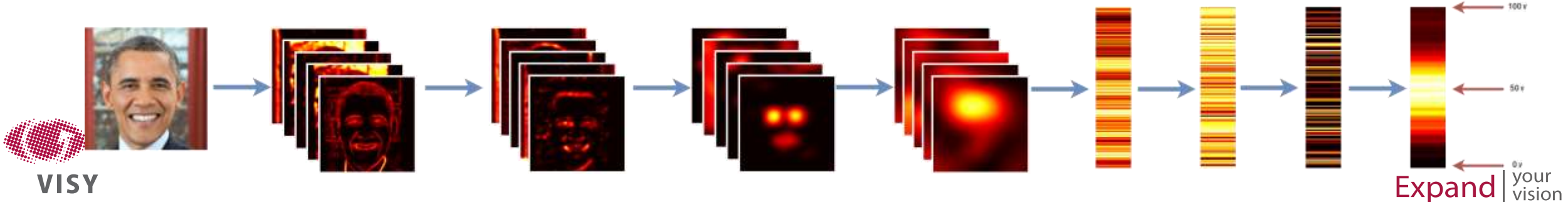
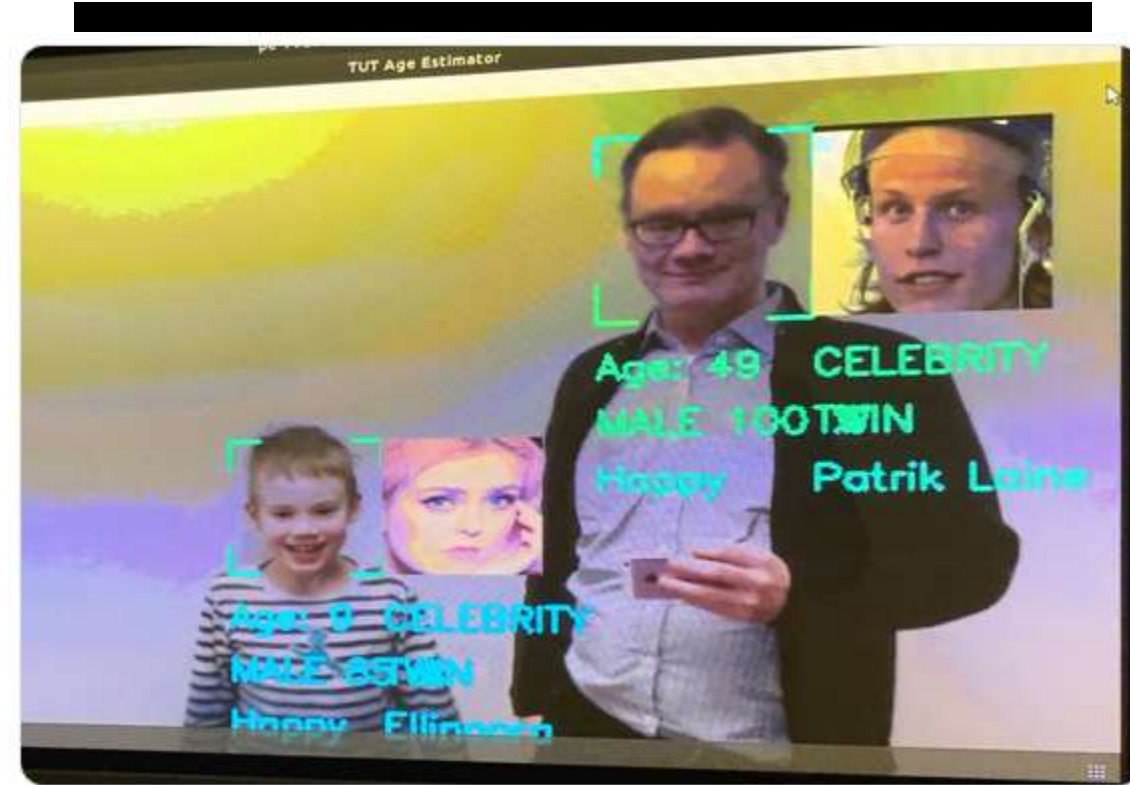
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# DEEP LEARNING

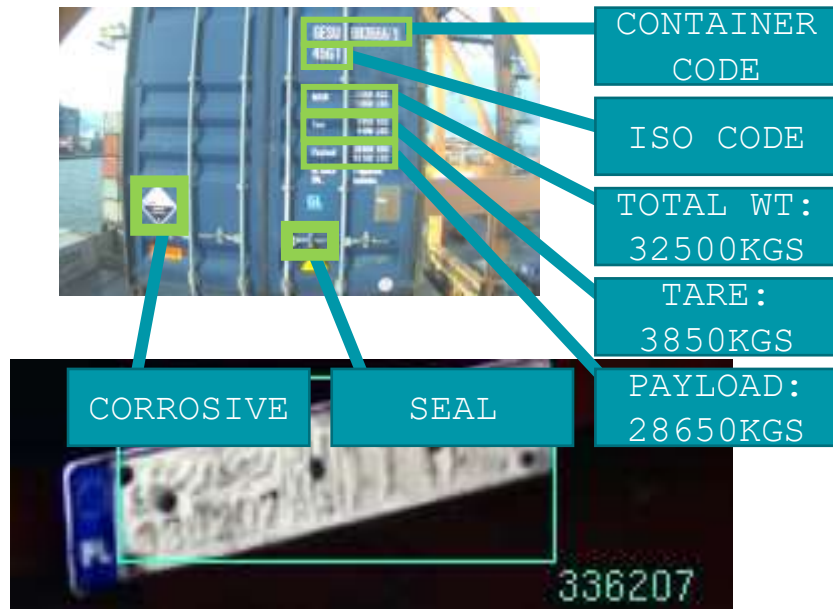
- Example: age estimation is easy for human, but challenging for a machine.
- Two stages:
  - **Detect:** Find all faces in the image
  - **Classify:** Classify the crop to one of 101 classes
- Trained using a database of 500K age-annotated images



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# VISY DNN ENGINE



- Visy's end-to-end DNN is used for several tasks
  - License plate
  - Container code
  - ISO code
  - IMO dangerous goods label
  - Seal
  - ADR label
  - Wagon number
  - Wagon length
  - Terminal tractor ID
  - Container weight
  - Damage detection
  - Door orientation
  - ...and more



# OCR HIT RATES

- We use modern AI throughout our product portfolio—reaching market leading accuracies

GATE OCR	Hit Rate
License plate	99.5 %
Container code	99.5 %
ISO code	98 %
Seal presence	95 %
Weight / Tare	97 %
IMDG / ADR	97 %
Door direction	100 %

CRANE OCR	Hit Rate
Container code	99 %
ISO code	98 %
Seal presence	95 %
Weight / Tare	97 %
IMDG	97 %
Door direction	100 %
Tractor ID	99 %

RAIL OCR	Hit Rate
Wagon Number	98 %
Container code	98 %
ISO code	98 %
IMDG	94 %

**1997:** First  
Visy OCR  
delivery

**2012-2013:** First  
academic tools  
started to emerge

**2015:** In house DNN  
recognition engine

**2017-2019:**  
Platform  
convergence

**2011:** Deep learning  
started in academia

**2014:** First Visy  
DNN installations

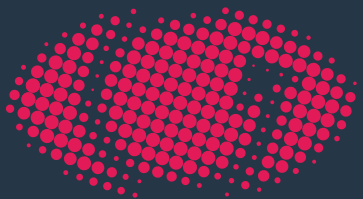
**2016:** First 3<sup>rd</sup>  
party platform

**2018:** All legacy  
models replaced



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# NEW PRODUCTS



AUTOMATED ACCESS AND AREA CONTROL



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# NEW PRODUCT: VISY TOPVIEW

- Visy TopView is a unique product with pictures taken from the STS spreader
- Picture acquired before the spreader touches the container
- Protects insurance claims and liabilities
- Very hard imaging and recognition environment – up to 60G acceleration
- Accuracy 97-98%.



Events		Queries		Archive
Event	Date	Container / ISO code	Container / ISO code	Container / ISO code
8917	30.11.2020 14:18:06	MSDU1586982 /		
8916	30.11.2020 14:16:26	TRHU2415915 /		
8915	30.11.2020 14:14:44	MSKU8981963 /		

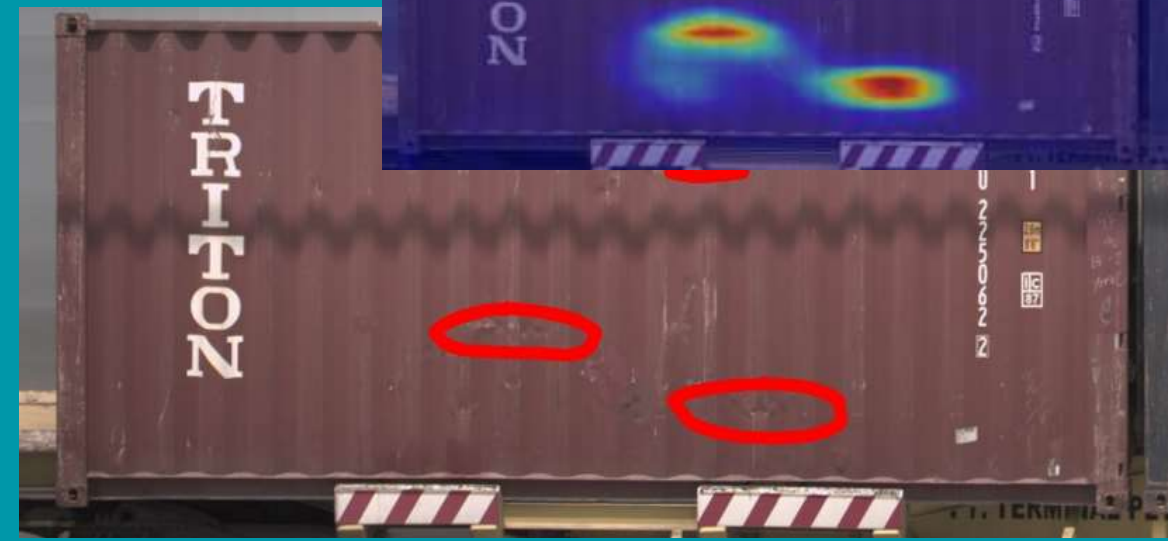
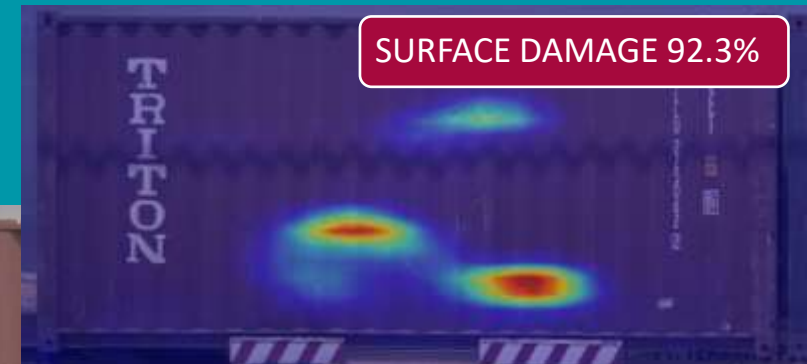


# CONTAINER DAMAGE DETECTION

Automated detection of damages in cargo containers is a central part of asset management.

Visy ADDS (Automatic Damage Detection System) is the first commercially available solution for damage detection. The system is based on modern artificial intelligence and can be tailored for the kinds of damage important for your business.

- Heatmap representation for **dents and bulges**
- Segmentation for **heavy structural damage**
- System is **Training-based**: Can be trained to new damage types

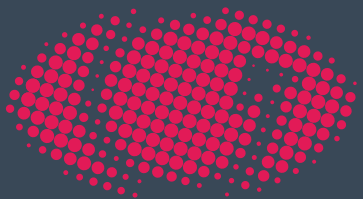


# SUMMARY

- Industrial uses of AI have expanded following the similar trend in academia earlier
- In industry, financial feasibility is what matters—what is the ROI time for the investment?
- Need to consider the system as a whole: accuracy, execution time, UX, customer process
- **AI is an investment:** requires effort in data collection, annotation, algorithm development
- Difficult to outsource—domain expertise does not transfer
- BUT: results in a unique selling point that helps in international markets







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