

How AI Is Transforming Container Inspections

Norwegian entrepreneur Theodor Preststulen (29) moved to Rotterdam to build a career in shipping. Today, his company Mavisoft is using artificial intelligence to automate container inspections, improve safety and help ports and shipping companies cut costs.



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Theodor Preststulen is the CEO and founder of Mavisoft.

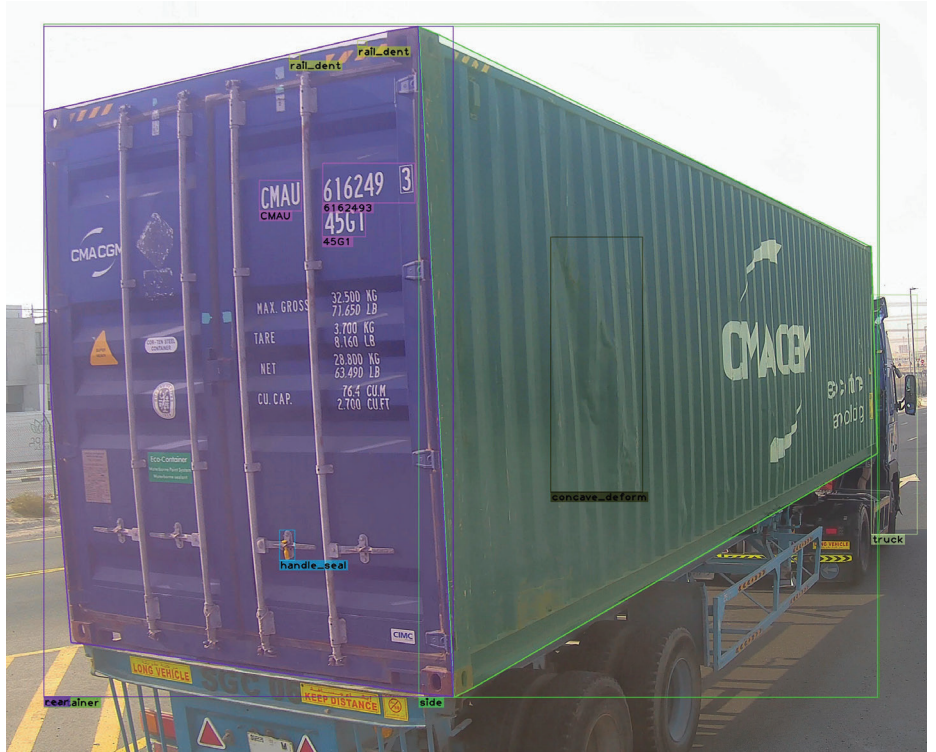
Photo: Mavisoft



Norwegian entrepreneur Theodor Preststulen never intended to start an AI company when he moved to Rotterdam, Europe's largest port, to pursue a career in shipping. Yet a combination of first-hand industry experience and advances in artificial intelligence ultimately led him to found Mavisoft, a company whose technology is helping ports, logistics operators and infrastructure owners inspect assets faster, more safely and with greater consistency.

One of Preststulen's early roles involved photographing containers and manually inspecting them for damage to determine liability before they changed hands.

"It was a repetitive and time-consuming process," he recalls. "When I later started working for AI start-ups, I discovered computer vision technology, and suddenly it became obvious that container inspections could be automated."



In a matter of seconds the ScanTair have identified the container and possible damages.

Photo: Mavisoft



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The InfraScan product can identify damages to constructions.

Photo: Mavisoft

That insight led to the launch of Mavisoft, short for Machine Vision Software, in 2018.

Its first product, ScanTainr, is an automated inspection system designed for ports and logistics terminals. Using artificial intelligence

and computer vision, it identifies container damage in real time and generates inspection reports within seconds.

It all started with MSC in Antwerp as part of a well-known accelerator program, PortXL.

Since then, the company has expanded into other sectors.

Its InfraScan platform analyses drone imagery of industrial assets and overlays inspection data onto 3D models, allowing operators to identify cracks, corrosion and other surface defects before problems become critical.

For the aviation industry, Mavisoft has developed Airport Inspector, which monitors runways and airport pavements, automatically detecting cracks and surface wear to improve operational safety.

Winning over a conservative industry

Shipping is often regarded as one of the world's more conservative industries when it comes to adopting new technology, and Preststulen says convincing customers was one of the company's biggest early challenges.

"Many people believed the inspection process was simply too complex to replicate with AI," he says. "We had to explain the technology, demonstrate what it could do and sell the vision before anyone was willing to take the first step."

Collecting sufficient training data proved equally demanding. Tens of thousands of container images were required before the algorithms became capable of recognising damage reliably.

"In the beginning, it was mainly the more visionary companies that were prepared to invest. DP World, for example, played an important role in helping us develop the solution. Today the technology has matured, and the market increasingly recognises that AI will become an integral part of the industry's future. Even so, shipping remains a cautious sector."

Although Mavisoft is headquartered in Rotterdam, only around 20 per cent of its business comes from the Netherlands.

After the war in Iran business in that region slowed down. Investment in new technology is usually the first thing to pause in that kind of uncertainty.

Mavisoft now focuses more on the EU-market and even venturing to Australia.

Keeping data on-site

As AI adoption grows, cybersecurity has become a key concern for customers.

According to Preststulen, many shipping companies are now moving away from cloud-based solutions in favour of keeping operational data within their own networks.

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"There was a period when everyone wanted everything in the cloud," he says. "Now we're seeing the opposite. Customers increasingly want their data stored on their own servers."

For that reason, ScanTainr is typically installed entirely on-site.

"It would certainly be easier for us to manage everything remotely," Preststulen says. "But once the system is installed locally, it's significantly more secure. The customer owns all the data."

Faster and more consistent

How does an AI inspection compare with a human inspector?

According to Preststulen, consistency is one of the technology's greatest strengths.

"The system doesn't get tired, distracted or have good and bad days. It evaluates every container using exactly the same criteria."

Training the AI to perform reliably under different environmental conditions was one of the company's biggest technical hurdles.

"Changing weather, lighting conditions, rain and bright sunlight

all affect image recognition. It took considerable effort to build models that performed consistently regardless of where they were deployed."

Each new installation still requires additional optimisation.

"A model trained in the Middle East experiences very different lighting conditions from one operating in Northern Europe. Here you have rain, snow and completely different colours and shadows, so we fine-tune every deployment to local conditions."

Five seconds from scan to report

ScanTainr itself is relatively straightforward in concept.

Containers are driven through an inspection portal measuring approximately eight metres wide and seven metres high. Six high-resolution cameras capture every side of the container while it passes through at speeds of 15–20 km/h.

The images are analysed immediately by an on-site server, and a complete inspection report is delivered in around five seconds.

The AI currently recognises around 20 different categories of damage,

identifies their location and recommends the appropriate repair action. Inspections can be carried out both when containers arrive at a terminal and before they leave, allowing operators to compare their condition throughout the handling process.

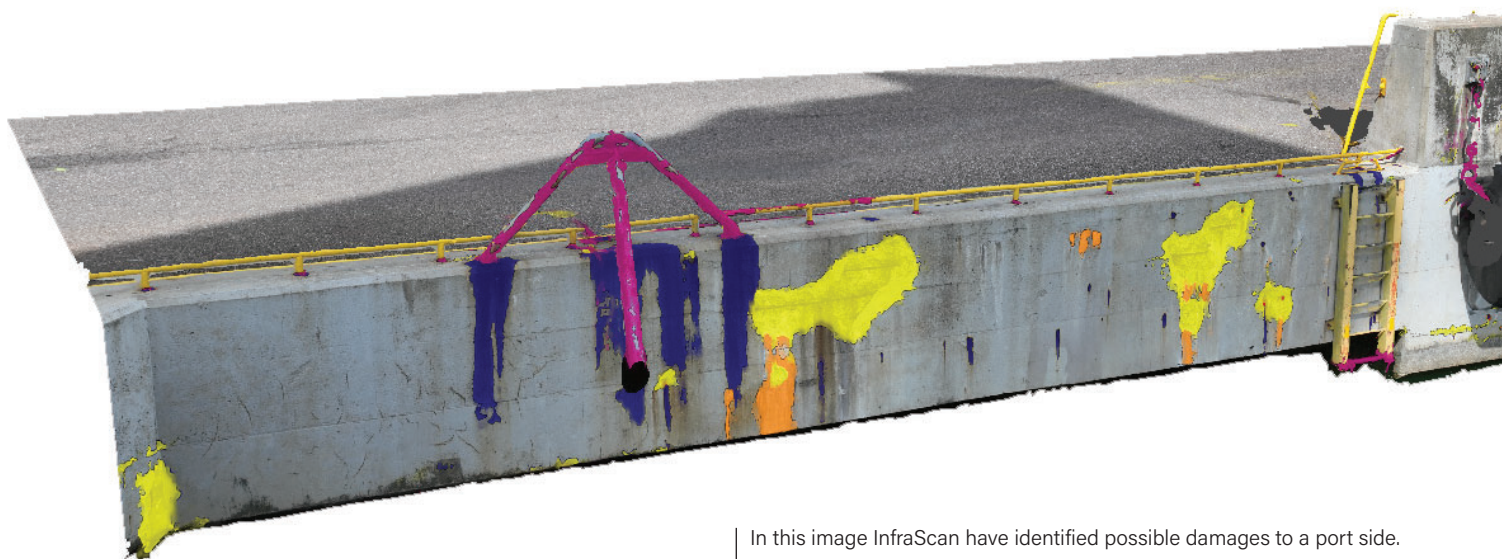
Reducing delays rather than replacing people

While automation often raises concerns about job losses, Preststulen believes AI should be viewed as a productivity tool rather than a replacement for skilled workers.

"We see container depots where long queues develop simply because inspections take too long," he says. "A manual inspection typically takes around five minutes, and everything has to be documented by hand."

With ScanTainr, the inspection is completed almost instantly, allowing personnel to focus on repairs and higher-value tasks instead of routine documentation.

"Containers are expensive assets," Preststulen says. "Every hour they sit idle waiting for inspection costs money. If we can reduce that downtime while improving consistency and safety, everybody benefits."



In this image InfraScan have identified possible damages to a port side.
Photo: Mavisoft

Beyond containers

While ScanTair is currently focused on container inspections, Preststulen says the underlying technology can be applied far more widely.

"Absolutely," he says when asked whether the same system could be used to inspect ships in dry dock. "That's not a problem at all."

Mavisoft already develops digital twins and 3D models for industrial assets, capabilities that extend well beyond the maritime sector.

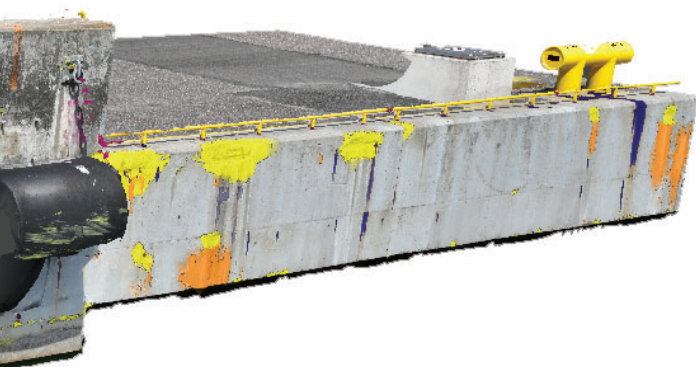
"We're also inspecting airports. At Schiphol Airport, for example, we capture images across the entire airfield, analysing the concrete and asphalt surfaces for cracks, spalling and other defects."

The AI models are trained to identify different types of deterioration before classifying each defect according to its severity.

"The findings are processed through a decision framework. If damage exceeds predefined thresholds, it's automatically flagged for attention. Because every inspection is recorded, operators can also monitor how an asset deteriorates over time."

For Preststulen, that points towards the company's long-term vision.

"Whether it's containers, ships, airports or other critical infrastructure, the principle is the same. We use computer vision and AI to give owners better information, improve safety and make maintenance decisions based on data rather than manual inspections."



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