

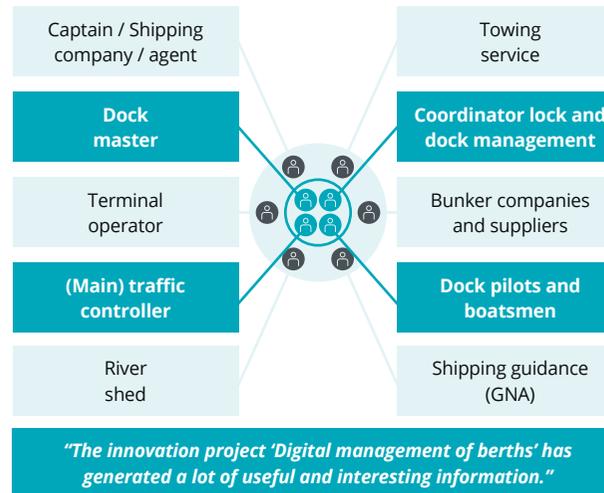
Port of Antwerp increasing dock utilisation

Current situation

Berth allocation is crucial for efficient terminal utilisation in container ports such as Port of Antwerp. Preparing an efficient planning of berth allocation is not an easy task to fulfil for the port authority. A lot of things have to be taken into account, such as the number of free anchoring places available and the planning of the seagoing vessels and barges. Detailed and real-time insight into this information offers opportunities for optimizing berth utilisation, reducing transshipment time, maximizing crane usage and efficiently transporting and storing containers.

	Need for decisions based on factual information coming from technological solutions.
Improved decision making	Reduce errors by creating automatic transmission of information.
	The current manual process is time-consuming for dock masters. The solution will reduce the need for manual registration and on-site presence.
Changing roles	
	Reduce time to register arrival and departure of vessels.
Improved accuracy & efficiency	Improve accuracy of vessel location registration.
	Increase the satisfaction of the ship companies and captains in terms of berthing order and throughput time.
Customer satisfaction	

Stakeholders



Feasibility

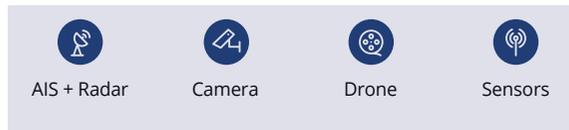
Quay standardisation

Various factors are important in standardising quays, such as the different types of quays and ships, the impact of a number of environmental factors and the infrastructure.



Possible technologies

A variety of possible technologies has been evaluated and proposed and evaluated.



Solution

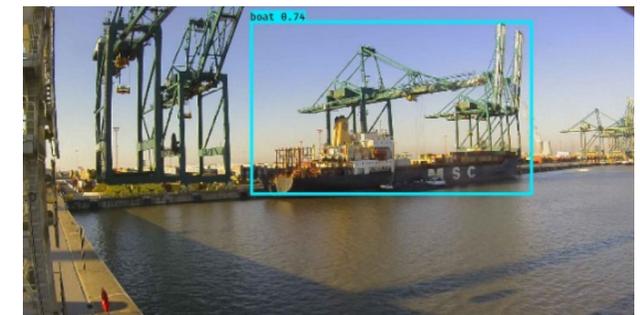
The current berths can be used more efficiently by a detailed and real-time follow-up of their use. By means of automatic and digital capturing, this information can be made available to different parties more quickly.

Business Challenge

"To optimize the flow of vessels and improve the utilization of the docks, we need to know what parts of our docks are occupied"

Technical Challenge

"Computer Vision for Boat Detection: Use image processing from camera feeds to detect vessels and their exact location"



Object detection

Training a Neural network Yolo v2 based on labeled images.

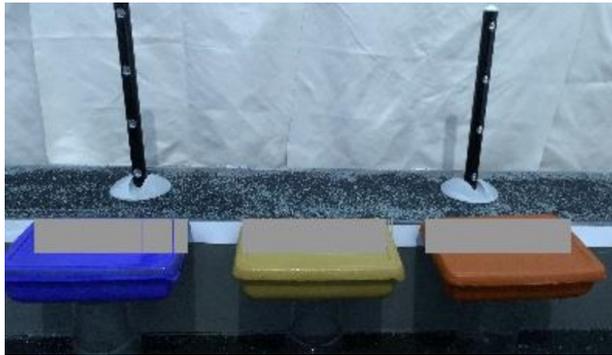


Spectrum vzw offers professional services to adults with intellectual limitations. Their team supported our effort by labelling over **10.000 boats** to train the convolutional neural network

"This project was a new experience for Spectrum and our people. Being able to contribute value to an external company provided additional motivation."

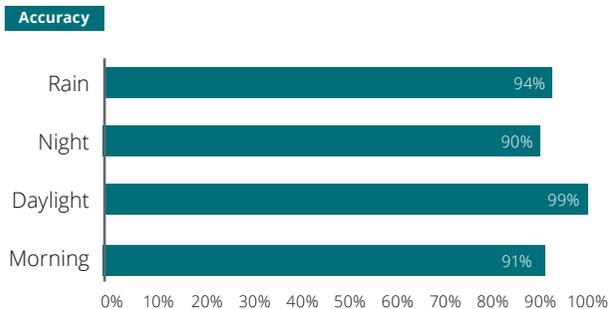


Through object recognition we can detect vessel locations. However, with this technique only, it is not possible to map the available landing stages in the dock to less than 1 meter accuracy. The placement of a strip along the quay makes this accuracy possible.



Reflective stripsimulation

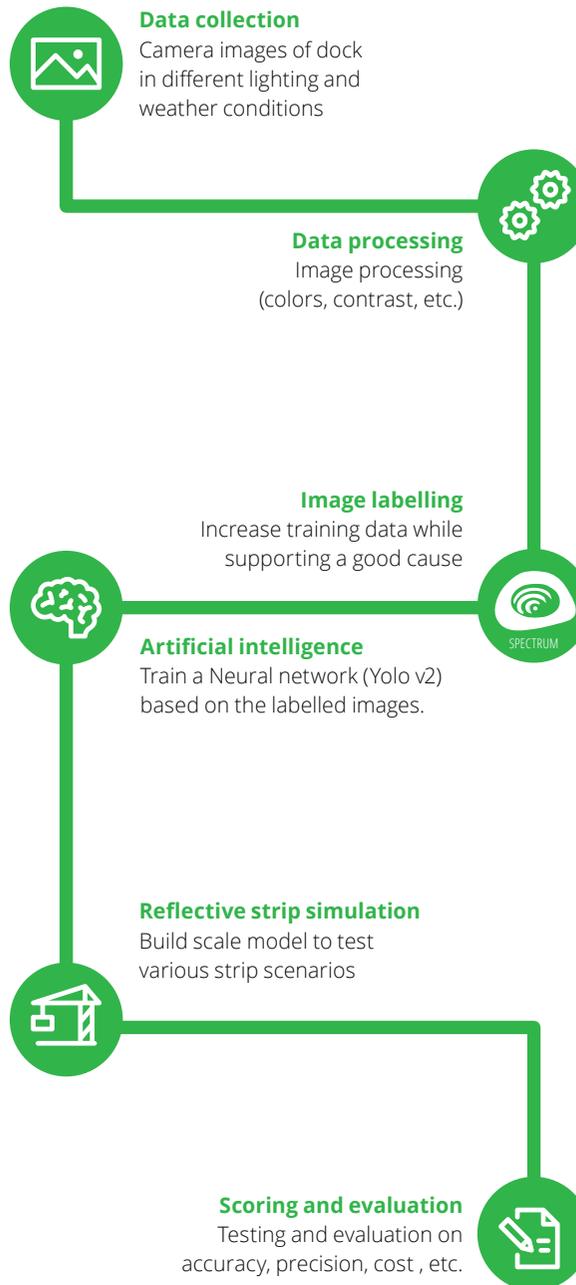
Apply a strip on the quay to increase the accuracy



Conclusion

A combination of both techniques, object detection on camera images in combination with a reflective strip, generates the necessary accuracy and best results.

Image recognition process



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