ONEBONSAI

CASE STUDY

VR Mooring Training for the Port of Antwerp

VR mooring safety training for dock workers in the Port of Antwerp: a digital twin of the harbour shows what happens when a mooring line snaps.

Platform: VR / Location: Port of Antwerp / Hardware: Mobile VR headsets / Format: Digital twin of the harbour, branching scenarios



Project overview

VR mooring safety training for dock workers in the Port of Antwerp: a digital twin of the harbour shows what happens when a mooring line snaps.

About the project

OneBonsai built VR mooring safety training for dock workers in the Port of Antwerp. On mobile VR headsets, workers run the full mooring procedure in a digital twin of the harbour, built with harbour experts, and see what happens when someone stands in the path of a line under tension, without any real danger.

Challenge

Enhancing Mooring Safety Training

Dock workers in the Port of Antwerp are responsible for securing some of the largest vessels in the world.

Mooring is a high-risk operation where errors can have life-threatening consequences. A snapped mooring cable, for example, can cause severe injuries or fatalities. Traditional training methods relied heavily on classroom sessions, manuals, or e-learning modules that outlined safety protocols but lacked the realism needed to truly convey the dangers of the job. Workers often found the training disengaging, and retention of safety-critical details was low.

Without immersive, hands-on practice, it was difficult for staff to fully grasp the risks or build confidence in performing procedures correctly. The port needed a training solution that could bring realism into mooring safety education while remaining safe, scalable, and repeatable.

> *"Existing e-learning didn't convey the life-threatening danger of snapping cables, workers needed to really feel the risk."*

Solution

Immersive VR Training for Real-World Safety

OneBonsai developed a VR-based training module that recreates the mooring environment through a detailed digital twin of the harbor setting. Using VR headsets, dock workers can step into a lifelike simulation where they practice securing vessels, handling mooring lines, and maintaining safe positioning.

The training highlights the risks of incorrect behavior, for example, standing in the path of a cable under tension, by showing realistic consequences within the simulation. By immersing workers in these scenarios without putting them in actual danger, the VR training provides a powerful and memorable learning experience.

Approach

Crafting a Realistic Training Experience

The VR module was built in collaboration with harbor experts to ensure that every step of the mooring process was accurately represented. Interactive tasks were integrated to keep workers actively engaged, while branching scenarios demonstrated both correct and incorrect choices.

The system was designed for mobile VR headsets, making it portable and easy to deploy directly at the docks or in training centers. The focus was on creating a tool that workers could use repeatedly to build muscle memory and hazard awareness, reinforcing correct behavior in a way that static lessons could never achieve. This approach ensured the training was not only educational but also deeply engaging and directly applicable to daily operations.

> *"I'll never forget the moment I saw what happens when a cable snaps in VR, it really drives home the danger."*

Outcome

Safer and More Confident Dock Workers

The VR Mooring Safety Training program significantly improved hazard recognition and procedural compliance among dock workers. Participants reported a stronger understanding of the risks associated with mooring and felt more confident applying safety protocols on the job. Managers noted higher engagement and better retention of training content compared to traditional methods.

By turning dangerous scenarios into safe, repeatable exercises, the VR solution helped reduce accidents, strengthen safety culture, and prepare workers more effectively for one of the most dangerous tasks in maritime operations. The program demonstrated how immersive training can transform high-risk industries, combining realism with safety to protect workers and operations alike.

> *"This training reduces accidents and gives our teams the confidence they need on the docks."*

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