Serious VR Game

THALES

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Introduction

- VR Training Simulation
- Naval Vessel setting
- Who is Thales

HOLLAND CLASS PATROL VESSEL 375

Problems & Goals

Problems:

- Thales wants to see if it's possible to train mechanics in a VR simulation.
  - only 4 ships
  - expensive to train on ship

Goal:

- To deliver a serious game, meeting as many requirements set by Thales.

Goals

Initial Goals

- VR serious game for trainees
- Create a realistic environment
- See arm/hands in VR
- Fully visible instructor
- Change difficulty
- Scoring system
- Integration of 360 degrees video
- Code that can be easily applied
- Multiplayer mode

Goals

Final goals

- Create a realistic environment
- VR serious game for trainees
- See arm/hands in VR
- Code that can be easily applied

Added goals

- Develop a GUI for VR
- Visualize children of objects

Method description and approach

Organization

- Meeting client every 2 weeks
- Visit to navy in Den Helder

- Scrum
- Trello
- Google drive
- A bit of ‘’on the go’’ planning

Method description and approach

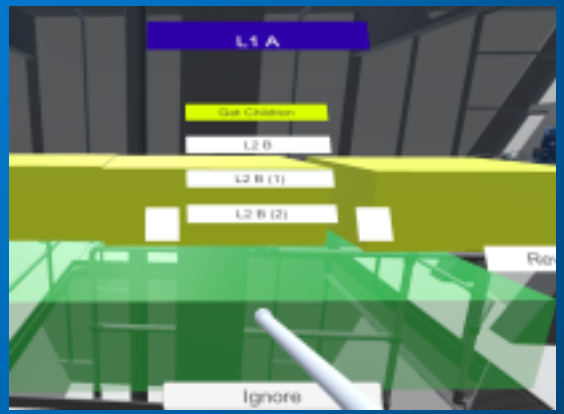
Programming

Inexperience at the start

Learning methods:

- 1st year programming course
- Tutorial courses
- Investigated the VR Toolkit
- Hands on guidance from teachers

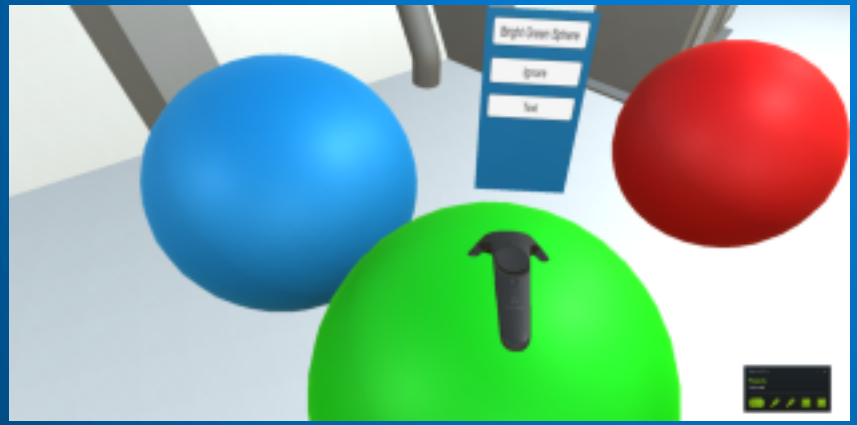
Increased our skills in order to achieve goals



Programming

Testing User Experience

Iterative Process



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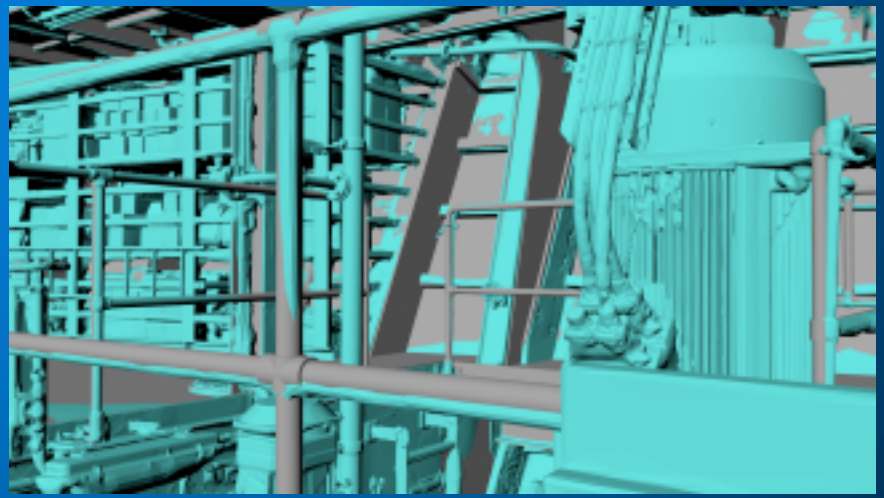
Bow Thruster Room

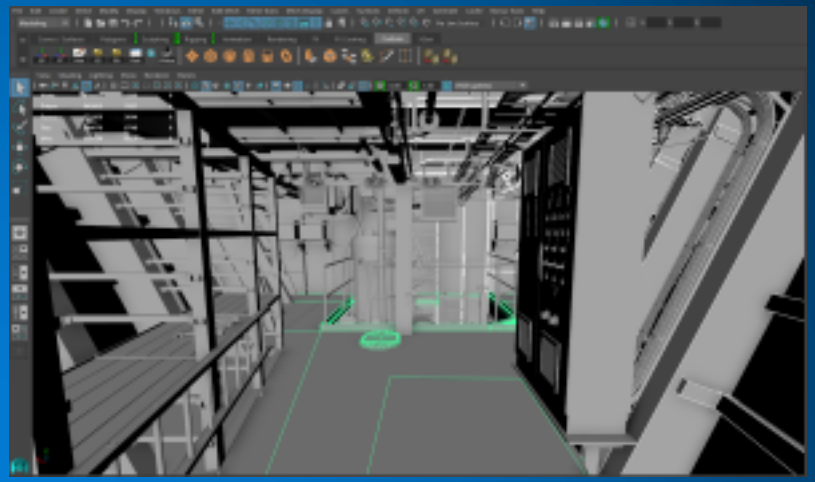
Creatives

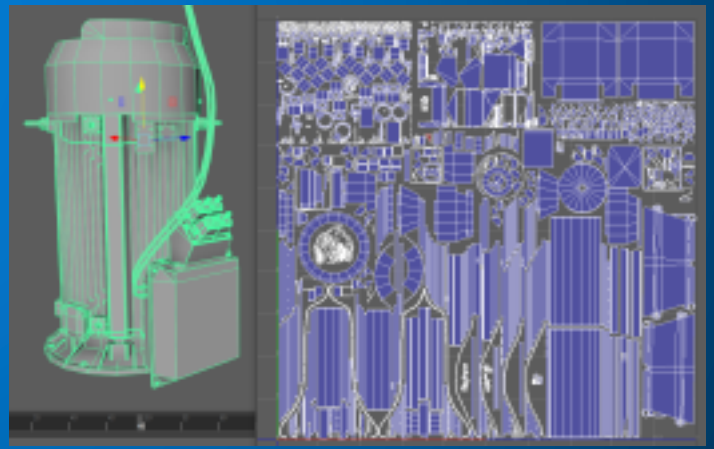
- Photos
- Point Cloud 3D scan
- Re-meshed in ZBrush
- Used to accurately scale objects with relation to others
- 360 degrees images



3D Modelling

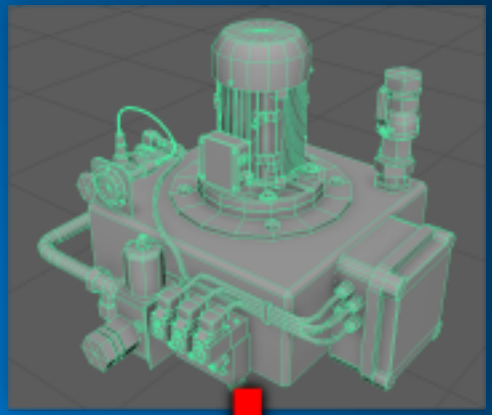
- Autodesk Maya for modelling
- UV-mapping
- Texturing
- 3D Hands

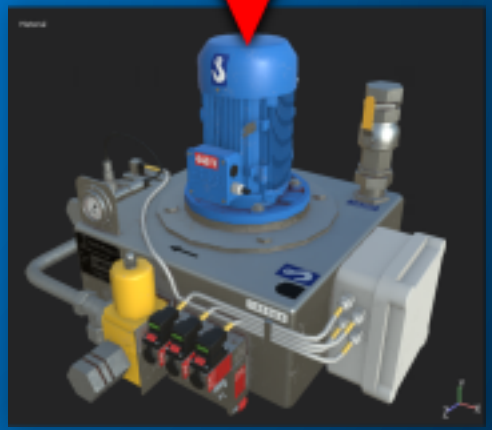




Asset Creation

- Texturing
  - Substance Painter for quality and speed
  - Photoshop for specific jobs
  - Generators for dirt
  - Unity roughness remap (instead of alpha channel)
  - XNormal
  - ZBrush

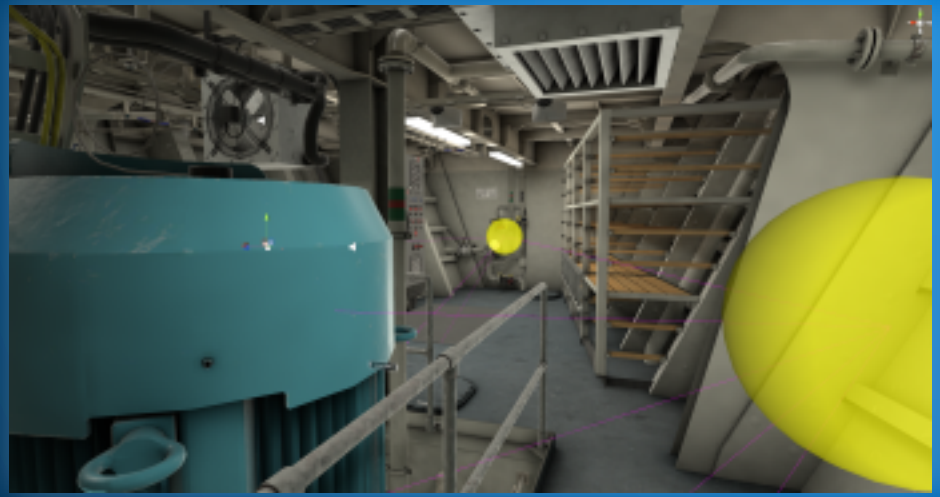




Before | After | Ingame

Lighting

- Baked emissive strips for quality & realism
  - Only Progressive worked
  - Final bake took ~4 hours
- Used Light Probes to dynamically light moving objects
- Used reflection probes for better ambient light



Results & Reflection

Results:

- High quality 3D room, interactive elements
- Positive feedback from client
- Fulfilled basic requirements set by Thales

Conclusion & Recommendations

Conclusion:

- In conclusion we delivered a higher quality product than we first expected, but we also had to discard some goals to complete the project
- We greatly increased our skills in both asset creating and programming
- Our scene will probably be used in the future by the marine to convince their board or other armies to invest in this technology

What we are proud of

- Working with Virtual Reality & the HTC Vive
- Creating a meaningful product that is going to be used
- Working with the client Thales
- Working in a multinational team with interdisciplinary skills
- The created 3D assets
- Programming progress & created scripts in the last few weeks

Questions?

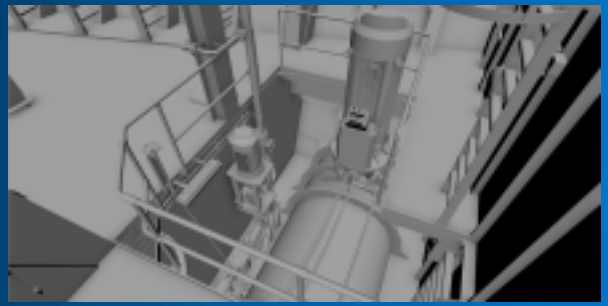
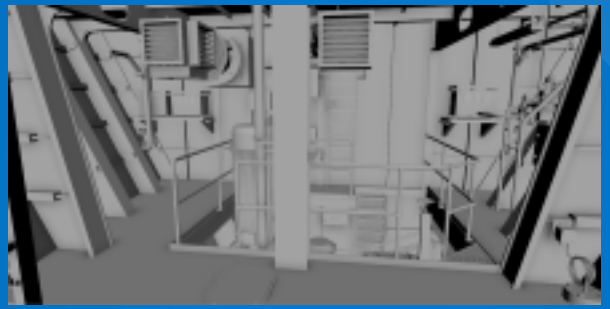
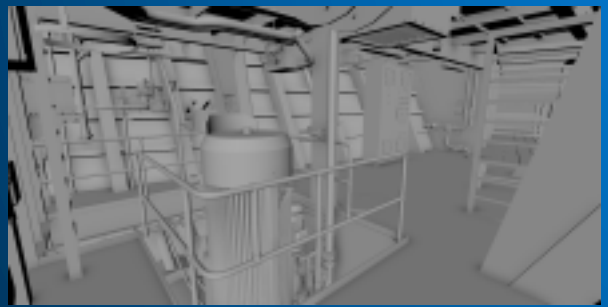
Background Theory

Vessel facts

Specifications:	Type of missions:	Weapons:
Length: 108.4m	Naval patrols	1 x NH90 helicopter
power: 14.500 hp	Law enforcement	2 x RHIB, approx 12 m
Speed: 22 kts	Search and Rescue	1 x Fast rescue boat
Crew: 50	Smuggler interception	1 x 76 mm gun
Fuel: 508 m3	Humanitarian relief	1 x 20-30 mm gun
Max days at sea: 21	Interdiction	2 (+2) machine-guns

Current state of the project

- Programming
  - Hover Menu
  - Display Object ID’s / Names
  - Go down and up in Hierarchy of Components
  - Grabbing & Releasing Objects
  - Teleporting
- Asset Creation
  - Modelling and Texturing
  - Waiting for the 3D scan

Bow Thruster Room

3D Assets