National Institute of Technology (KOSEN),Toba College

VRTP

Development of VR Training Methods Using Photogrammetry for Chemical Plant Operation

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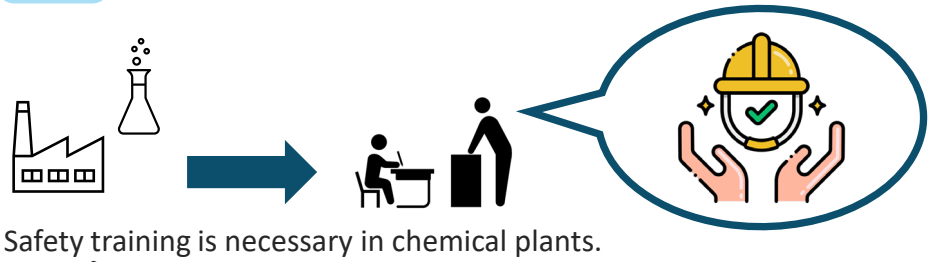
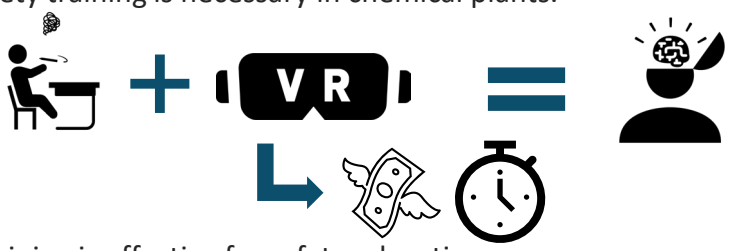
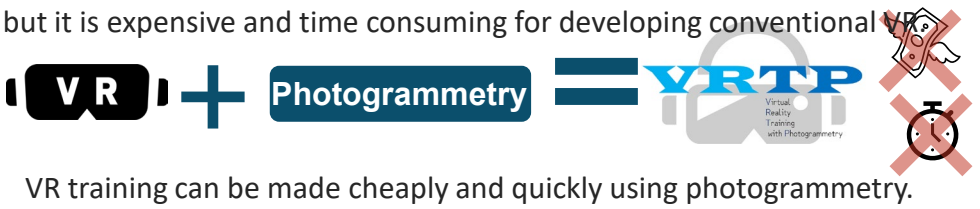
01 PLOBLEM



Safety training is necessary in chemical plants.



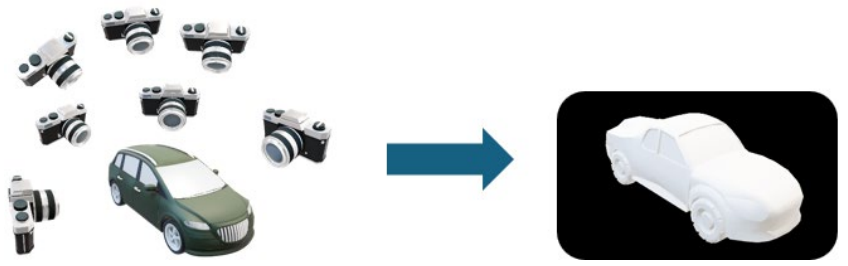
VR training is effective for safety education,
but it is expensive and time consuming for developing conventional VR.



VR training can be made cheaply and quickly using photogrammetry.

Photogrammetry

It is a method of photographing a subject from various angles, analyzing and integrating the digital images to create a three-dimensional 3D model.



02 FRAMEWORK

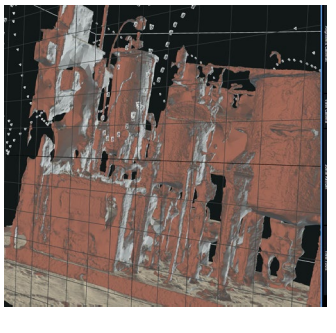
1 Shooting

Photograph the chemical plant from all directions (360° direction)
In order to get hight quality image, video recording with a smartphone is preferred.

2 3D model generation

RealityCapture

- FREE
- for Photogrammetry

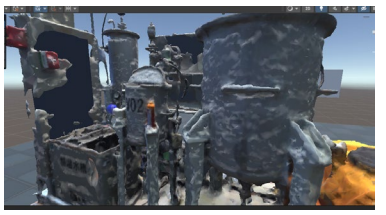


Use the software Reality Capture.
It imports videos and creates 3D models.

3 Creation of VR content

Unity

- FREE
- for game developer



Import the 3D model into Unity.
At this stage, create buttons and valves to move in VR.

4 Release

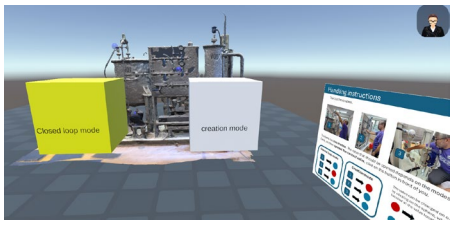
cluster

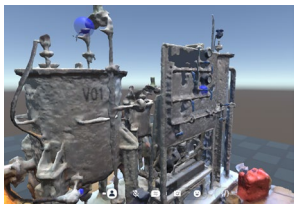
- FREE
- for metaverse

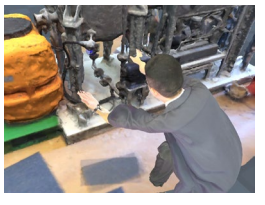
The service called “cluster” will be used to release the world to Web.
The metaverse makes it easy to create a training environment.

03 FINDING

The chemical plant has two operation modes which depends on the valve position.



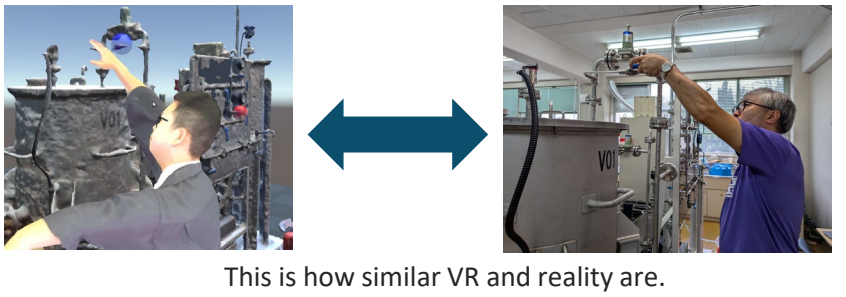




If you open the wrong valve

It burns.

Multiple teachers and trainees can participate.
In the metaverse, plant operations can be instructed .



This is how similar VR and reality are.

04 INTERPRETATION AND CONCLUSION

VRTP is a method of creating VR content using photogrammetry.
The scope of VRTP ranges from filming to release on the web.
In this case, we reproduced the opening and closing of a valve in metaverse, which is the basic operation of a plant. It was faster and easier to create than the conventional method using 3DCG models.