

INDUSTRIAL EQUIPMENT TRAINING AND SAFETY

Beacon Application Description:

The BA3 will provide a machine-learning methodology based on synthetic datasets from VR industrial environment that can be used for human training in safety procedures and proper machinery handling. The specific application will create synthetic data sets using virtual models of safety equipment namely helmets, protection glasses, gloves, etc. Next, ML models will be trained to detect specific objects in actual working environments. The goal of this application is to detect dangerous situations in industry environments and prevent accidents at work either by identifying improper procedures or violations of safety rules.

Target User Groups:

- *Professionals*
- *Engineers*
- *Students*

Learning Scenario:

Safety scenario #1:

Identification of safety rules violations (ex. A worker entering the workplace without wearing a protected helmet).

Safety scenario #2:

Identification of dangerous actions (ex. A worker closely approaches machinery with moving parts)

Difficulty Level:

The application will support the trainees providing text (i.e. suggestions, error messages, etc) during the process

Interactions:

The trained ML models will be evaluated in virtual environments and in using videos/photos from actual industrial workplaces.

Enablers:

- Technologies, tools, or frameworks that the team is using to build the application, including any relevant version numbers.
 - Unity
 - Blender
 - Pytorch
 - Tensorflow
- The programming languages and databases used.
 - C#
 - Python
 - YOLOv5 (<https://github.com/ultralytics/yolov5>)

Platform

- The operating system, cloud environment, or other platform that the application is built on:
 - Windows 10/11

Work until M14:

M04: App Specifications

M07: First version

M14: Final version with documentation

Compatible Hardware Platform:

Windows 10/11 computer

GPU: TBD

Multi-User:

The app does not support multiple users.

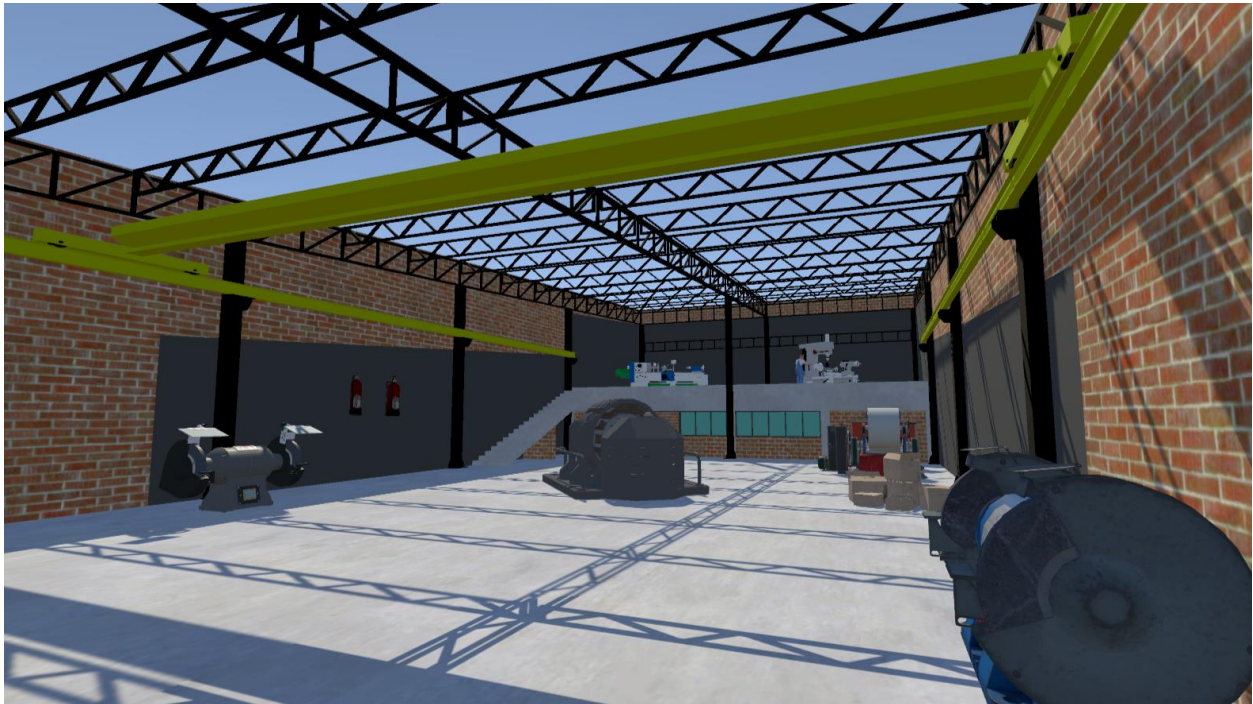
3D Engine + Version:

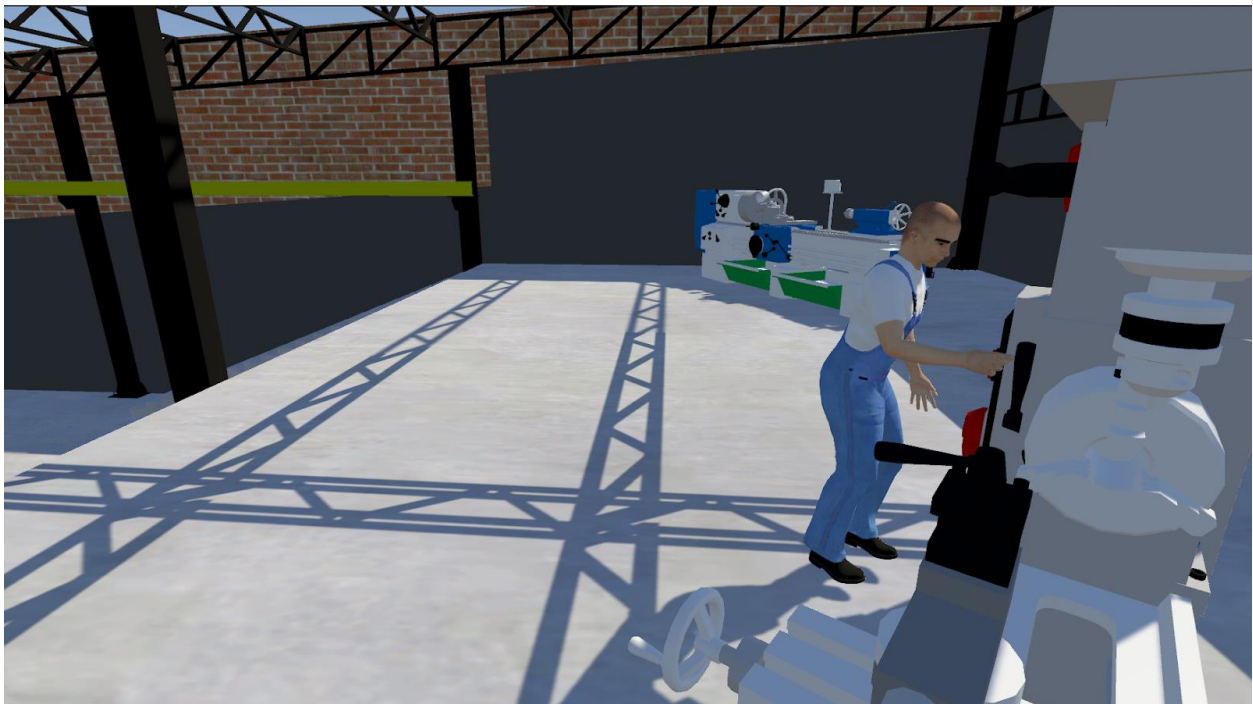
Unity 2021 LTS

Ownership of 3D Data:

Maggioli SPA

Media files:





Sample of Synthetic dataset

