Technische Hochschule
Brandenburg
University of
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and Safety

PERSPECTIVES FOR THE USE OF 3D INTERACTIVE ENVIRONMENT IN PHYSICAL PROTECTION EDUCATION AND TRAINING

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Actual challenges for Physical Protection education and training

- Distance Learning and E-Learning methods doesn't allow to practice skills

- Limited access or total restriction on utilization of operated Nuclear Facilities for training purposes

- Lack of training facilities and specialized laboratories for Physical Protection

- Relatively high costs of training abroad for developing countries without advanced nuclear program

- Confidntiality issues for successful international cooperation and knowledge transfer

Most used approaches for education and training in Physical Protection

- Lection and presentation with drawings or charts (photos less often).
- Demonstration of videos with improvised situation.
- Tabletop exercises.
- Demonstration and practice on laboratory stands.
- Demonstration and practice on special polygons.
- Technical tours on facilities.

Virtual Reality basic concepts

Immersion and presence effects:
- Non-immersive;
- Semi-immersive;
- Immersive.

Interaction with user:
- Standard input devices;
- Special controllers;
- Recognition of own hands movement.

Content:
- Self-sufficient Virtual Environment;
- Augmented reality.

Introduction

http://vips.uniss.org

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Study: 3D-based Learning Solutions(Demo)

PANORAMA using 3DStudioMax
(fixed locations, panorama view)

MiNS
Master in Nuclear Security

Video game using UNITY
(stageless player movement)

Please select your solution by clicking on the corresponding image

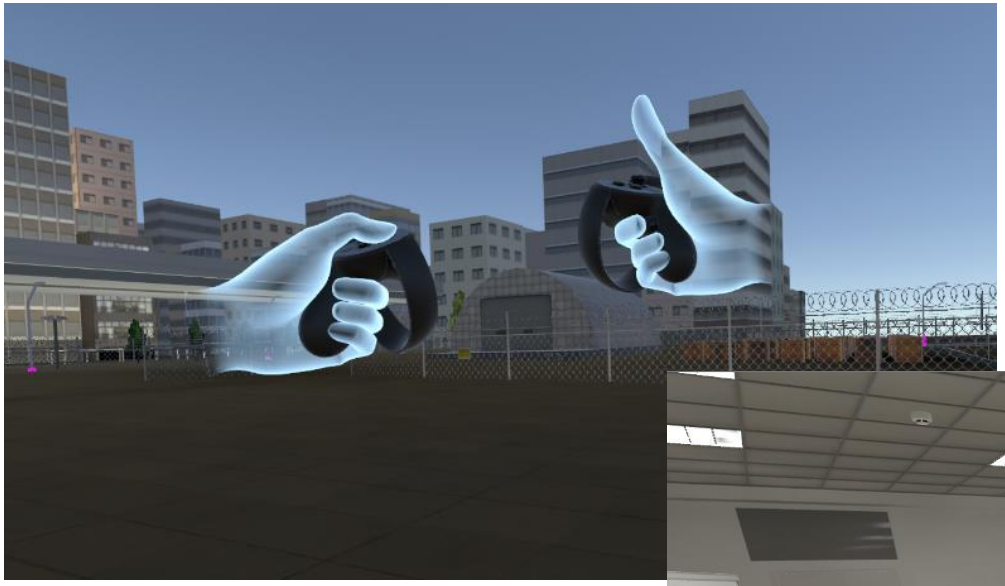
Features of Virtual Hypothetical Facility

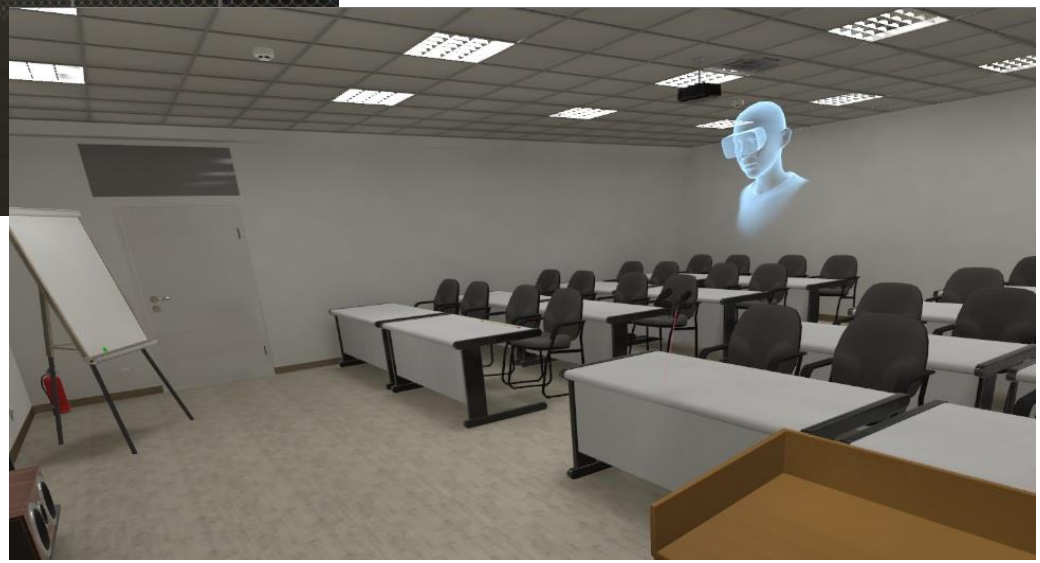
- Doesn’t exist in the reality.
- Levels of visual and technical details are defined by purpose of virtual environment.
- All interactions of user and environment are predefined and limited by used input devices.
- Possible for usage as multiplayer application
- Could be integrated in comprehensive model with additional documentation, related 3d models, cyber environments and improvised networks

Non-immersive Virtual Reality for MiNS

Non-immersive Virtual Reality for MiNS

Immersive Virtual Reality with advanced computer technologies





Immersive Virtual Reality with mobile technologies

Advantages of Virtual Reality for education and training

- High level of efficiency and consistency in obtaining new knowledges and practicing skills.
- Equal visual delivery with naturally understandable physics and dependencies.
- Not required security vetting for participants and not limited to citizenship of trainees.
- Remote and distance trainings without leaving job position.
- Flexible and fast changing environment and scenarios.
- Low per-capita costs for training with high staff turnover rate.

Challenges for Virtual Reality in education and training

- First generation of headsets still need to be improved and prices reduced.

- Costs for initial development could be relatively high.

- Methodology and instructions development for comprehensive environments could takes longer than time spent on virtual environment development.

- Is there need for security vetting?

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Thank you for your attention!

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