



HAL
open science

Training and Data Analysis use cases for Cybersecurity through Mixed Reality Applications

Alexandre Kabil, Thierry Duval, Marc-Oliver Pahl

► To cite this version:

Alexandre Kabil, Thierry Duval, Marc-Oliver Pahl. Training and Data Analysis use cases for Cybersecurity through Mixed Reality Applications. VR4Sec 2021 (Security for XR and XR for Security), Aug 2021, Virtual Event, France. hal-03402688

HAL Id: hal-03402688

<https://hal.science/hal-03402688>

Submitted on 25 Oct 2021

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Training and Data Analysis use cases for Cybersecurity through Mixed Reality Applications

Alexandre KABIL
IMT Atlantique, Rennes, France
Lab-STICC, UMR CNRS 6285

Thierry DUVAL
IMT Atlantique, Brest, France
Lab-STICC, UMR CNRS 6285

Marc-Oliver PAHL
IMT Atlantique, Rennes, France
IRISA, UMR CNRS 6074

Abstract

In this paper¹, we will discuss our point of view of the use of Mixed Environments for Cybersecurity, especially for training and data analysis purposes. We will argue that Collaborative Mixed Environments could merge training and analysis approaches by providing users several points of view on cyber situations.

1 Mixed Reality for Cybersecurity

As we have presented our position on this topic in 2018 [1], we think that Mixed Reality (MR) Environments could be used effectively for Cybersecurity domain through training and data analysis use cases (security sensitization and alert analysis for example).

In various scientific domains, Immersive Analytics is now used to offer more insights about data and situations. Serious games, simulations and Digital Twins also are now developed to train people on specific practices or to enhance their awareness to more general issues.

There exists few environments that merge training and data analysis capabilities; designing such environments requires knowledge about user's practices and skills and to our knowledge there is no framework that proposes such applications.

These kinds of environments could be very beneficial for the cybersecurity domain, as companies need both to train analysts and to give them efficient data analysis tools once they have learned skills.

Our statement is that Collaborative MR environments could help us facing these issues. As presented in Figure 1, having

both security and situational awareness options to the same environment could be beneficial to cyber analysts, as they will be able to exchange information and to face simulated crisis by using different roles or levels of details on situations.

We are willing to exchange around this topic during the workshop, and especially around two axes:

- What are the use cases of Mixed Environments for Cybersecurity apart from learning and data analysis?
- What could collaboration bring to the previously cited use cases?

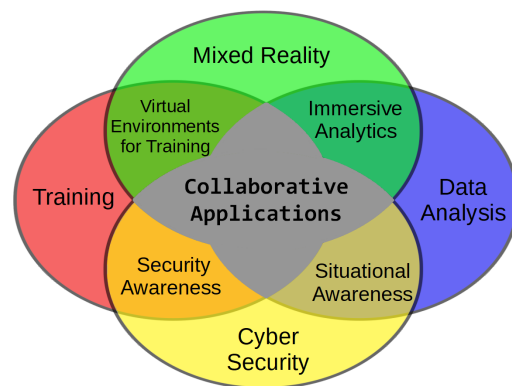


Figure 1: Venn diagram of the links between Mixed Reality and Cyber security through training and data analysis

¹This work was done at the chair Cyber CNI with support of the FEDER development fund of the Brittany region.

References

- [1] Alexandre Kabil, Thierry Duval, Nora Cuppens, Gérard Le Comte, Yoran Halgand, and Christophe Ponchel. Why should we use 3d collaborative virtual environments for cyber security? In *2018 IEEE Fourth VR International Workshop on Collaborative Virtual Environments (3DCVE)*, pages 1–2. IEEE, 2018.