IT²EC 2020 – Virtual Reality for Conduct After Capture

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Abstract Conduct After Capture training is targeted at military personnel who are believed to be at the greatest risk of capture. This leaves large numbers of the military who find themselves being subjected to capture, having not received any training. This document outlines the development and use of a prototype head mounted display (HMD) virtual reality (VR) system for use within the military field of Conduct After Capture (CAC, allowing for a wider audience of military personnel to be exposed to Conduct After Capture training.

1 Purpose and Benefits

The purpose of this document is to present the idea of using Head Mounted Display (HMD) Virtual Reality (VR) within Conduct After Capture (CAC). From observing various CAC training sessions, it became apparent that there are limitations on the number of military personnel who are receiving CAC training.

It is believed that by using VR within CAC, CAC training will become more readily available to military personnel. Additionally, it is believed that VR for CAC can also be used refresher training for military units being deployed sometime after their CAC training has been completed.

2 Introduction

The concept of HMD VR is based within science fiction and was first written about in the story Pygmalion Spectacles [1].

In more recent years, there have been numerous articles covering the use of HMD VR within the military, mainly relating to Post-Traumatic Stress Disorder (PTSD)[2]. Additionally, there has been further study exploring the use of HMD VR for stress inoculation relating to military medical females [3].

In addition, there have numerous studies discussing the survival pipeline and the processes that people go through in order to survive various situations [4].

3 Development of VR for CAC

In order to address VR 4 CAC, observations were made at various CAC training sessions and suitable scenarios for a VR environment were identified. The types of kidnappers within hostage situations were also identified. [5].

Following this, a number of scenarios were planned along with systems flow charts and scripts. This concept was presented to the annual CAC Symposium at the International Special Training Centre in Pfullendorf, Germany [6].

The Danish Conduct After Capture section then identified various instructors who would be able to act out these scenarios. During December 2019, the prototype VR for CAC system was filmed and developed using a Ricoh Theata V 360-degree camera, and the Unity software development environment.

Fig. 1. Filming a scenario with the 360-degree camera

This resulted in a working prototype VR for CAC system being development that included scenarios covering the CAC spectrum from shock of capture, through to release.

Due to cost constraints, this prototype system has been developed using Google Daydream, as this is based on readily available mobile phone technology [7]. However, as

of November 2019, Google announced that it has deprecated support for the Daydream VR platform [8].

Fig. 2. View from within the HMD

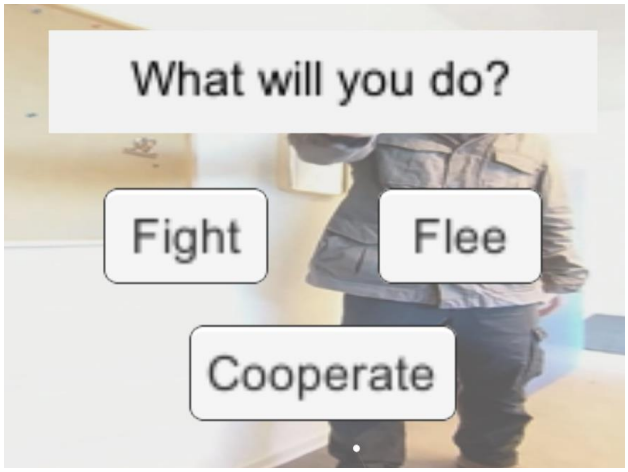

Fig. 3. Options presented to the wearer of the HMD

4 Results and Discussion

The VR 4 CAC prototype system has only recently been developed and therefore requires further testing to generate effective results.

However, following initial demonstration and testing with ten CAC instructors, the follow results were recorded:

[Information to be added]

It should be noted that these results are based only on user experience and further testing is required to establish results relating to stress inoculation relating to CAC.

5 Lessons Learned

At this stage, most of the lessons learned relate more to the technical development of the HMD VR for CAC prototype system. Examples of this include recording scenarios within rooms with ultra-violet lights, file size limitations, charging issues and concerns for the actors constantly dropping in and out of character while waiting for scenarios to be setup.

However, in the longer term, it is envisaged that developments within the VR scenarios will be implemented based on user feedback, testing and external monitoring.

6 Future Work

The next step is now to test the VR for CAC system within a CAC training centre.

It is proposed that the testing is conducted with a group of CAC trainees whereby they undertake the same initial CAC theory training. Following the theory training, and before the practical training component, the group is split into two.

Group one uses the VR for CAC system while group two do not. Then both groups partake in the practical aspect of the CAC training course.

Using this testing method, we believe that it will be possible to measure the stress inoculation experienced by the two groups, allowing for the effectiveness of VR for CAC to be reported. It should be noted that stress inoculations metrics are based on physiological measurements taken before, during training sessions [9].

7 Conclusions

It is believed that HMD VR technologies can be effectively used for CAC training, provided that the testing demonstrates that a reasonable level of stress inoculation can be achieved,

By using HMD VR for CAC, it will be possible to expand the number of military personnel receiving CAC training as well as providing exposure to a wider number of scenarios. Additionally, the VR system is based on readily available technologies, therefore making it a cost-effective solution.

It is believed that, as this prototype system has been developed with the direct input of CAC instructors, that there will be a high acceptance of this technology, particularly within the CAC level A courses.

Beyond the military applications of HMD VR for CAC, there has been interest from international NGOs and other government agencies who work within hostile environments. The HMD VR for CAC system could be easily adapted to incorporate hostile environment scenarios.

Acknowledgements

We would like to thank the following organisations and people for helping to turn this project from concept to reality: The International Special Training Centre, the

Danish Conduct After Capture Section and John 'Blue' Cole.

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Author/Speaker Biographies

Peter Moore
Before working in international development, Peter Moore completed a BSc (Hons) in Information Technology at the Nottingham Trent University, UK an MSc in Computer Science from the University of East Anglia, UK.

On the 29th of May, 2007 Peter Moore and his four British guards were captured by a Shia Militia while working within the Iraqi Ministry of Finance in Baghdad. Over time, the four British guards were killed and Peter was eventually released 946 days later in an exchange deal.

Captain Anders
[Information to be added]