

Work in Progress Report: Virtual Courtroom to Prepare Victims of Sex Crimes for Court Proceedings

Helga Margrét Ólafsdóttir
CADIA, Reykjavik University
Reykjavik, Iceland
helgamo12@ru.is

Hafðís Sæland
CADIA, Reykjavik University
Reykjavik, Iceland
hafdissae13@ru.is

Edit Ómarsdóttir
CADIA, Reykjavik University
Reykjavik, Iceland
edit15@ru.is

Hannes Högni Vilhjálmsón
CADIA, Reykjavik University
Reykjavik, Iceland
hannes@ru.is

ABSTRACT

Sex crimes and aggravated assaults are some of the most difficult cases to be tried in court, especially for the victims that need to take the witness stand in the presence of the accused, the judge and other participants of the proceedings. Victims are already strained by the nature of their situation, and the additional burden of needing to face their alleged perpetrator again under unfamiliar circumstances and become the focus of everyone's attention, can become overwhelming and cause severe anxiety. Today, courtrooms are sketched on paper to prepare the victims, e.g. by showing them a seating arrangement, but the effectiveness of this method has been questioned. Therefore, an ongoing pilot project, in close collaboration with the police, the court system and psychologists working with young victims of sexual assault, is exploring the use of an interactive court proceedings simulation in VR. The simulation involves a recreation of the exact location of the planned proceedings, as well as some of the social factors, using virtual humans. This extended abstract describes work in progress, focusing on the motivation for doing this, why this might be an effective approach, and a working prototype.

CCS CONCEPTS

• **Human-centered computing** → **Virtual reality**; • **Applied computing** → **Interactive learning environments**; *Sociology*; *Law*.

KEYWORDS

simulated courtroom; virtual reality; sex crime victim; anxiety

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1 INTRODUCTION

During discussions with the police about the possibilities of applying the latest Virtual Reality (VR) and Virtual Human technologies for training personnel, it came as a surprise when it was suggested that those potentially benefiting the most from such advanced training methods would be the victims of sex crimes and aggravated assaults preparing to testify in court. These individuals need to get ready to enter an unfamiliar room, take the witness stand, and speak up in the presence of the accused, the judge and other participants of the proceedings. Psychologists working with these victims explained that the pre-trial process, which can extend over a long period of time, is usually very stressful. This kind of build-up of stress, not only impacts the victims' health and quality of life up to the trial, but it can also negatively impact the quality of the eventual testimony. One of the psychologists, working with young victims of sex crimes, mentioned that ages 15 to 18 years were especially vulnerable and very fearful of trial.

Today, psychologists sketch the layout and seating of courtrooms for the victims, to explain the proceedings, and to some extent, address their anxiety. These experts still feel more needs to be done, and see an immense potential in applying immersive VR, especially for young victims, who are already more technologically evolved and possibly more accepting of new paradigms.

The potential for VR to impact training and therapy has been known since the inception of the technology several decades ago, but a high price point and poor user experience [23], including simulation sickness [19], limited practical appeal. High-quality VR equipment has now become better, more accessible and more affordable which has opened up possibilities for more general use.

This project capitalizes on the latest advances in VR, while building on promising results from VR exposure therapy, and focusing on the problem of witness testimony being negatively affected by the psychological state of the witness. The aim is to simulate a courtroom in VR to prepare victims of sex crimes for testimonies, to mitigate negative psychological factors stemming from entering an unfamiliar and potentially threatening social situation. The project is conducted in close collaboration with domain experts from the legal system, including psychologists working with victims. Interviews and background research has been conducted, a prototype VR environment has been built, and an initial expert evaluation has taken place.

2 BACKGROUND

2.1 Stress in the Courtroom

Psychological states such as stress, anxiety and insecurity have been found to negatively impact the performance of cognitive tasks [6, 18]. Furthermore, it has been found that memory retrieval of emotionally arousing material is especially vulnerable to the negative effects of stress hormones [8, 9, 22, 25]. Therefore, it is no surprise that research regarding the effect of the psychological state of witness testimony has found that anxiety can negatively impact memory accuracy [21].

Thus it is especially important in cases where a victim is a witness, to provide some kind of assistance to reduce psychological factors that could impact its testimony. It could be done with pre-trial assistance such as providing information about court procedures and orientation of an empty courtroom [13]. With more information and involvement of the victim in the legal process before trial, the testimony can be made less frightening and consequently the possible negative impact on their memory during the process to some extent reduced. This has been the role of a psychologist working with the victims prior to trial, but their tools and opportunities for accomplishing this preparation have been limited.

2.2 Training with VR

VR has been used to prepare professionals in a wide variety of disciplines including medical and surgical training, emergency and safety training, shipboard training, nurse training and even training for mental-disease professionals [7, 12, 23]. Some of the limitations of the first generations of VR equipment have led to limited results confirming strong learning outcomes compared to traditional media, but more recent VR training research is showing stronger behavioral and cognitive effects. For example, recall of information presented in a disability simulation was shown to be greater in an immersive version than a non-immersion version [5], and earthquake safety behavior was significantly better after VR-based safety training than a traditional video course [11].

2.3 VR and the Legal System

When it comes to the justice system, law enforcement is a profession that has started using VR in training. Dangerous situations, where in real life, mistakes can have devastating consequences, can be simulated, providing a safe and controlled training environment [24]. Virtual Humans are also being developed to train law enforcement in suspect interrogation [4]. Taken together these technologies offer great potential.

Advanced technology is also becoming more important in courtrooms, especially in the presentation of evidence and information [10]. This includes VR walkthroughs of incident scenes [20]. Virtual reality also has potential for courtroom training [3], for example to help law students train their legal skills [17].

2.4 VR and Exposure Therapy

VR has been promising in exposure therapy for many psychological disorders [2]. Exposure therapies are especially effective in treatments of anxiety disorders, where fear is the foundation. With exposure therapies the fear structure of the brain is directly accessed

and available for modifications, while the individual experiences the difficult and fearful situation in a safe and controlled environment. Virtual reality exposure therapies have shown to be equally effective in treating fear of flying (aviophobia) as normal exposure therapies in a real airplane [15]. Promising results have also been found in treating (acrophobia) [16] and in treatment of social anxiety disorder where it seems to be as effective as an exposure group therapy [1]. Furthermore, research of virtual reality exposure therapies for Vietnam combat veterans with post traumatic stress disorder (PTSD) have found a decrease in PTSD scores following treatment [14].

3 PROGRESS

A real courtroom (see Figure 1) has been re-created in VR (see Figure 2) and tested using the HTC Vive VR headset. The only thing left is to track the physical witness chair with the Vive system, to provide a stronger physical sensation as the witness takes a seat.

The courtroom is populated with virtual humans capable of attending to whoever is currently speaking, as determined by a fairly linear script following formal proceedings. The judge asks the victim to take a seat and introduce themselves, as other members of the court watch.

The construction of the courtroom was done in cooperation with the chief judge and the deputy chief judge of the Reykjavik District Court. They provided useful information about the layout of courtrooms and explained a general trial process. They also provided direct access to a particular court room for gathering reference material.

An initial evaluation of the virtual courtroom was conducted with domain experts, including a psychology scholar, the chief judge and the deputy chief judge of the Reykjavik District Court, chief sociologist of the Capital Police as well as the chief of police. Everyone thought the room looked very convincing and got the feeling they were in a real courtroom, which felt strict and formal. The nervous behavior of the accused felt particularly credible. One of the experts said they could now understand how being a witness can be overwhelming and were very grateful for the opportunity to switch roles with the witness. They all agreed on the importance of being able to practice in the virtual courtroom environment and how that might relief stress and improve memory recall of the witness in the actual testimony.

4 CONCLUSIONS

While several professions are already benefiting from VR training, it is important to think about how this technology could benefit nonprofessionals entering unfamiliar and taxing situations. The courtroom is a particularly interesting setting to simulate, where even a brief preparation exposure for someone with no court experience might have considerable impact, both on that person's level of anxiety and on the quality of the final court proceedings.

This is a report on work in progress, focusing on what motivated the work and its potential for impact, based on related prior results as well as preliminary evaluation. It has been crucial for this project, including for the discovery and formulation of the problem being addressed, to be in close cooperation with the domain experts. Testing with actual users is yet to be done but the testing with

