ARVR & DIGITAL EVIDENCES

As technology rapidly advances, a greater array of industries is adopting virtual reality (VR) in order to achieve their goals. One field where VR is emerging is forensics, where increasingly powerful tools can allow parties on all sides of an issue to broaden their perspectives of an incident, ultimately leading to better-informed conclusions.

Of course, that's not to say that VR technology is necessary in all circumstances or will replace other forensic techniques completely. Several forensic researchers are currently experimenting with the uses of VR and its effects in the courtroom.

WHAT IS VIRTUAL REALITY?

Before delving into its potential uses in criminal justice, it is important to first understand the basics of virtual reality. As described by the Virtual Reality Society, virtual reality is a term "used to describe a three-dimensional, computer generated environment which can be explored and interacted with by a person." Furthermore, "that person becomes part of this virtual world or is immersed within this environment and whilst there, is able to manipulate objects or perform a series of actions." Ultimately, it is a reality that only exists within our perception.

In order to experience a virtual reality simulation, a person must be equipped with some type of VR device, such as the Oculus Rift. This consists of a headset with a display and headphones, allowing the wearer to experience the VR simulation both visually and auditorily. Simulations are often designed and developed specifically for the Rift or other VR/AR hardware on the rise.

The Oculus Rift and other VR devices are often utilized for gaming purposes. While a majority of people currently use the technology for entertainment, those within the field of forensics are coming to realize VR's potential to be a powerful tool in pursuit of justice.

HOW CAN FORENSIC SCIENTISTS USE VR TECHNOLOGY?

The adoption of VR simulations by all forensic scientists is likely to be far off, since the technology itself is not yet widely available. Some have already been experimenting with the use of VR technology as a form of forensic evidence. Here, jurors in this case would be able to immerse themselves into a recreation of the crime scene, allowing them to use additional senses in coming to a decision about a verdict in a case. Furthermore, because virtual reality is only a simulation, forensic scientists would have the ability to modify the scene as they see fit, removing objects or images that may not be relevant or that may be offensive to viewers.

Of course, the potential use of virtual reality in the legal system likely extends far beyond that. In time, it is likely that this technology will be used in myriad ways in the form of additional evidence.

AUGMENTED REALITY AND ITS POTENTIAL USE

Another form of technology that will likely be in widespread use by some in the law enforcement industry in coming years is that of augmented reality. While virtual reality technology creates an entirely new simulation for a user to experience, augmented reality technology simply modifies the user's experience in our existing world. The most well-known example is the popular mobile game Pokemon Go.

Consider, for example, a crime scene that is littered with potential evidence. When the police officers arrive at the scene, they may not necessarily be the most qualified for the process of forensic investigation. With this AR technology, however, they can broadcast the scene to forensic experts at another location, who can then instruct the police officers or CSIs what to bag for evidence. For example, as the article describes, if the police officer comes across a bottle of chemicals that would be relevant for forensic experts, they may then flash a large green arrow in the officer's display, representing instructions to pick up this item.

NOT A PERFECT SCIENCE – THE DRAWBACKS OF VR AND AR

Naturally, as with any advancements in technology, the benefits of both virtual reality and augmented reality come with a handful of drawbacks. And while the pros may outweigh the cons in these situations, the negatives are always important to consider before widespread adoption of a new tool, especially in the field of forensics, where precision and care is of the utmost importance.

In the case of virtual reality technology, for example, simulations could be recreated to view the scene of the crime from the perspective of a certain individual. This could lead to a possible bias in the courtroom among a jury. By illustration, one person who develops digital reconstructions, Damian Schofield, was quoted by New Scientist as saying that "Think of a murder scene: whether you view it from the point of view of the murderer, the victim or a third person will totally change your perception of what's happening."

In regards to augmented reality technology, distraction may be a large concern of those utilizing it at the scene of a crime or in other circumstances. Because law enforcement officers equipped with AR technology will be receiving additional information from third parties at other locations, they will not be able to remain fully focused on the information directly in front of them. Instead, they will be required to utilize their existing faculties, along with the

expertise of those guiding them through the scene. Furthermore, as described by one of the articles in New Scientist, the AR technology is not suitable for use when making an arrest, "because officers trialling the system sometimes found the additional information distracting." This means that anyone in possession of this technology will need to fully understand the appropriate times for use.

As of now, it is likely that trusted forensic techniques will continue to have a place in the world of forensics, at least in the near future, but both VR and AR may provide forensic scientists and other industry professionals an additional tool that allows them to develop a more comprehensive picture of a crime scene.

A GROUNDBREAKING NEW TOOL FOR THE FIELD OF FORENSICS

There is no doubt that both virtual and augmented reality are causing massive changes worldwide. This technology belonged in the realm of fantasy only a decade ago, and now it is commonly seen in the transportation, education, and entertainment industries, among others.

In short, VR/AR will likely have a useful place in the field of forensic science, allowing these professionals to recreate a crime scene for others to witness, or to communicate more efficiently with experts at another location.