

Appendix K

Virtual Crime

Introduction

The context for this appendix comes from the discussion in Chapter 1: “Cyber means combining forms relating to Information Technology, the Internet and virtual reality.” In this appendix, we have discussed several interpretations of virtual crime and detailed on how a virtual crime scene can act as a medium to help investigating officers to assess the case and come to a conclusion speedily.

There are several interpretations of the term “virtual crime”:

1. Virtual crime or in-game crime denotes a virtual criminal act that takes place in a *Massively Multiplayer Online Game* (MMOG), also known as “*Massively multiplayer online role-playing game* (MMORPG).”^[1] The readers who are interested to know more about availability of online games (i.e., MMOG/MMOPRG) may visit http://en.wikipedia.org/wiki/List_of_massively_multiplayer_online_role-playing_games. The enormous time and effort invested into such games can lead online “crime” to spill over into real-world crime, blurring the distinctions between the two. Some countries have introduced special police investigation task force to cover such “virtual crimes.” For example, South Korea looked into 22,000 cases in the first 6 months of 2003. The readers may visit <http://news.bbc.co.uk/2/hi/technology/4397159.stm> to know more on this subject matter. (In Chapter 11, Section 11.2.19, a case related with IPR is explained).
2. LambdaMOO is a virtual community that allows players to interact using avatars. The avatars are controlled by the users, that is, they are user programmable and may interact automatically with each other as well as with objects and locations in the community. “A rape in cyberspace” describes a “cyberrape”^[2] in a multiplayer computer game or MUD called LambdaMOO.
3. One of the scholar defined virtual crime as a need to have all the qualities of a real crime, and so it is not a new subset of crime at all. Conversely, it is said that the connection between virtual crimes and real crimes are “tenuous at best – It is a link between a brutal rape and a fictional story of a brutal rape. It is important to note that, the difference is more striking than any similarity.”^[3]
4. Virtual crime scenes are the medium which police forces can use to investigate the case by re-producing them on the computers.

Law Enforcement Agencies and forensics experts face challenging situations while examining a criminal case. Investigators need to gather as much information as possible, that too quickly, while doing their job and not disturbing the crime scene itself. The site of a crime can only be preserved for a short time, particularly if it is in a public area. At the same time, crime photographers shoot the scene from multiple angles to preserve a sense of scale to ensure the pictures are meaningful – both to investigators and further in the court of law.^[4]

The Indian Television crime scene investigation serials like “CID” and Hollywood Television crime scene investigation serials like “CSI” and “Bones” appear to be an exaggeration and oversimplification of reality. In these serials, investigators look at amazing three-dimensional holograms of bodies or buildings; rotate them in real space without any recognizable input device. In practice, Law Investigating Officers (i.e., police forces) use virtual reality technology to recreate a crime scene using computer graphics. Investigating officers have realized by now that adequate use of virtual environments helps the investigation process from its earliest stages till the courtroom conviction. Let us understand the two most common techniques used in crime scene recreation.

Virtual Crime Scene Graphics

The virtual crime scenes are created using computer graphics. Investigators take the measurements at a crime scene, that is dimensions of the scene, and the relationship between all the objects inside the scene to recreate it using computer models. For example, in a murder scene, an investigator takes the dimensions of the room, the position of the body and the location of any other related objects such as weapons or blood. These measurements are taken carefully, by using laser distance meters or a surveyor's tool, to ensure accuracy of measurements. The advantage on such virtual crime scenes is that investigators can view the scene from any angle, including from vantage points. A 360° view provides an advantage to the investigators to look at the scene from different perspective. Investigators can have more information that can help them to determine the course of events at a crime scene accurately.

Several organizations developed numerous techniques and methods that are used into computer graphics products and are available in the market. Some products facilitate the user to add in animations, allowing investigators to view their theories in action. Few products support video output like a head-mounted display and the user can experience a strong sense of immersion, which may help witnesses recall more details about the event and allow investigators to check lines of sight.

The readers may visit <http://www.crime-scene-vr.com/> to know more on CSVT Tool (Crime Scene Virtual Tour).

Photogrammetry

Photogrammetry is another way to recreate a crime scene using computers. Photogrammetry is a technique wherein many different photos of a location are combined into a 360° image. Investigators can look around the scene by using various controls like a mouse to click and drag on the photo itself to change the view. This is similar to viewing the pictures of a hotel/resort on a website before booking a room in it.

A special camera mounted on a tripod that can rotate the camera's view in 360° is used to take a series of pictures and sends them to a computer. Photogrammetry systems have proprietary software to combine these photos together to make a seamless photograph of the environment. Investigators can change the point of view for the photo, turning in any direction. The only disadvantage of photogrammetry system is, as the camera is on a stationary tripod, the camera will not capture any areas in an environment where the view is obscured from the tripod's position. Investigators may have to move the tripod and take another series of photos to capture that perspective.

One requires four types of software to create and/or re-creating the crime scenes successfully:

1. **Image editing software:** Used for alignment, verification and archiving.
2. **Drafting and modeling software:** Used to create the two- and three-dimensional diagrams and models of the crime scene, that is, CAD (computer aided design/drafting) products.
3. **Photogrammetry software:** Used to create 3D (three-dimensional) models from photographs and to allow accurate measurements to be obtained from photographs.
4. **Presentation software:** Used to display the re-creation. It is easier to switch between crime scene photographs and crime scene reconstruction through slide shows and transition effects.

While choosing the product, that is, software, for reconstruction of virtual crime scenes, the following points should be considered:

1. **Easy to use:** As the users of such products are Crime Scene Investigators and not computer geeks, users may lose interest into the product in case there is a steep learning curve [i.e., it takes long time to understand the features of the product from the functional and operational (usable) perspective]. Training is an important aspect while purchasing any software product and the more people are willing to use a product, the more proficient they become at exploiting its full potential.
2. **Compatibility:** The products that use common file formats allow smooth transitions while importing or exporting projects. This also calls attention toward file format which permits you to bring your created file into other product for special effects or advanced rendering. At the same time, proprietary formats are equally challenging in terms of compatibility. If the defense cannot make use of the work you created, you may not be able to use it in court.
3. **Version Upgrade:** Software Product Vendors usually stop their support for older versions and upgrade is enforced on the customer. Unless there is a major revision to the software, the new version is NOT released by the vendor. You will have to assess your need/requirement for these software products and then choose appropriate version suitable for those needs.

In summary, virtual crime scenes reconstruction and analysis on the logical extensions of the crime scenes are investigator's craft. Those who require to concentrate entirely on reconstruction analysis can only do so while relying on the efforts of the crime scene investigator. A crime scene investigator can develop an eye, through experience and training, against what is needed in order to interpret the meaning of collected information and photographed.

References

- [1] To know more about MMORPG, visit:
http://en.wikipedia.org/wiki/Virtual_crime (15 January 2011).
- [2] To know more about cyber rape, visit:
http://en.wikipedia.org/wiki/A_Rape_in_Cyberspace (15 January 2011).
- [3] To know more about virtual crime, visit:
http://en.wikipedia.org/wiki/Virtual_crime (15 January 2011).
- [4] To know more about *How Virtual Crime Scenes Work*, visit:
<http://people.howstuffworks.com/vr-csi.htm> (15 January 2011).

Further Reading

Additional Useful Web References

1. Read article *What is a Virtual Crime Scene?* at:
<http://www.wisegeek.com/what-is-a-virtual-crime-scene.htm> (15 January 2011).
2. Read article *Does virtual crime need real justice?* at:
<http://news.bbc.co.uk/2/hi/technology/3138456.stm> (15 January 2011).
3. Read article *Game theft led to fatal attack* at: <http://news.bbc.co.uk/2/hi/technology/4397159.stm> (15 January 2011).
4. Read article *A Primer on the Tools of Crime Scene Analysis* at:
<http://www.crime-scene-investigator.net/ToolsofCrimeSceneAnalysis.html> (15 March 2011).