Introduction
Crime scene reconstruction programs should be used to depict the scene as found, or explain what could or could not have happened based on the evidence available. These software programs should not be used to recreate the events of the crime. The idea of crime scene reconstruction has been around longer than fingerprint identification [1]. Crime scene reconstruction is a procedure that involves taking all of the physical evidence, along with context of the scene, and trying to determine the actions that occurred. It is then the responsibility of the crime scene analyst to attempt to put an order to the events [2]. When trying to piece together what happened, an investigator must remember that every action had an effect on every other action and or condition that followed [3].

In a court of law, crime scene reconstruction is considered demonstrative evidence. “Demonstrative evidence is evidence that illustrates or helps explain oral testimony, or recreates a tangible thing, occurrence, event, or experiment” [4]. Crime scene reconstruction gained popularity in the courtroom in the early 90’s. Since then, computers using animation to reconstruct crimes have been used in place of hand drawn sketches and photography. These computer animations have enhanced the information for the jury, because people have five times more likely to remember what they have seen, rather than what they have heard [6]. It is also possible, while reviewing a visual representation of the scene, that eyewitnesses can be reminded of specific events or flaws can be pointed out and corrected [3]. The purpose of this research project was to compare and evaluate three crime scene reconstruction software programs. In order to do this, the products were obtained either by an available license or a demonstration license that provided the same features as a full license would. Crime Zone by CAD Zone, 3D Eyewitness by Design Ware Inc., and FX3 by Visual Statements all had similar features and either full copies or demonstration licenses were available. A survey was also sent to 149 law enforcement agencies. The comparison of the three different programs can provide information to law enforcement agencies looking to purchase a crime scene reconstruction software program.

Law Enforcement Questionnaire
A brief questionnaire was created with the assistance of Corporal Steve Compton of the Huntington Police Department that asked ten questions regarding the use of crime scene reconstruction software programs (see attached questionnaire). The questionnaire was electronically sent to 149 different law enforcement agencies of varying sizes in the United States. Additional efforts were made to contact law enforcement agencies that did not provide contact information on their websites. The data from the questionnaire was used to determine whether or not law enforcement agencies using crime scene reconstruction programs, the most popular software program, and the problems and benefits of the different software programs.

Reconstruction Computer Programs

Visual Statements FX3
FX3 is a CAD based program that also uses simulation, and is one of the many products offered by Visual Statements. FX3 includes features such as SmartRoads and SmartRooms that allow for quick rendering only, 3D Eyewitness is the most user friendly and provides professional looking sketches with 3D visualization that should suit any courtroom needs.

3D Eyewitness
3D Eyewitness is a CAD based program, and is one of several programs offered by Design Ware Inc. Design Ware Inc. has programs for architectural design and programs designed for use in a laboratory setting to help teach physics and electronics. 3D Eyewitness is specifically designed for law enforcement, and is used for crime scene reconstruction, traffic accidents, and pre-raid planning. The entire program costs $349 and comes with a training booklet and tutorial CD.

Crime Zone
Crime Zone is a CAD based program by CAD Zone and is one of many programs offered by the company. CAD Zone offers a variety of programs that are designed with a particular user in mind, such as crime scene investigators, accident reconstructionists, and fire investigators. Crime Zone was first released in 1995 after the company worked with law enforcement personnel and attorneys who helped in the development. The entire program costs $609, tutorial videos are available online, technical support is free, and there is also a $600 training course that can be purchased. Crime Zone version 8.3 was used for comparison and evaluation.

Final Diagrams (Inside)

Survey Results

Conclusion
All three of these programs can take a 2D sketch and quickly convert it into 3D. FX3 is the only one that offered animation, but using animation in a courtroom setting requires extensive knowledge of the program as well as the physics behind any simulation. FX3 can also become quite expensive in order to have all the features associated with the demo, and requires an expensive computer for use. Crime Zone was not intuitive and was the most difficult to use, especially without much technical support.

When the law enforcement agencies were contacted for help with the questionnaire, several requested results when the comparison and evaluation were completed. Based on the three programs evaluated, if the funds are available and animation is required, FX3 by Visual Statements would provide the best graphics and offer the most capabilities. If budget is an issue and the agency wants a program for sketching and 3D rendering only, 3D Eyewitness is the most user friendly and provides professional looking sketches with 3D visualization that should suit any courtroom needs.

References

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