



Using the FARO Laser Scanner to Create Forensic Animations

Challenge

In a short amount of time scan all vehicles on scene and scan the entire apartment complex where the incident occurred. This involved an area approximately 61 x 61 meters, or 200 x 200 feet, and included exemplar vehicles.

Solution

To capture all the information needed in one day, the FARO Laser Scanner and FARO SCENE software was the chosen method by Dustin Forensics to provide them what they needed for their project.

Results

By utilizing the FARO Laser Scanner and SCENE software on this project the Dustin Forensics team reported they reduced the amount of time it takes to construct a 3D environment by at least two weeks. The added speed and efficiency allowed them to complete the project on time and save their customer money.

Customer Profile



Customer:
Dustin Forensics

Website:
www.dustinforesics.com



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Dustin Forensics is the product of its founder's lifelong interest in computer animation and his experience with 3D software applications. Early in his engineering career, David Dustin found it difficult to communicate technical concepts to executive management. His solution was to animate proposed equipment purchases, providing a 3D view of the potential installation. This approach let non-technical managers visualize complex equipment without needing to understand piles and piles of two-dimensional drawings.

For David Dustin, forensic animation was the next step. Photo-realistic animations can be used by a forensic investigator to demonstrate what they believed happened at a scene. Data gathered at the scene of a crime or crash is used by the investigator to create the most accurate animation possible.

And so Dustin Forensics was born. Located sixty miles north of Atlanta in Adairsville, Georgia, the company provides service to all of North America. Their services include: 3D scanning, accident recreation, forensic animation, industrial visualization, and many other similar applications.

Application Summary

One recent application that Dustin Forensics worked on was a project to scan an apartment complex and its vehicles to recreate a 3D environment for use in litigation. Dustin Forensics was given a timeline of about a month and half with an objective of providing a graphical representation of a ballistic expert's opinion as to how a sequence of events transpired – with a corresponding goal of discrediting the opposition's position.

Real-time environment showing character positions, motions, and the ballistic path of the shot fired during the incident are the deliverables that the Dustin Forensics team were hired to provide.

One of Dustin's teams biggest challenges of this particular project was that time was very limited. Also, the victim in this case was shot on their right side, but the client maintained the victim was exiting the vehicle and had turned their body. It was Dustin's initial perception that it would be somewhat difficult to align the shot, but, in reality, it was not.

“Using the FARO Laser Scanner is quite easy and the amount of data collected is amazing. Improved utilization of scan data will allow us to construct our scenes with an even greater degree of accuracy. Our crime scene recreations will be greatly enhanced with FARO scan data.”

*David Dustin,
Owner, Dustin
Forensics*



Figure 1. 3D environment created by a scan of an apartment complex and its vehicles for use in litigation.



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The challenge

In addition to scanning vehicles, the company would need to scan the entire apartment complex where the incident occurred. This involved an area approximately 61 x 61 meters, or 200 x 200 feet, and included exemplar vehicles.

Dustin Forensics looked at various scanning technologies that might be able to perform the needed scans. While a total station could have scanned the apartment complex, it would rarely be able to capture all of the data points required to accurately reproduce the targeted environment. More conventional measurements would have worked, but might have been suspect as capturing curves and radii are more difficult.

Additionally, it had not been determined exactly what objects would be deemed important at a later date – i.e. doorway, stairs, or window locations. Dustin believed that a 3D Laser Scanner was the best tool to use to document the scene, since the entire environment could be captured in a few scans. The 3D “point cloud” of data captured by the scanner would provide a highly detailed, accurate model of the entire scene. Another advantage of using a laser scanner was the ease of mapping the interior of the needed vehicles. Attempting to capture vehicle interior features with a total station would be very cumbersome and would not yield the required level of data. A laser scanner is capable of capturing much more detail.

The solution

Using a FARO Laser Scanner and SCENE software, Dustin Forensics were able to scan and process all the data they needed in one day.

Previous exposure of associates and software engineers familiar with FARO systems led David Dustin to the FARO Laser Scanner. The FARO Laser Scanner’s speed and quality of data captured proved to be a dramatic improvement over Dustin’s past measurement methods. It has quickly become an indispensable tool for the company.

They were able to capture all the information they needed in one day (at two locations) to provide them the data they needed for their project. FARO’s SCENE software was used to register the scans together into one point cloud. Dustin found it very easy to use the point cloud data in 3D animation software.

Dustin’s team learned some valuable lessons while scanning vehicle interiors. They learned by creating mesh surfaces from the scan data this would give them a realistic appearance in their animation.

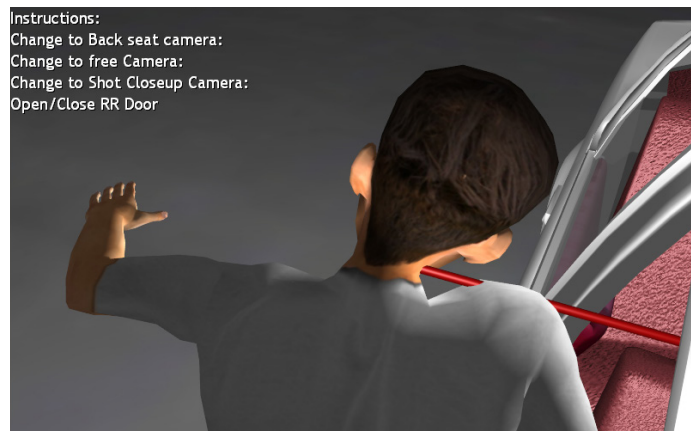


Figure 2. 3D model created as a result of scanning the scene with FARO laser scanners and SCENE software.



CASE STUDY

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The result

Return on investment

Dustin Forensics can now construct their desired environments much faster and more accurately than they did before. The added speed and efficiency allows them to spend more time on animation.

"For us, it's not as much about time or money saved, but rather that we would have struggled to complete this project on time if we would not have used the FARO Laser Scanner and the scan data we captured," said David Dustin. "Overall, the Scanner should reduce the amount of time it takes us to construct a 3D environment by at least two weeks per project," said David Dustin about his team's experience.

"Using the FARO Laser Scanner is quite easy and the amount of data collected is amazing," said David Dustin. "In fact, using it makes me feel like a genius. I'd also like to say it even makes me look thinner, but unfortunately that is not true."

For Dustin Forensics, the greatest value in using the technology provided by the FARO Laser Scanner is decreased environment creation time and improved accuracy of "incidental" objects. If traditional measurement methods were used at a scene, only the obvious objects would be documented. With the laser scanner, the entire scene is captured so even small details that may have been overlooked can be examined later.

"Improved utilization of scan data will allow us to construct our scenes with an even greater degree of accuracy," said David Dustin. "Our crime scene recreations will be greatly enhanced with FARO scan data, and we will save a substantial amount of time with the ability to revisit a scene in 3D any time we, or our clients, need to."

"For us, it's not as much about time or money saved, but rather that we would have struggled to complete this project on time if we would not have used the FARO Laser Scanner and the scan data it provided us to work with," said David Dustin.

"Overall, the Scanner should reduce the amount of time it takes us to construct a 3D environment by at least two weeks per project."

*David Dustin,
Owner, Dustin Forensics*



Figure 3. Point cloud data resulting from the 3D scan of the apartment complex.

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