

Use of Computer-Generated Animation or Simulation at Trial

By Salvatore J. DeSantis, Alice Spitz and Ayesha Syed

The litigation tool that arguably has the greatest impact on a jury is the presentation of a computer-generated accident animation or simulation. This is especially true in the transportation area where the trucking industry is viewed as a deep pocket and jurors have preconceived notions that tractor trailers can be a menace on the road. Although they are relatively expensive to produce, the use of such visuals is amply justified by a favorable verdict for the side who produced it. A visual reconstruction of how an accident could have, and could not have, happened will clearly be more influential than the theoretical and technical jargon-filled testimony of an accident reconstruction expert and/or biomechanical engineer without the benefit of visual aid. Additionally, as older jurors are replaced by youngsters who have grown up with laptops, cell phones, and Nintendo Wii, presentations on computers or TV monitors at trial will be increasingly more necessary and influential.

If the facts of the particular case are suitable for presentation in this format, and time and effort are taken to create an animation or simulation, it is crucial to ensure that it will be admissible at trial. Familiarity with the foundational, procedural, and substantive evidentiary requirements is essential both to presenting visual evidence, or to be able to make informed objections if the adversary produces such visual evidence.

The Distinctions

Animations

The admissibility criterion for computer-generated animations is different from that of simulations due to the different purposes for which they are used. In *Clark v. Cantrell*, where deciding on the admissibility of an animation was a matter of first impression, the court held: "An animation is used to illustrate a witness's testimony by recreating a scene or process, and properly is viewed as demonstrative evidence." An animation does not purport to be a reconstruction of the accident. It is merely a visualization of the expert's opinion of what he or she believes happened based on physical evidence. Usually, animations are not entered into evidence, and the jury does not view them outside of the courtroom. The expert's opinion itself is based on other evidence such as measurements taken at the scene, skid marks, photographs, witness testimony, and the inferences drawn by the expert based on his or her expertise. *Clark v. Cantrell*, 339 S.C. 369, 529 S.E.2d 528 (S.C. 2000).

"A computer-generated video animation is admissible as demonstrative evidence when the proponent shows that the animation is (1) authentic...(2) relevant...(3) a fair and

accurate representation of the evidence to which it relates, and (4) its probative value substantially outweighs the danger of unfair prejudice, confusing the issues, or misleading the jury." *Id.* The animation must relate to evidence in the record, be relevant to a material and disputed issue of fact, and assist the jury in making a determination on the issue. The expert should be qualified to present the opinion, and the opinion must be sufficiently based on facts in evidence. The program that created the animation should be reliable, and it should produce a fair and accurate representation of what it purports to convey, which is the expert's opinion, and the expert should be available to testify. *Id.*

In order for the animation not to be considered misleading, the conditions portrayed in the animation should be substantially similar to those of the actual incident. For instance, the animation must be technically correct on details such as distance, terrain, relative speed, path of travel, and surroundings. The animation should be consistent with the trial testimony of the proponent of the evidence. Lastly, the judge, in his or her discretion, should find that the probative value of the animation is greater than the risk of unfair prejudice. *Id.*

In *Clark*, the testimony of the technician who created the animation and the reconstruction expert who interpreted the actual physical evidence was sufficient for authentication. However, the animation was ultimately excluded on the ground that it was not a fair and accurate representation of the evidence to which it related, namely, the plaintiff's testimony, because her testimony conflicted with her own expert's placement of the defendant's vehicle in the animation. Had it been consistent with the plaintiff's own testimony, it would not have been excluded. The court held: "The fact [*sic*] the animation is inconsistent with testimony or evidence presented by the opposing party should not necessarily lead to its exclusion, provided it fairly and accurately portrays the proponent's version of events." This is so because the animation "does not purport to be recreating the actual incident, only the expert's theory on its cause and result. For this reason, the requirements for the admissibility of an animation are the same as what is required for conventional demonstrative evidence such as charts and models." *Clark v. Cantrell*, 339 S.C. 369, 529 S.E.2d 528 (S.C. 2000).

Examples

Presentations which may be objected to:

Only playing an animation in slow motion, *Suarez v. Ege-land*, 330 N.J. Super. 190, 749 A.2d 372, (N.J. Super. A.D. 2000); including an audio-track containing speech that

could be mistaken for substantive testimonial evidence, *Persley v. New Jersey Transit Bus Operations*, 357 N.J. Super. 1, 813 A.2d 1219 (N.J. Super. A.D. 2003); the testimony of a proponent of the animation contradicting what the expert depicted; *Clark, supra*, and an animation which portrayed a hypothetical placement of a vehicle in a position that clearly contradicted the factual evidence, *State v. Hultenschmidt*, 125 Wash. App. 259, 102 P.3d 192 (Wash. App. Div. 2, 2004).

Since the *Clark* court considered the issue, other courts have also held that authentication can be established upon a showing that the evidence is what its proponent claims it to be, which is the same as the federal standard for demonstrative evidence. In a New York case, a new trial on the issue of liability was ordered based on the Appellate Division's holding that it was an abuse of the trial court's discretion to admit an animation when "the circumstances portrayed in the computer-generated animation were sufficiently different from those which existed at the time of the accident." *Kane v. Triborough Bridge & Tunnel Authority*, 8 A.D.3d 239, 778 N.Y.S.2d 52 (N.Y. 2004). The court held that the jury should have been instructed that "the computer-generated animation was being admitted for the limited purpose of illustrating the expert's opinion as to the cause of the accident and that it was not to consider the computer-generated animation itself in determining what actually caused the accident." The court stated that the lack of the instruction alone would be sufficient basis for a new trial.

Procedurally, an opponent of an animation or simulation must request a limiting instruction to preserve any objections to the animation for appeal. A New Jersey court stated, "Although plaintiff also argues the trial judge should have provided the jury with a limiting instruction regarding the tape, no limiting instruction was requested and even now plaintiff does not identify what the contents of any such instruction should have been." *Persley v. New Jersey Transit Bus Operations, supra*. In *New York*, the court held that a limiting instruction was sufficient to safeguard the decision to admit an animation although the proponent improperly referred to it as a "reconstruction," which the appellant claimed would mislead the jury to treat it as fact. *Datskow v. Teledyne Continental Motors Aircraft*, 826 F. Supp. 677 (W.D.N.Y. 1993).

In a 2008 case an Oklahoma court provided a thorough example of a limiting instruction for the introduction and use of an animation. "For future guidance in the use of animations as demonstrative aids, the trial court should instruct the jury, at the time the animation is offered and allowed as a demonstrative aid and before it is shown..., that (1) the animation is not evidence but is intended only as a visual aid to the jury in understanding certain testimony or evidence presented at trial by illustrating and explaining that testimony or evidence, (2) the animation represents only a re-creation of the proponent's version of the event and should in no way be viewed as an actual

re-creation or recording of the event, and (3) because the animation is intended to assist them as jurors, it may be accepted or rejected in whole or in part. When used only as a demonstrative aid and not as an exhibit admitted into evidence, the animation should be marked as a demonstrative exhibit of the proponent and included as part of the trial court record but should not be sent to the jury deliberation room with the jury." *Tull v. Federal Express Corp.*, 197 P.3d 495, Okla. Civ. App. Div. 2 (2008).

The opponent of an animation should vigorously cross examine the expert regarding his or her method of preparation of the animation at the time it is shown. The opponent should also cross-examine the witnesses whose testimony the expert uses as a foundation for his or her opinion. In *Harsh v. Petroll*, the court decided that since the opponent "chose not to cross-examine these individuals at trial when they were offered or to call them in their own presentation of their case, that was a choice that was made that cannot be undone now." *Harsh v. Petroll*, 840 A.2d 404 (Pa. Cmwlth. 2003).

The animation in *Mintun v. State* depicted an accident from three vantage points, including one that the proponent called "the witness view." The witness who viewed the accident testified as to his own determination of what occurred, which was inconsistent with the animation. Since the proponent testified that he was only presenting his own theory of what he believed an eyewitness would have seen from the vantage point of the actual eyewitness, and the animation was consistent with his own testimony, the court held it to be admissible. *Mintun v. State*, 966 P.2d 954, Wyo. (1998).

Pennsylvania v. Serge provided a procedural guideline for a party seeking admission of a computer-generated animation. The Supreme Court of Pennsylvania advised that the proponent should file a motion *in limine* before trial, and that the farther along into the trial the proposed animation was disclosed, the more likely it would be that the prejudicial effect would outweigh the probative value of the animation because the opposing party would have less time to examine it or prepare its own. *Commonwealth of Pennsylvania v. Serge*, 586 Pa. 671, 896 A.2d 1170 (Pa. 2006).

Simulations

Simulations are unlike animations in every respect other than that they are presented on a screen. They are usually submitted as substantive evidence, and as the basis of the reconstruction expert's opinion. Accident reconstruction experts commonly rely on computer programs specifically designed for the purpose of predicting what would occur in reality when the program is given specific parameters. The expert enters data based on actual evidence from the accident and allows the computer to perform mathematical calculations, the results of which show some aspects of the mechanics of the accident. Fault, possible extent of injuries, and vehicle defects can be determined

in this way. The expert would then adopt the computer's conclusions as the basis for his or her testimony.

While it has consistently been held that animations are not to be evaluated under the *Daubert* or *Frye* tests, since they are only demonstrative evidence that only illustrate an expert's opinion testimony, simulations are subject to either of those tests, depending on which one is followed by the state's courts. This heightened scrutiny for simulations exists since results of the simulation are usually submitted as substantive proof of a fact at issue. The court is therefore responsible for ensuring the testimony has some extent of reliability, when scientific methods are used to form the evidence. Simulation results fall within the category of results of experiments or tests for purposes of evidentiary standards they must meet.

901(b)(9) Fed. R. Evid. governs the authentication of a process such as a computer simulation program to ensure the reliability of the results presented in the expert's testimony. Many states which have adopted statutory codes of evidence use the federal *Daubert* standard to determine the admissibility of computer-generated accident simulations. Under the *Daubert* test, there are multiple factors that the judge, in a gatekeeper role, is to consider before allowing a simulation into evidence. *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579, 113 S. Ct. 2786 (U.S. Cal.1993).

Several factors that establish authentication under rule 901 of the Federal Rules of Evidence have been identified. "This standard can generally be satisfied by evidence that (1) the computer equipment is accepted in the field as standard and competent and was in good working order, (2) qualified computer operators were employed, (3) proper procedures were followed in connection with the input and output of information, (4) a reliable software program was utilized, (5) the equipment was programmed and operated correctly, and (6) the exhibit is properly identified as the output in question." *State v. Swinton*, 268 Conn. 781, 847 A.2d 921 (Conn. 2004).

In *Livingston v. Isuzu Motors, Ltd.*, the court held that a simulation program was properly authenticated under its strict application of the *Daubert* factors when the expert who developed and conducted the simulation touched upon each of the four factors in his testimony. As to whether the theory underlying the program was tested, he explained that the theory was based on commonly known physics equations. As to the second factor for peer review, he testified about presentations and lectures given to automobile engineers. Although he was unable to testify precisely about the rate of error of the program, which is the third factor, the court did not exclude the simulation in favor of allowing the opposing side to bring this information out on cross examination. The fourth factor, general acceptance in the scientific community, was satisfied by his identification of peers who had evaluated his work. *Livingston v. Isuzu Motors, Ltd.*, 910 F. Supp. 1473 (D. Mont. 1995).

In *Hinkle v. City of Clarksburg*, a computer simulation was excluded because the conditions of the test were not substantially similar, rendering the results of the test unreliable. The defendant "introduced a videotaped recreation of the accident that was conducted at a test facility on a flat, straight, asphalt surface in daylight by an experienced driver." However, the parties had previously agreed on the fact that "at the time of the accident it was night, and plaintiff was driving down a hill at a sharp curve in the road when he struck the utility pole." *Hinkle v. City of Clarksburg*, 81 F.3d 416, 1996.

In New York, results of tests are admissible as substantive evidence if the methods by which the results were produced meet the standard set forth in *Frye v. United States*. *Frye* held that an expert opinion based on a scientific technique is inadmissible unless the technique is "generally accepted" as reliable in the relevant scientific community. *Frye v. U.S.*, 54 App. D.C. 46, 293 F. 1013, 1014 C.A.D.C 1923.

The court in *Commercial Union Ins. Co. v. Boston Edison Co.* applied the *Frye* test to computer-generated simulations. It stated that "we treat computer-generated models or simulations like other scientific tests, and condition admissibility on a sufficient showing that (1) the computer is functioning properly; (2) the input and underlying equations are sufficiently complete and accurate (and disclosed to the opposing party, so that they may challenge them); and (3) the program is generally accepted by the appropriate community of scientists." The issue in that case was the opponent's objection to the third criteria. They contended that the relevant community of scientists were actual air conditioning and heating experts. The court rejected the argument that HVAC technicians are the measuring scientific community, and instead, it was held that the community to be used was that of accident reconstruction and other types of qualified engineers who regularly use simulation programs like the one at issue. *Commercial Union Ins. Co. v. Boston Edison Co.*, 412 Mass. 545, 591 N.E.2d 165 (Mass. 1992).

State v. Sipin applied the *Frye* test to computer-generated simulations as well. It held that simulations can be admitted as substantive proof when it is established that the computer is functioning properly, the data entered into the computer was accurate according to the evidence from the incident, and the program equations were accurate. On appeal, a new trial was ordered so that there could be a *Frye* hearing. The Appellate Division concluded that it was not proven that there was general acceptance in the community of accident reconstruction experts for the purpose for which the program at issue was used. Namely, "the use of the multi-body version of PC-CRASH to predict interior occupant movement in a multi-impact accident" was not shown to be generally accepted when the proponent provided "no validation studies that had been done on the use." *State v. Sipin*, 130 Wash. App. 403, 123 P.3d 862 (Wash. App. Div. 1, 2005).

As to procedural matters, the court in *State v. Sipin*, stated that any program relied on for the basis of an expert's opinion should be disclosed to the opposing side in advance of trial so that they can test its reliability and prepare cross examination questions for the expert who relied on it. However, non-disclosure prior to trial is not a ground to exclude an exhibit, if it is disclosed prior to its introduction, outside the presence of the jury. However, state laws differ on timing of this disclosure and careful examination should be made of the applicable state's law.

In *Deffinbaugh v. Ohio Turnpike*, the Ohio Court of Appeals found a sufficient foundation to support admissibility where the testifying expert testified (1) to the name of the program he used, (2) that the program offered an accurate depiction of the motion of the vehicle, and (3) that he used known facts and a reliable estimate of speed to generate the simulation and where the use of the computer simulation was disclosed pretrial. 588 N.E.2d. at 194.

In *Turner v. Williams*, the court stated that the plaintiffs' motion to exclude a reconstruction expert's testimony because he did not enter all the facts from deposition testimony was not a basis on which to exclude his testimony, because this issue could be addressed on cross examination. The admissibility of the simulation itself was not addressed. *Turner v. Williams*, 326 Ill. App.3d 541, 2001.

Bray v. Bi-State Development Corp. held that the reconstruction expert need not run the simulation program himself or herself, saying, "There is no general requirement that a testifying expert physically do this." The court found it sufficient that the reconstruction expert "supervised the process and supplied the data to be entered [and] testified he generally relied on the manufacturer's representative to actually run the program." *Bray v. Bi-State Development Corp.*, 949 S.W.2d 93 (Mo. App. E.D. 1997).

The court in *Zimmerman v. Powell* stated that "we abandoned the *Frye* test and, in its place, adopted the framework set forth in *Daubert*.... Under the *Daubert*... framework, the trial court acts as a gatekeeper to ensure the evidentiary relevance and reliability of an expert's opinion.... This entails a preliminary assessment whether the reasoning or methodology underlying the testimony is valid and whether that reasoning or methodology properly can be applied to the facts in issue.... The trial court must also determine if the witness has applied the methodology in a reliable manner." It further stated, "Once a party opposing an expert's testimony has sufficiently called into question the testimony's factual basis, data, principles, [or] methods, or their application...the trial judge must determine whether the testimony has a reliable basis in the knowledge and experience of the relevant discipline." Despite this very good outline of the *Daubert* test, the court did not perform one on the facts of the simulation because the record was not preserved on the issue, and any prejudice from that issue combined with

other errors was a reduction in damages. *Zimmerman v. Powell*, 268 Neb. 422, 684 N.W.2d 1 (Neb. 2004).

Lally v. Volkswagen Aktiengesellschaft addressed a simulation which was offered to show "the real time movement of the occupants in the crash, and the components with which they would likely have come into contact if the vehicle moved at a fifty-three degree angle," calculated by a reconstruction expert for purposes of comparing it to the damage on the actual car. It went on to say that the test for admissibility was "whether the evidence is relevant, the extent to which the test conditions are similar to the circumstances surrounding the accident, and whether the experiment...will confuse or mislead the jury." The court held the test result was relevant as to the defendant's theory of causation. It acknowledged that although the simulation did not precisely replicate the conditions of the accident, it was substantially similar for the purpose of the jury's understanding of "how the occupants would have moved inside the vehicle and what parts of the interior they would likely have struck if they moved in the direction posited by the defendants' experts." It stated that determining substantial similarity was a matter for the discretion of the court. *Lally v. Volkswagen Aktiengesellschaft*, 45 Mass. App. Ct. 317, 698 N.E.2d 28 (Mass. App. Ct. 1998).

Although the general rule is that a *Frye* or *Daubert* analysis must be done to determine the admissibility of a simulation, the analysis is not necessary when the proponent does not submit the simulation as substantive evidence. In *Lyons v. J.A. Auger, Inc.*, the court held that where an expert reconstructionist used a simulation only to test his theories, and the simulation was not entered as an exhibit as scientific proof of the cause of the accident, there was no need to test the foundation of the program other than according to the criteria of "reasonable reliance." 821 So.2d 536, (La. App. 2 Cir. 2002).

Conclusion

Using computerized animation or simulation in a catastrophic motor vehicle accident must be given serious consideration. An early comprehensive investigation to gather the raw data necessary to reconstruct the accident will ensure that as a proponent of the computerized animation or simulation the jury will get to see it.

Salvatore DeSantis, who has extensive trial experience, is a member of the firm Molod Spitz & DeSantis, P.C., whose areas of concentration are construction litigation, transportation and insurance coverage. Alice Spitz is also a member of the firm, as well as the president of The Harmonie Group, a national network of selectively chosen law firms that have the proven ability to serve the special needs of the defense and risk industry, and her areas of concentration are premises liability, transportation and environmental litigation. Ayesha Syed is a first-year associate of the firm, and her area of concentration is insurance coverage analysis.