The Use of Computer-Generated Animations and Simulations at Trial

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A computer is not a gimmick and the court should not be shy about its use, when proper. Computers are simply mechanical tools—receiving information and acting on instructions at lightning speed. When the results are useful, they should be accepted, when confusing, they should be rejected. What is important is that the presentation be relevant to a possible defense, that it fairly and accurately reflect the oral testimony offered and that it be an aid to the jury's understanding of the issue.[1]

[1] People v. McHugh, 476 N.Y.S.2d 721, 722–723 (N.Y. Sup. Ct. 1984).

INCREASINGLY, computer-generated animations and simulations are being used in courtrooms across the country. Although animations and simulations can assist jurors in understanding complex issues, they can also distract from and distort the facts of a case. In recognition of the power these new evidentiary tools can hold over jurors, courts have erected barriers to admission of this evidence in order to ensure that such evidence helps, more than it hurts, the fact-finder's search for the truth.

Courts first review the evidence to determine whether it is animation or

simulation, as standards for admissibility differ for each. Since expert testimony frequently provides the vehicle for animation and simulation admission, challenges to this evidence often should be made in the context of *Daubert* motion practice. Evidence of this type often is created in the latter stages of trial preparation, and therefore timeliness objections are frequently made (though they are rarely successful). Courts nearly always employ cautionary instructions that attempt to blunt the force of effective animations and simulations.

I. Animation or Simulation?

Computer-generated evidence can be categorized as demonstrative or substantive evidence, and the distinctions between the two are very important. Computer-generated "animations" are generally considered to be demonstrative evidence and can be thought of as visual aids used in support of witness testimony.[2] Their purpose is to help the jury understand a witness's testimony, and they do not purport to be scientific recreations of an actual event.[3] To the extent that animations do recreate events, they can only do so in furtherance of visually representing a witness's belief about what transpired.[4] An animation has only secondary relevance and "must rely on other material testimony for relevance."[5]

In contrast, simulations are considered substantive evidence and are computer-generated models or reconstructions based on scientific principles.[6] Simulations are created by entering data and engaging in computer-assisted analysis in accordance with widely accepted methodology.[7] Rather than depicting a witness's testimony in the manner of an animation, simulations form conclusions based on raw data: "In a simulation, data is entered into a computer which is programmed to analyze the information and perform calculations by applying mathematical models, laws of physics and other scientific principles in order to draw conclusions and recreate an incident."[8] In short, in the context of simulations, the computer itself is the expert.

II. Foundational Requirements

Whether computer-generated evidence is classified as an animation or a simulation has important practical implications, particularly as it relates to the evidentiary foundation required for its admission.[9]

Generally, animations are admissible if the usual foundational requirements ap-

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[2] People v. Cauley, 32 P.3d 602, 606-607 (Colo. Ct. App. 2001).

[3] Hinkle v. City of Clarksburg, 81 F.3d 416, 425 (4th Cir. 1996) (citing Datskow v. Teledyne Continental Motors Aircraft Prods., 826 F. Supp. 677, 686 (W.D.N.Y. 1993)).

[4] Id.

[5] Clark v. Cantrell, 529 S.E.2d 528, 535 (S.C. 2000).

[6] Clark, 529 S.E.2d at 535 n.2. See also Commonwealth v. Serge, 896 A.2d 1170, 1175 (Pa. 2006) (using the animation/simulation distinction).

[7] Harris v. State, 13 P.3d 489, 494 n.6 (Okla. Ct. Crim. App. 2000), cert. denied, 532 U.S. 1025, 121 S. Ct. 1971 (2001) (citing Kristin L. Fulcher, Comment, The Jury as Witness: Forensic Computer Animation Transports Jurors to the Scene of a Crime or Automobile Accident, 22 U. DAYTON L. REV. 55, 58 (1996)).

[8] Commonwealth v. Serge, 58 Pa. D & C.4th 52, 68 (C.P. Ct. Lackawanna County 2001).

[9] See, e.g., State v. Sayles, 662 N.W.2d 1, 9 (Iowa 2003).

plicable to other forms of demonstrative exhibits are met.[10] Usually, this means that the animation must be relevant, its probative value must outweigh its potential for unfair prejudice or confusion, and it is supported by testimony establishing that it accurately depicts that which it purports to depict.[11]

By contrast, as substantive evidence, simulations are subject to the same scrutiny as more traditional scientific tests. Accordingly, the simulation generally must pass the scientific evidence admissibility standards of the relevant jurisdiction.[12] The simulation's proponent must establish that the evidence is "based upon sufficient facts or data," that the facts and data upon which the simulation is based "are of a type reasonably relied upon by experts in the particular field," that the simulation is "the product of reliable principles and methods," and that the supporting expert witness "applied principles and methods reliably" when creating or using the simulation.[13]

III. Objections

Courts recognize that computer-generated animations and simulations are powerful evidentiary tools that have the potential to mislead a jury if they inaccurately portray events. In a society enthralled by cutting-edge technology, the danger that juries will give undue weight to computer-generated evidence over less-glamorous forms of evidence is very real. Parties opposing the use of such evidence should think carefully about how to craft their objections to computer-generated exhibits, and proponents of the same evidence should craft these animations and simulations as early as possible in their preparation for trial so that they are well equipped to parry objections from opposing counsel.

The most common objection to computer-generated evidence seems to be that the proponent of the evidence failed to disclose it within a reasonable time before trial.[14] A "reasonable time" has been defined as enough time to allow the opposing party to inspect the evidence and determine possible objections, and two weeks prior to trial has been held to be a sufficiently timely disclosure.[15]

On its own, a party's late production generally is insufficient to warrant its preclusion. When deciding on a timeliness objection to computer-based evidence,

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[10] *See, e.g., Clark,* 529 S.E.2d at 536 (holding that a computer-generated animation is admissible as demonstrative evidence when the proponent meets the standard South Carolina foundational requirements that a demonstrative exhibit be authentic, relevant, fair and accurate, and not substantially prejudicial).

[11] *See, e.g.,* FED. R. EVID. 401 (relevant evidence must have a "tendency to make the existence of any fact that is of consequence to the determination of the action more probable or less probable"); FED. R. EVID. 403 ("[a]lthough relevant, evidence may be excluded if its probative value is substantially outweighed by the danger of unfair prejudice, confusion of the issues, or misleading the jury, or by considerations of undue delay, waste of time, or needless presentation of cumulative evidence"); and FED. R. EVID. 901(a) (a demonstrative exhibit is authenticated by "evidence sufficient to support a finding that the matter in question is what its proponent claims").

[12] See Alice B. Lustre, Annotation, *Post-Daubert Standards for Admissibility of Scientific and Other Expert Evidence in State Courts,* 90 A.L.R. 5th 453 (2001).

[13] FED. R. CIV. P. 702, 703.

[14] *Clark,* 339 S.C. at 384-385, 529 S.E.2d at 536 (citations omitted).

[15] *Id.*

courts primarily look to the prejudice attributed to the delay that is suffered by the moving party.[16] Importantly, a party must do more than simply claim to be prejudiced, but instead must actually demonstrate the prejudice has or will occur.[17]

IV. Cautionary Instructions

In order to prevent unfair prejudice, courts have encouraged—and in some cases, required—that cautionary instructions be given to the jury regarding the nature of the animation or simulation, as well as the weight it should be afforded.[18] Requests for a limiting or cautionary instruction are nearly always granted and, in many jurisdictions, recommended by appellate courts.[19]

Cautionary instructions generally include the following elements: (1) an admonition that the jury is not to give the animation or simulation more weight just because it comes from a computer; (2) a statement clarifying that the exhibit is based on the supporting witness's evaluation of the evidence; and, (3) in the case of an animation, a statement that the evidence is not meant to be an exact recreation of the event, but is, instead, a representation of the witness's testimony.[20]

Due to concerns that animations and simulations can be given undue weight by juries, a majority of courts have held that computer-generated animations used only as demonstrative exhibits should not be provided to juries during their deliberations.[21] On the other hand, some courts have allowed animation evidence to be viewed by the jury during deliberations.[22]

V. Federal and State Survey

The following does not purport to be an exhaustive survey of case law on this subject. However, the below circuits and states have addressed at least some of the issues relating to the use of computer-generated animations and simulations. Although requirements may differ slightly by jurisdiction, the general principles discussed above inform the analyses of all courts.

First Circuit

Courts will allow the admission of computer animations "if authenticated by testimony of a witness with personal knowledge of the content of the animation, upon a showing that it fairly and adequately portrays the facts and that it will help to

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[16] Friend v. Time Mfg. Co., Civ. No. 03-343, 2006 U.S. Dist. LEXIS 52790, *16–17 (D. Ariz. 2006) (citing Wendt v. Host Intern, Inc., 125 F.3d 806, 814 (9th Cir. 1997)).

[17] *Id.*

[18] *See, e.g., Clark,* 529 S.E.2d at 537 (encouraging the trial court to give a cautionary instruction that the animation at issue represents only a recreation of the proponent's version of the event and may be accepted or rejected in whole or in part).

[19] *See, e.g., Hinkle,* 81 F.3d at 425; *Cauley,* 32 P.2d at 607.

[20] *See, e.g., Hinkle,* 81 F.3d at 425; *Cauley,* 32 P.2d at 607.

[21] *See, e.g., Harris,* 13 P.3d at 495 (holding that computer-generated animations should not have been made available to the jury during deliberations because they had no independent evidentiary value).

[22] *See Clark,* 529 S.E.2d at 535.

illustrate the testimony given in the case."[23] To be admissible, computer animations must be authenticated by independent evidence or be self-authenticating.[24] The *Insight Tech* court excluded the defendant's expert's affidavit, which contained an explanation of computer animations, on the basis that the explanations constituted expert opinion that the defendant did not properly disclose. The court also excluded the animations because without the expert's explanations, the animations were "unauthenticated drawings of unidentified devices."[25]

Second Circuit

A party that utilizes demonstrative evidence in the form of video simulations or computer-generated animations to illustrate a witness' testimony must take care to inform the jury that the video offered is not a re-creation of the event being depicted, but is instead "computer pictures" to help them understand the witness's opinion.[26] In contrast, if a party offers computer-generated evidence that purports to actually recreate the event, the evidence must "possess [] a high degree of similarity" to the original event.[27] Not surprisingly, "[t]ests or experiments that

merely illustrate a theory or scientific principle are not required to possess as high a degree of similarity to the actual event as are purported re-creations of the event."[28]

Third Circuit

Computer-generated simulations, reconstruction, and animation "have long been accepted as an appropriate means to communicate complex issues to a lay audience, so long as the expert's testimony indicates that the processes and calculations underlying the reconstruction or simulation are reliable."[29]

Some district courts in the Third Circuit have expressed a preference for such evidence if it helps a jury understand and visualize the facts at issue in the case before them. For example, in *Altman v. Bobcat Co.*,[30] the plaintiffs offered an animation to show how a person seated in the backhoe at issue in the case could come within contact of the controls that operated the machine's swing arm.[31] The defendant objected to the animation, arguing that it was improperly authenticated, not scientifically reliable, and that the judge improperly failed to consider the animation's possible prejudicial effect.[32]

The *Altman* court noted that the First Circuit had cautioned that computer-generated recreations "could easily seem to resemble the actual occurrence" and

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[23] Insight Tech., Inc. v. Surefire, LLC, 2007 U.S. Dist. LEXIS 83632, at *7 (D.N.H. Nov. 01, 2007) (quoting Lorraine v. Markel Am. Ins. Co., 241 F.R.D. 534, 559 (D. Md. 2007)).

[24] *Insight Tech*, at *3.

[25] *Id.*

[26] Datskow v. Teledyne Continental Motors Aircraft Prods., 826 F. Supp. 677, 685 (W.D.N.Y. 1993).

[27] *Id.* (citing Roland v. Langlois, 945 F.2d 956, 963 (7th Cir. 1991); Champeau v. Fruehauf Corp., 814 F.2d 1271, 1278 (8th Cir. 1987)).

[28] *Id.* at 687.

[29] Ortiz v. Yale Materials Handling Corp., 2005 U.S. Dist. LEXIS 18424, at *28-29, (D. N.J. Aug. 24, 2005).

[30] 2008 U.S. Dist. LEXIS 55024, at *7 (W.D. Pa. July 14, 2008).

[31] *Id.*

[32] *Id.* at *6.

therefore mislead jury members "because they do not fully appreciate how variations in the surrounding conditions, as between the original occurrence and the staged event, can alter the outcome," but concluded that the evidence offered by plaintiffs was allowable because they "did not offer the computer-generated evidence as a reconstruction of the accident, but rather, offered it to help the jury visualize the testimony proffered by their witnesses."[33] On appeal, the Third Circuit affirmed, holding that the "depiction evidence" offered by the plaintiffs "was not 'sufficiently close in appearance to the original accident to create the risk of misunderstanding by the jury' or prejudice to Bobcat."[34]

Fourth Circuit

Computer-generation animations are admissible in the Fourth Circuit, but proffering parties are cautioned that the jury will be instructed as to the distinctions between evidence that illustrates a witness's evaluation of an event, as opposed to a recreation of the event itself. For example, in *Hinkle v. City of Clarksburg*,[35] the Fourth Circuit affirmed the district court's decision to permit the defense expert's computer-animated video that recreated the shooting scene at the heart of the case. In so doing, the court acknowledged the power of such evidence, but concluded that so long as the jury was properly informed as to the nature of the video—

i.e., that the animation was not intended to be a recreation of events, but rather the illustration of an expert's opinion as to those events—then the evidence should be admitted and the opposing party's concern that the video would be unduly prejudicial was unfounded.[36]

Fifth Circuit

The District Court for the Southern District of Texas found a computer-generated animation recreating an accident on a docked ship was admissible in support of a properly qualified liability expert's testimony.[37] The court found the animation to be admissible based on the expert's testimony that it was accurate and "to scale, based on the vessel's plans, witness testimony, Houston Police Department reports, and the Coroner's reports."[38] The court also found that the probative value of the animation "clearly" outweighed its potential inflammatory effect on the jury.[39]

Sixth Circuit

From time to time, a computer-generated animation may depict so powerfully one party's view of an event under dispute that no curative instructions will suffice to save the opposing party from undue prejudice. For example, in *Dugle v. Norfolk Southern Ry.*, the plaintiff deputy sheriff was sitting in his police cruiser when he was struck by a Norfolk train at a railroad crossing, and suffered permanent

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[33] *Id.* at *7-8 (quoting Fusco v. General Motors Corp., 11 F.3d 259 (1st Cir. 1993)).

[34] Altman v. Bobcat Co., 349 Fed. Appx. 758, 764 (3rd Cir. 2009) (quoting *Fusco*, 11 F.3d at 264).

[35] 81 F.3d at 424.

[36] *Id.* at 425.

[37] Ponce v. M/V Altair, 493 F. Supp.2d 880, 885 (S.D. Tex. 2007).

[38] *Id.*

[39] *Id.*

impairment.[40] The plaintiff's expert offered a computer-generated animation that recreated the collision from the plaintiff's point of view.[41] Although the plaintiff argued that the animation was an illustration of his expert's opinions of the plaintiff's head movements at the time of the accident and not a recreation of the accident itself, the court ultimately determined that the "animations are 'sufficiently close in appearance to the original accident to create the risk of misunderstanding by the jury,' thus requiring that the animations be substantially similar to the actual conditions."[42] Furthermore, the court concluded that "the animations are vivid and are not themselves subject to cross-examination. [. . .] They could very well create an indelible impression in the jury of what Deputy Dugle saw in the seconds leading up to the collision. The risk of such an impression is too great …."[43] Accordingly, the computer-generated animations were excluded.

Seventh Circuit

The distinction between computer-generated evidence being offered for demonstrative/illustrative purposes or as substantive evidence is often the difference that determines whether or not the evidence will be admitted. In the Northern District of Illinois, the plaintiff offered a computer-generated video as demonstrative evidence and the defense opposed the same because it claimed, among other points, that the plaintiff's video improperly conflated two different printing press models and exaggerated the printing problems that were at the heart of the case.[44] The plaintiff made minor edits to its video in response to the defendant's complaints, but ultimately countered that "the videotape [would] greatly assist the jury and argue[d] that the tape need not strictly adhere to reality because it [was] being used for illustrative purposes."[45] The court agreed, and the computer-generated evidence was admitted.[46]

Eighth Circuit

In the Eastern District of Arkansas, computer-generated animation was allowed to illustrate the non-expert testimony of a group of witnesses to plaintiff's alleged accident with one of the defendant's shipping vehicles.[47] In *Swift*, the plaintiff suffered a brain injury when he swerved to avoid a head-on collision with the defendant's 18-wheeler.[48] Although the plaintiff did not remember the events immediately after the collision and could not testify to them at trial, a number of witnesses that arrived at the scene after the accident testified that the plaintiff had identified the oncoming 18-wheeler as belonging to defendant's company and marked with its logo.[49] Accordingly, the

[40] 2010 U.S. Dist. LEXIS 63296, at *2 (E.D. Ky. June 25, 2010).

[41] *Id.* at *6.

[42] *Id.* (quoting *Fusco*, 11 F.3d at 264).

[43] *Id.* at 7.

[44] Rockwell Graphic Systems, Inc. v. Dev. Industries, Inc., 1992 U.S. Dist. LEXIS 16938, at *1 (N.D. Ill. Nov. 3, 1992).

[45] *Id.*

[46] *Id.* at *2.

[47] Swift Transp. Co. of Arizona, LLC v. Angulo, 2012 U.S. Dist. LEXIS 1161, at *16 (E.D. Ark. 2012).

[48] *Id.* at *8.

[49] *Id.* at *8-10.

plaintiff presented video animation to the jury that depicted the inside of the plaintiff's vehicle and was shot as if over the driver's shoulder of the driver. The animation showed an eighteen-wheeler driving straight toward the plaintiff's truck, with the "Swift" logo clearly visible.[50] Swift argued the computer-generated video lacked foundation and evidentiary support, that it was based on speculation, and that it would improperly taint the jury's perception of the accident scene.[51] The Court concluded, however, that "the trial judge did not abuse his discretion in admitting the computer generated animation as it was relevant, based on testimony of a number of witnesses as well as other primary evidence, and assisted the jury in understanding the testimony."[52]

Ninth Circuit

Courts in the Ninth Circuit apply the usual standards for demonstrative evidence to computer-generated animations.[53] "At a minimum, the animation's proponent must show the computer simulation fairly and accurately depicts what it represents, whether through the computer expert who prepared it or some other witness who is qualified to so testify, and the opposing party must be afforded an opportunity for cross-examination."[54]

Tenth Circuit

The Tenth Circuit has cautioned district courts to "carefully and meticulously make an early pretrial evaluation of issues of admissibility, particularly of scientific expert opinions and films or animations illustrative of such opinions."[55] The court expressed concern that "not only is the danger that the jury may confuse art with reality particularly great, but the impressions generated by the evidence may prove particularly difficult to limit."[56] Accordingly, the court recommends that a cautionary instruction from the court should accompany a party's computer-generated animation evidence, clarifying the purpose of the evidence and the fact that it is being used for demonstrative purposes only.[57]

Rollover testing such as spit testing is relevant and admissible to demonstrate general scientific principles of occupant kinematics in rollover accidents.[58] In *Harvey*, the plaintiff sustained severe bodily injuries resulting in brain damages and a leg amputation in a high speed, single vehicle rollover accident involving a 1979 Chevrolet Corvette.[59] The plaintiff sued General Motors Corp. (GM) arguing

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[50] *Id.* at *10–11.

[51] *Id.* at *16.

[52] *Id.*

[53] *See, e.g.*, Byrd v. Guess, 137 F.3d 1126 (9th Cir. 1998).

[54] Friend v. Time Mfg. Co., 2006 U.S. Dist. LEXIS 52790, at *20 (D.C. Az. July 28, 2006) (quoting Bledsoe v. Salt River Valley Water

Users' Assoc., 880 P.2d 689, 692 (Ct. App. 1994)).

[55] Robinson v. Mo. Pac. R.R. Co., 16 F.3d 1083, 1089 (10th Cir. 1994).

[56] *Id.* at 1088 (quoting 2 McCormick on Evidence 19 (4th ed. 1992) (footnote omitted)).

[57] *Id.* at 1087.

[58] Harvey v. General Motors Corp., 873 F.2d 1343, 1355-1356 (10th Cir. 1989).

[59] *Id.* at 1345.

the vehicle was defective because the Corvette's T-Top roof panels separated from the vehicle during the rollover accident. The plaintiff, who was not wearing his seat belt, was ejected from the vehicle.[60]

During trial, the trial court admitted GM's expert's testimony regarding videos of rollover testing as "a scientific study by [GM's expert] relating to general principles of occupant motion, or kinematics, in rollover accidents."[61] The Tenth Circuit Court of Appeals affirmed the trial court's ruling allowing the rollover tests.[62] The Tenth Circuit observed that the rollover crash tests were "introduced to assist the jury in understanding the expert's relevant testimony."[63] The rollover tests were not introduced to recreate the accident and the trial court gave an appropriate limiting instruction. Consequently, the trial court did not err in admitting the videos of the expert's rollover tests.[64]

Eleventh Circuit

Discussing Florida state law, the Eleventh Circuit indicated that for a court to admit computer-generated animation, "the proponent must establish that '(1) the opinion evidence [is] helpful to the trier of fact; (2) the witness [is] qualified as an expert; (3) the opinion evidence [is] applied to evidence offered at trial; and (4) . . . the evidence, although technically relevant, [does] not present a substantial danger of unfair prejudice that outweighs its probative val-

ue.'"[65] Furthermore, "[t]he proponent must also 'establish that the facts or data on which the expert relied in forming the opinion expressed by the computer animation are of a type reasonably relied upon by experts in the subject area,' and that 'the computer animation [is] a fair and accurate depiction of that which it purports to be.'"[66]

Alabama

In Alabama, computer-generated animations that illustrate an expert's testimony are admissible.[67] The expert must first be qualified, and the animation must be based on admissible evidence.[68]

Arizona

Arizona courts have held that the evidentiary use of computer-generated animations and simulations is generally permissible.[69] However, the proponent of such evidence must satisfy the usual foundational requirements for demonstrative exhibits are met, by showing "that the computer simulation fairly and accurately depicts what it represents."[70] Additionally, the opposing party must be afforded the opportunity for cross-examination.[71] In

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[60] *Id.*

[61] *Id.* at 1355.

[62] *Id.*

[63] *Id.* at 1356.

[64] *Id.*

[65] Ramos v. Sec'y, Fla. Dep't of Corr., 441 Fed. Appx. 689, 694 n. 2 (11th Cir. 2011) (quoting Pierce v. State, 718 So. 2d 806, 809 (Fla. Dist. Ct. App. 1997) (citation omitted)).

[66] *Id.* (quoting *Pierce*, 718 So. 2d at 809).

[67] Tillis Trucking Co. v. Moses, 748 So. 2d 874, 881 (Ala. 1999).

[68] *Id.*

[69] Bledsoe v. Salt River Valley Water Users' Assoc., 179 Ariz. 469, 472 (Ariz. Ct. App. 1994).

[70] *Id.*

[71] *Id.*

the *Bledsoe* case, the animation at issue was excluded because the expert whose opinion the animation illustrated never testified and the defendant had no opportunity to cross-examine him.[72]

Arkansas

Often, courts will determine the admissibility of computer-generated evidence using the broader framework established by the rules of evidence. In *Peterrie Transp. v. Thurmond*, the Arkansas Court of Appeals affirmed the trial court's decision to allow the plaintiff's expert to show the jury an animated video depicting the effects of a rear-end collision on the neck of an unsuspecting driver.[73] Although the opposing party objected to the video on the grounds that a proper foundation had not been laid before its introduction, the court relied on Rule 901(a) of the Arkansas Rules of Evidence to find that the expert's testimony was sufficient to lay the foundation for this evidence, when the evidence was offered "to illustrate to the jury the mechanics of a rear-end collision injury," rather than to recreate the original events of the accident itself.[74]

California

The Supreme Court of California distinguishes between computer animations and computer simulations. In *People v. Duenas,* the California Supreme Court noted that "[a]nimation is merely used to illustrate an expert's testimony, while simulations contain scientific or physical principles requiring validation. Animations do not draw conclusions; they attempt to recreate a scene or process, thus they are treated like demonstrative aids."[75] The court concluded that animations are admissible if they fairly and accurately represent the evidence to which they relate, but that simulations are admissible "only after a preliminary showing that 'any new scientific technique' used to develop the simulation has gained general acceptance . . . in the relevant scientific community."[76]

Colorado

Colorado's appellate courts also note the distinction between computer-generated animations, which are based on witness testimony and used as demonstrative evidence, and computer-generated simulations, which are based on the application of scientific principles.[77] A computer animation is admissible as demonstrative evidence if its proponent shows (1) that it is authentic under Rule 901 of the Colorado Rules of Evidence ("CRE"); (2) that it is relevant under CRE Rules 401 and 402; (3) that it is a fair and accurate representation of the evidence to which it relates; and, (4) that its probative value is not substantially outweighed by the danger of unfair prejudice.[78] Under the standard foundational requirements for demonstrative exhibits, the court held that an animation is authenticated if there is evidence to support a finding that the

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[72] *Id.*

[73] 79 Ark. App. 375, 379-380 (Ark. Ct. App. 2002).

[74] *Id.* at 380.

[75] 281 P.3d 887, 900 (Cal. 2012) (quoting *Harris*, 13 P.3d at 494 n. 6 (internal citations omitted)).

[76] *Id.* at 901 (internal citations omitted).

[77] *Cauley*, 32 P.3d at 607.

[78] *Id.*

evidence is what the proponent claims it is.[79] It does not appear that a limiting instruction by the trial court is required, but the Colorado Court of Appeals encourages it.[80]

Connecticut

Connecticut examines six factors to establish authentication of computer-generated evidence: (1) that the computer equipment utilized to generate the evidence is accepted in the field as standard and competent and was in good working order; (2) that qualified computer operators were employed; (3) that proper procedures were followed in connection with the input and output of information; (4) that a reliable software program was utilized; (5) that the equipment was programmed and operated correctly; and (6) that the exhibit is properly identified as the output in question.[81]

Florida

In *Pierce v. State* the Florida Court of Appeals held that, in order to admit an animation as a demonstrative exhibit, illustrating an expert's opinion, the proponent must first establish the foundational requirements necessary to introduce an expert opinion.[82]

Specifically, (1) the opinion evidence must be helpful to the trier of fact; (2) the witness must be qualified as an expert; (3) the opinion evidence must

be applied to evidence offered at trial; and (4) . . . the evidence, although technically relevant, must not present a substantial danger of unfair prejudice that outweighs its probative value.[83]

The proponent must also establish that the facts or data on which the expert relied in forming the opinion expressed by the animation are of a type reasonably relied upon by experts in the subject area.[84] Finally, the animation must be "a fair and accurate depiction of the expert's opinion as to how the [event represented] occurred" and "helpful to the jury in understanding the issues in the case."[85] Note, however, that, even if the animation is admitted in evidence, it is not permitted in the jury room for deliberations.[86]

Georgia

In Georgia, computer-generated animations are admissible if they fairly and accurately represent the scene sought to be depicted.[87] By contrast, animations that are presented to the jury as reenactments must be "substantially similar" to the evidence introduced at trial.[88]

Hawaii

In *Cabral v. State*, the plaintiff objected to the defendant's use of a video animation depicting the defense's opinion of the

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[79] *Id.* (citing COLO. R. EVID. 901).

[80] *Id.*

[81] State v. Swinton, 847 A.2d 921, 942 (Conn. 2004).

[82] 718 So. 2d 806, 809 (Fla. Ct. App. 1997).

[83] *Id.* (internal citations omitted).

[84] *Id.*

[85] *Id.*

[86] Campoamor v. Brandon Pest Control, Inc., 721 So. 2d 333, 335 (Fla. Ct. App. 1998).

[87] Cleveland v. Bryant, 512 S.E.2d 360, 362 (Ga. Ct. App. 1999).

[88] *Id.*

accident that was at the heart of the conflict between the parties.[89] The plaintiff argued that the animation was inadmissible hearsay, but the court disagreed, since the animation was not offered "for the truth of the matter asserted but as a visual depiction of the State's theory of the case."[90]

Idaho

In Idaho, the standard applied to computer-generated evidence that is offered as illustrative evidence is not accuracy, but rather whether the evidence is relevant to the witness's testimony.[91] In *Stevens*, the defendant objected to the State's admission of video animation depicting the State's expert's theory that a fall down the stairs could not have caused the death of the child for whose murder Stevens stood accused.[92] Specifically, Stevens argued that the State's video animation was irrelevant because it did not accurately depict the falling of a child down the stairs.[93] The Supreme Court noted that this argument presupposed that the animation was exhibited as substantive, rather than illustrative, evidence, and that the video was both relevant and admissible, as it was used to illustrate the testimony of the State's expert witness.[94]

Illinois

In *Hudson v. City of Chicago,* the Illinois Appellate Court held that the trial court did not err when it allowed the plaintiff's expert to show a computer simulation of the vehicle collision in question because the simulation was sufficiently based on data from the record.[95]

Indiana

Although Indiana's Court of Appeals has addressed the use of computer-generated animations, it has not set out foundational requirements. In *Stamper v. Hyundai Motor Co.,* the Court of Appeals of Indiana held that an animation prepared to illustrate the opinions of an expert witness who was not present at trial was inadmissible.[96] Because the animation lacked the foundation of expert testimony at trial, and because the defendant had no opportunity to cross-examine the expert, the court held that the evidence was properly excluded.[97]

Iowa

According to the Supreme Court of Iowa, computer-generated animations are admissible if they are authenticated in accordance with IOWA R. EVID. 5.901.[98] However, a witness who authenticates demonstrative evidence "need only know about the facts represented or the scene or objects photographed, and once this

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[89] 284 P.3d 221 (Haw. Ct. App. 2012).

[90] *Id.*

[91] State v. Stevens, 191 P.3d 217, 221 (Idaho 2008) (citing State v. Raudebaugh, 864 P.2d 596, 602 (1993)).

[92] *Id.* at 220.

[93] *Id.* at 221.

[94] *Id.* at 221-222.

[95] 881 N.E.2d 430, 454-455 (Ill. App. Ct. 2007).

[96] 699 N.E.2d 678, 684 (Ind. Ct. App. 1998).

[97] *Id.*

[98] *Sayles*, 662 N.W.2d at 8.

knowledge is shown he can say whether the [exhibit] correctly and adequately portrays these facts."[99]

Kansas

Although Kansas courts have not discussed the admissibility requirements for a computer-generated animation or simulation in a discovered case, at least one Kansas court has admitted a "computer-animated simulation."[100]

Kentucky

In *Gosser v. Commonwealth*, the Kentucky Supreme Court addressed the standard for admissibility of computer-generated animations.[101] The court stated that an animation is analyzed in the same manner as a static drawing or photograph under the rules of evidence.[102] Additionally, its admission does not depend on testimony as to how it was prepared unless it purports to contain exact measurements or other data.[103]

Louisiana

In *Constans v. Choctaw Transport, Inc.*, the Louisiana Court of Appeals contrasted computer-generated animations and simulations.[104] Noting an earlier case in which

a simulation was properly excluded, the court described a simulation as the computer using software to "theoretically apply[] the laws of physics in an attempt to realistically recreate the accident" so that the "computer functions in a sense as an expert itself."[105] An animation, by contrast, "is not clothed in the exaggerated aura of computer infallibility."[106] In *Contans*, the animation was not overly prominent in the jury's mind so its admission was not an abuse of discretion.[107] Additionally, the Louisiana Court of Appeals has found no error in the admission of an illustrative animation where the plaintiff had ample opportunity to cross-examine the expert whose opinion it depicted.[108]

In *State v. Harvey*, the Court of Appeals held that a computer generated reenactment must be identical or very similar to what it purports to portray in order to be admissible.[109] The closer a re-creation is to the scene depicted, the greater its probative value and thus, the greater its likelihood of admissibility.[110] Slight variations between a visual aid and video footage, however, do not make a visual aid inadmissible.[111]

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[99] *Id.* (internal quotations omitted).

[100] State v. Lockett, 2000 Kan. App. Unpub. LEXIS 542, at *8 (Kan. Ct. App. July 14, 2000) (finding no error in the admission of a "computer-animated simulation" of a crash as illustrative evidence).

[101] 31 S.W.3d 897, 901-903 (Ky. 2000).

[102] *Id.* at 903.

[103] *Id.*

[104] 712 So. 2d 885, 901 (La. Ct. App. 1997).

[105] Citing Pino v. Gauthier, 633 So. 2d 638 (La. Ct. App. 1993).

[106] *Id.*

[107] *Id.*

[108] Howell v. Union Pac. R.R. Co., 980 So. 2d 854, 859 (La. Ct. App. 2008).

[109] 649 So. 2d 783, 788 (La. Ct. App. 1995).

[110] *Id.*

[111] State v. Robbins, 986 So. 2d 828, 832 (La Ct. App. 2008).

Massachusetts

Massachusetts permits the admission of computer-generated simulations, provided the foundational requirements for scientific tests are met.[112] The following three features must be met for admissibility: "(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."[113]

The Massachusetts Court of Appeals has addressed the use of computer-aided design software, noting that a simulation "remains by definition merely a tool whose accuracy can be no greater than that of the data and assumptions on which it relies" and is not "unshaken documentary proof."[114]

Michigan

Michigan courts have distinguished between evidence offered to recreate an event and that not offered as a re-creation, but to illustrate an expert's opinion.[115] For both uses, the evidence must aid the fact finder, be relevant, and be probative.[116] For evidence used merely as an illustration of the expert's opinion, the exact circumstances of the event need not be recreat-

ed.[117] In *People v. Unger*, the court permitted certain computer animations of a victim's fall, which were based on the expert's calculations, but disallowed others that were based on calculations and the expert's speculation.[118] The court reasoned that the basis of the expert's opinion for the latter set of animations was not in evidence as required by Michigan Rule of Evidence 702, and the animation was irrelevant to the trial.[119]

Minnesota

The standard for admissibility of demonstrative exhibits is identical to that for computer-generated animations in Minnesota.[120] An animation must be "relevant and accurate and assist[] the jury in understanding the testimony of a witness" in order to be admissible.[121] But "[b]ecause of its dramatic power, proposed animations must be carefully scrutinized for proper foundation, relevancy, accuracy, and the potential for undue prejudice."[122] For example, if the animation does not accurately reflect the witness's testimony, then its admission will be deemed error.[123] Additionally, a cautionary instruction should be given prior to presenting the animation to a jury.[124]

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[112] Commercial Union Ins. Co. v. Boston Edison Co., 591 N.E.2d 165, 168 (Mass. 1992).

[113] *Id.*

[114] Commonwealth v. Caruso, 4 N.E.3d 1283, 1290 (2014).

[115] People v. Bulmer, 662 N.W.2d 117, 119 (Mich. Ct. App. 2003).

[116] *Id.*

[117] *Id.*

[118] 749 N.W.2d 272, 299 (Mich. Ct. App. 2008).

[119] *Id.*

[120] Ramsay Cnty. v. Stewart, 643 N.W.2d 281, 293 (Minn. 2002).

[121] *Id.*

[122] *Id.*

[123] *Id.* at 295.

[124] *Id.* at 296.

Mississippi

In *Cox v. State*, the Supreme Court of Mississippi, held that a computer animation must be "based on actual, physical measurements;" otherwise, it was mere speculation.[125] The court further explained that the animation "*must* be based on scientific, identifiable, and objective facts."[126] Additionally, an animation offered as demonstrative evidence should not be provided to the jury during deliberations.[127] Applying this standard, the Mississippi Supreme Court has held that "speculative 'expert' opinions" based on simulation of the relevant events are inadmissible.[128]

Missouri

The Missouri Supreme Court has categorized computer simulations as experimental evidence which are "admissible only if the experiment is made under substantially similar conditions to those at the time of the accident, although the conditions need not be identical."[129] In *Richardson*, the trial court excluded the simulation because there were too many "variables," and the Supreme Court affirmed.[130]

The determination of whether a proper foundation has been established is within the discretion of the trial court.[131] For more specific guidelines, however, Missouri has looked to the decisions of other courts, particularly using the three-prong test utilized by Massachusetts in *Commercial Union* as a starting point.[132]

Montana

The Montana Supreme Court considers whether computer simulations are based on scientific and mathematic principles and created with software that is widely accepted.[133] In *Wheaton*, an accident reconstruction with these characteristics had the sufficient factual background and reliability for admissibility.[134]

Nebraska

Nebraska employs the *Commerical Union* three-prong test for the admissibility of computer simulations: "(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."[135] Applying these elements, the Nebraska Supreme Court found that an accident reconstruction was admissible.[136]

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[125] 849 So. 2d 1257, 1273 (Miss. 2003).

[126] *Id.*

[127] *Id.* at 1274.

[128] Parvin v. State, 113 So. 3d 1243, 1251 (Miss. 2013).

[129] Richardson v. State Highway & Transp. Comm'n, 863 S.W.2d 876, 882 (Mo. 1993).

[130] *Id.*

[131] Bray v. Bi-State Dev. Corp., 949 S.W.2d 93, 97-98 (Mo. Ct. App. 1997).

[132] Id.

[133] Wheaton v. Bradford, 300 P.3d 1162, 1166 (Mont. 2013).

[134] *Id.*

[135] Kudlacek v. Fiat S.p.A., 509 N.W.2d 603, 617 (Neb. 1994) (quoting 591 N.E.2d 165).

[136] *Id.* at 618.

New Hampshire

The New Hampshire Supreme Court has excluded computer-generated animation when there was no evidence substantiating its factual basis and it did not contribute anything additional to the evidence before the jury.[137] Because the animation was not more than an illustration of the defendant's expert testimony which included diagrams, the defendant failed to meet his burden of proving prejudice in its exclusion.[138] The question of admissibility is within the discretion of the trial court, and there was no abuse of discretion in *Dodds*.[139]

New Jersey

New Jersey has applied its standard for admissibility of event reconstruction to computer animations of the relevant event.[140] Noting the particular danger of the jury placing undue weight on a reconstructive video and accompanying expert testimony, the court stated: "[a] motion picture of a reconstruction of a particular event may be admitted into evidence when relevant and where its probative value is not offset by undue prejudice, unfair surprise, undue consumption of trial time, or possible confusion of issues due to the introduction of collateral matters."[141] In *Persley*, the admissible video was "substantially similar to the subject accident"; the process leading to its creation was known to the jury; and it had a basis in the evidence which did not incorporate a testimonial component.[142] Each of these aspects made it distinguishable from other cases where the video was not admissible.[143]

New Mexico

New Mexico has defined computer-generated images as demonstrative evidence.[144] In *Tollardo*, the State attempted to categorize the image as an animation, as something used to illustrate the expert's opinion.[145] The expert, however, also used the image to help form his opinion, and thus the court applied the New Mexico standard for admissibility of an expert opinion.[146]

New York

New York has permitted animation meant to recreate the event if it is offered by a qualified expert who testifies establishing the animation's accuracy.[147]

In New York, it is error to permit a computer-generated animation to be played for the jury if the foundation is not properly laid and if the circumstances portrayed in the animation are "sufficiently different from those which existed at the time of the accident to render its utility questionable in light of the high potential

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[137] State v. Dodds, 982 A.2d 377, 387 (N.H. 2009).

[138] *Id*.

[139] *Id*.

[140] *See* Persley v. N.J. Transit Bus Operations, 813 A.2d 1219, 1228 (N.J. Super. Ct. App. Div. 1 2003).

[141] *Id*.

[142] *Id*. at 1229.

[143] *Id*.

[144] State v. Tollardo, 77 P.3d 1023, 1027 (N.M. Ct. App. 2003).

[145] *Id*. at 1028.

[146] *Id*. at 1029.

[147] *McHugh,* 476 N.Y.S.2d at 722.

for prejudice inherent in allowing the jury to view it."[148] Additionally, the court should instruct the jury on the animation's limited purpose of illustrating the expert's opinion as to the cause of the accident, and the jury should not "consider the computer-generated animation itself in determining what actually caused the accident."[149]

North Dakota

North Dakota has not directly addressed the question of admissibility of a computer-generated animation or simulation in a discovered case, but North Dakota courts have admitted evidence created by or modified by a computer.[150]

Ohio

Ohio courts have admitted animated reenactments into evidence on several occasions, though without a thorough discussion of their admissibility.[151] The admission of relevant evidence is within the discretion of the trial court, and concerns about inconsistency with trial testimony are left to the weight given to

the evidence, rather than its admissibility.[152]

Oklahoma

In *Harris v. State,* the Oklahoma Court of Criminal Appeals noted its reluctance to permit a reenactment in the form of an animation when it only illustrates a hypothetical situation.[153] Where however, an animation supports a scientific or technical hypothesis, the court applies the same test to determine admissibility as for photographic exhibits.[154] There are three requirements that must be demonstrated before it is admissible: "(1) that it be authenticated - the trial court should determine that it is a correct representation of the object portrayed, or that it is a fair and accurate representation of the evidence to which it relates, (2) that it is relevant, and (3) that its probative value is not 'substantially outweighed by the danger of unfair prejudice, confusion of the issues, misleading the jury, undue delay, needless presentation of cumulative evidence, or unfair and harmful surprise.'"[155] Additionally, the trial court should instruct the jury that the evidence is a re-creation of a version of events, and "should in no way be viewed as the absolute truth."[156] Finally, the trial court must ensure that the opposing party has an opportunity to examine the reenactment.[157] During deliberations, the animations

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[148] Kane v. Triborough Bridge & Tunnel Authority, 778 N.Y.S.2d 52, 54 (NY. Sup. Ct. App. Div. 2004).

[149] *Id.*

[150] *See, e.g.*, State v. Hinojosa, 798 N.W.2d 634, 640 (N.D. 2011) (permitting the use of a photographic map prepared with use of a computer mapping program).

[151] *See, e.g.*, State v. Gerike, 2008 Ohio App. LEXIS 3976, at *8 (Ohio Ct. App. 1996) (citing State v. Geneva, 1996 Ohio App. LEXIS 3781 (Ohio Ct. App. 1996); State v. Clark, 655 N.E.2d 795 (Ohio Ct. App. 1995); Deffinbaugh v. Ohio Turnpike Comm., 588 N.E.2d 189 (Ohio Ct. App. 1990)).

[152] *Id.*

[153] 13 P.3d at 493.

[154] *Id.* at 494.

[155] *Id.* at 495 (adopting the test set forth by the South Carolina Supreme Court in *Clark*, 529 S.E.2d 528).

[156] *Id.*

[157] *Id.*

should not be made available to the jury because they do not possess independent evidentiary value.[158]

A computer-generated animation can be appropriately used as a demonstrative aid for expert or witness testimony in Oklahoma.[159] When used as an illustrative aid, rather than as a re-creation, a computer-generated animation is properly admitted where it is sufficiently accurate and its probative value exceeds its potentially misleading effect.[160]

Pennsylvania

The Pennsylvania Supreme Court has categorized computer-generated animation as demonstrative evidence.[161] As such, in order for the evidence to be admissible, there must be a showing that the evidence: (1) is authenticated; (2) is relevant; and (3) most importantly, has a probative value that is not outweighed by the danger of unfair prejudice.[162] The court noted that the difference between past uses of demonstrative evidence such as chalk drawings and present uses such as animation is "one of mode, not meaning."[163] Although an animation may be more persuasive than past uses of demonstrative evidence, that is not a proper grounds for excluding the relevant evidence.[164] With the dangers

inherent in the use of computer-generated evidence, however, a limiting instruction is proper.[165]

South Carolina

The South Carolina Supreme Court has categorized computer-generated animations as demonstrative evidence which is admissible when the proponent shows that it: (1) is authentic; (2) is relevant; (3) is a fair and accurate representation of the evidence to which it relates; and (4) has a probative value that substantially outweighs the danger of unfair prejudice, confusing the issues, or misleading the jury.[166] South Carolina requires that the proponent of this evidence disclose it to the opposing party a sufficient time before trial so that the opposing party may analyze it and formulate any objections.[167] Finally, the trial court should give a cautionary instruction if the animation purports to be a re-creation of an event.[168]

South Dakota

In South Dakota, the proponent of a computer-generated re-creation must "describe the system and show that the program produced an accurate result."[169] Additionally, the animation should be "relevant, probative, and nearly identical" to the subject events.[170] The proponent should also demonstrate that the anima-

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[158] Dunkle v. State, 139 P.3d 228, 251 (Okla. Crim. App. 2006).

[159] Tull v. Fed. Express Corp., 197 P.3d 495, 499 (Okla. Civ. App. 2008).

[160] Lawson v. Nat'l Steel Erectors Corp., 8 P.3d 171, 178 (Okla. Civ. App. 2000).

[161] Serge, 896 A.2d at 1179.

[162] Id. at 1177.

[163] Id. at 1178.

[164] Id. at 1179.

[165] Id.

[166] Clark, 529 S.E.2d at 536.

[167] Id.

[168] Id.; Webb v. CSX Transp., Inc., 615 S.E.2d 440, 448 (S.C. 2005).

[169] Sommervold v. Grevlos, 518 N.W.2d 733, 738 (S.D. 1994).

[170] Id.

tion fairly and accurately reflects the testimony of the witness whose testimony it supports.[171] In *Sommervold*, the South Dakota Supreme Court quoted the trial court favorably as stating, "'a video recreation of an accident . . . becomes in the nature of testimony and it stands out in the jury's mind. So it emphasizes that evidence substantially over . . . ordinary . . . spoken testimony.'"[172] Therefore, where the facts relied upon were inconsistent with the oral testimony, it was properly excluded.[173]

Tennessee

In *State v. Farner*, the Tennessee Supreme Court addressed the admissibility of computer-animated visualization.[174] There are three requirements before introducing an animation as an illustrative aid: (1) the expert testimony it is meant to illustrate must be admissible; (2) the animation must be "a fair and accurate depiction of the event it purports to portray"; (3) and its probative value must not be outweighed by the danger of unfair prejudice.[175] The court noted that the second requirement is "particularly important" for a computer animated re-creation of an event because "the jury may be so persuaded by its life-like nature that it becomes unable to visualize an opposing or differing version of the event." Additionally, a limiting instruction is appropriate to explain that the

animation is an illustration of the witness's testimony.[176]

A simulation, by contrast, requires "much more specific foundational proof" than an animation, and the proponent is required to demonstrate the "validity of the science" it relies upon.[177]

Texas

Texas has distinguished between inanimate and animate portrayals.[178] An inanimate portrayal such as a three-dimensional depiction of a crime scene or a computer-generated depiction of a crime scene may be "based on quantifiable measurements."[179] In the context of criminal trials, with an animate depiction it is "impossible to duplicate in every minute detail and [they] are therefore inherently dangerous, offer little in substance and the impact of re-enactments is too highly prejudicial to insure the State or the defendant a fair trial."[180]

Utah

The Utah Supreme Court has stated that animations, as a subset of demonstrative evidence, do not require the witness to know how the animation was created in order to be authenticated.[181] Instead, the animation need only "accurately reflect"

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[171] *Id.*

[172] *Id.*

[173] *Id.*

[174] 66 S.W.3d 188, 208 (Tenn. 2001).

[175] *Id.* at 208-209.

[176] *Id.* at 210.

[177] *Id.*; State v. Drake, No. E2004-00247-CCA-R3-CD, 2005 Tenn. Crim. App. LEXIS 559, at *33 (Tenn. Crim. App. June 6, 2005).

[178] Lewis v. State, 402 S.W.3d 852, 864-865 (Tex. Ct. App. 2013).

[179] *Id.*

[180] *Id.*

[181] State v. Perea, 322 P.3d 624, 637 (Utah 2013).

the witness's testimony.[182] Computer simulations, by contrast, "are submitted as substantive evidence with independent probative value" and therefore require a higher threshold showing to be admissible.[183]

Vermont

Vermont has not specifically addressed the admissibility requirements for computer-generated simulations or animations in a discovered case. The Vermont Supreme Court has, however, affirmed the trial court's admission of a computer rendering of a construction project, which the opposing party characterized as a simulation.[184]

Virginia

Virginia courts have been skeptical regarding the use of computer simulations. In *Tittsworth v. Robinson*, the Virginia Supreme Court evaluated expert evidence that relied upon a computer program which the expert did not develop.[185]

Washington

Washington has required that computer-generated simulations meet three requirements in order to be admitted as substantive proof or as the basis for expert

testimony: "(1) the computer is functioning properly; (2) the input and underlying equations are sufficiently complete and accurate; and (3) the program is generally accepted by the appropriate community of scientists for use in the particular situation at hand."[186]

Additionally, Washington has treated an animation as demonstrative evidence, which may be admitted when "the experimental conditions are substantially similar to the facts of the case."[187]

Wisconsin

In *State v. Denton*, a Wisconsin appellate court noted that to the extent computer-generated animations "represent simply a new type of illustrative evidence, their admissibility is controlled by the basic principles applied to all demonstrative aids."[188] Without applying a particular standard, the court noted, that simulations requiring the use of "scientific data, principles and methods to formulate a computer-generated conclusion about the events at issue" are not subject to the same standard as illustrative evidence.[189]

Wyoming

The Wyoming Supreme Court has held that a computer-generated animation is admissible so long as it "does not offend

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[182] *Id.*

[183] *Id.* at 636.

[184] *In re* Eastview at Middlebury, Inc., 992 A.2d 1014, 1023 (Vt. 2009).

[185] 475 S.E.2d 261, 262 (Va. 1996); *see also* Boyer v. Dabinett, 74 Va. Cir. 19, 20 (Va. Cir. Ct. 2007) (rejecting expert evidence using a computer program which simulated automobile crashes in a case extrapolating its use to the birth canal).

[186] State v. Sipin, 123 P.3d 862, 868 (Wash. Ct. App. 2005).

[187] State v. Hultenschmidt, 102 P.3d 192, 197 (Wash. Ct. App. 2004).

[188] 768 N.W.2d 250, 253-254 n. 1 (Wis. Ct. App. 2009).

[189] *Id.*

the rules of evidence."[190] In other words, it should be authenticated, relevant, and not subject to an exclusionary rule.[191]

VI.   Conclusion

Nearly every state and federal circuit has addressed the use of computer-generated animations and simulations because their use is now commonplace. As is evidenced by the limiting instructions and cautionary words of the courts, they are effective tools in persuading the jury. Thus, the risk for undue prejudice is greater than it may be for other forms of evidence, and courts will typically strictly apply the rules of evidence. Alert practitioners will strongly consider whether their cases present opportunities to utilize computer-generated evidence, and those who oppose its use against their clients should utilize aggressive cross-examination of the proponent's experts, *Daubert* challenges, timeliness objections, and requests for cautionary instructions to combat the effective use of this potentially case-defining evidence.

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[190] Minun v. State, 966 P.2d 954, 959 (Wyo. 1998).

[191] *Id.*