



**IN THE COURT OF CRIMINAL APPEALS
OF TEXAS**

NO. PD-1053-19

ALLEN BRAY PUGH, Appellant

v.

THE STATE OF TEXAS

**ON APPELLANT'S PETITION FOR DISCRETIONARY REVIEW
FROM THE ELEVENTH COURT OF APPEALS
TAYLOR COUNTY**

**NEWELL, J., delivered the opinion of the unanimous Court.
WALKER, J., filed a concurring opinion.**

Must a trial court suppress a demonstrative computer animation illustrating otherwise reliable expert testimony purely because it potentially involves some depiction of human behavior? No. Demonstrative exhibits used to illustrate expert opinion testimony must

be based upon scientifically reliable testimony that has been based upon objective data. If they are, they are treated like any other piece of demonstrative evidence. Accordingly, a trial court may admit a computer animation exhibit as a demonstrative exhibit to illustrate otherwise admitted testimony or evidence if the exhibit's proponent shows that it: (1) is authenticated, (2) is relevant, and (3) has probative value that is not substantially outweighed by the danger of unfair prejudice. To the extent that a demonstrative exhibit includes a depiction of human behavior, the risk that such depictions will not capture every minute detail of that behavior are addressed by weighing the danger of unfair prejudice against the probative value of the exhibit.

In this case, the State sought to illustrate the testimony of an accident reconstruction expert along with testimony regarding other forensic evidence with a series of computer animations. The three computer animations at issue each show a moving, 3-D diagram of Appellant's truck from three different angles colliding with a human figure, consistent with the testimony of the State's sponsoring accident reconstruction expert.¹ We agree with the court of appeals that the computer animations were properly admitted. The computer animations

¹ Each video can be viewed at the Court's website at the following link: <https://www.txcourts.gov/cca/media/>

were relevant, were authenticated, and had probative value that was not substantially outweighed by the danger of unfair prejudice. Accordingly, we affirm the judgment of the court of appeals.

Background

This case concerns events that took place on October 8, 2014, between three neighboring bars in Abilene. The Fat Boys bar, the Lone Star bar, and the Drop Zone bar were situated in a row along Arnold Blvd. The Fat Boys bar was the northernmost bar; the Drop Zone bar was the southernmost bar; and the Lone Star bar was situated between them. Cars as well as patrons could park and travel between the three bars on a common caliche gravel lot.

William Delorme was drinking at the Lone Star bar and was acting strangely. Alexandra Schkade, the bar's sole bartender, noticed Delorme acting strangely and decided to close the bar early. After Schkade closed the bar, Delorme returned and insisted that he had lost his keys inside the bar. Schkade looked for the keys but could not find them. She told Delorme that the keys were not there and tried to get back to closing the bar so that she could go home.

Shortly after, Delorme began to knock on the bar's locked front door and, believing the knocking to be from someone else, Schkade unlocked the door. Delorme forced his way past Schkade and started looking for his keys in the bar. Schkade returned to her duties and attempted to maintain normalcy, but Delorme's frantic behavior deteriorated to the point that he pulled a knife on Schkade.

At this point, Appellant and his friends, believing the Lone Star bar was still open, entered through the unlocked door. Appellant's group entered the bar just in time to see Delorme pull a knife on Schkade. The group attempted to de-escalate the situation by offering to help Delorme find his keys. As part of this effort, the group directed Delorme outside the bar to get him away from Schkade. While the group helped Delorme, Appellant told Schkade, "if [Delorme] tries to pull out that knife again, we'll put him under the car."

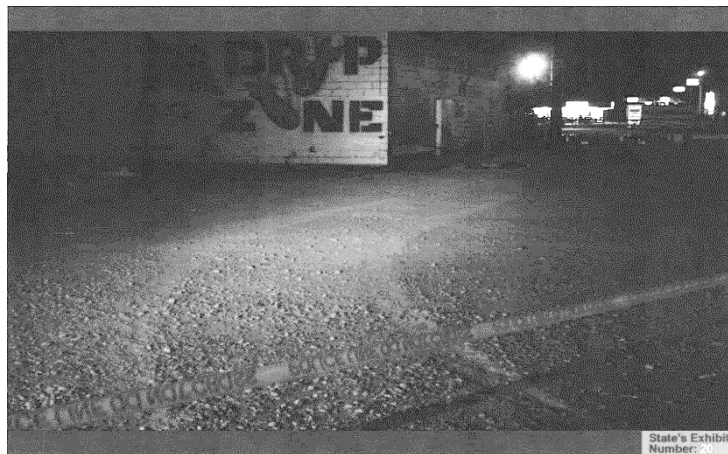
While the group helped Delorme outside, Jerry Anderson approached from the neighboring Fat Boys bar. Anderson joined the search for Delorme's keys. During the search, Appellant approached Anderson and told him: "we should knock [Delorme] out or something."

Eventually, Delorme abandoned the search and shuffled out of view across the street. Schkade was able to finish closing the bar and left the scene in her car. When Schkade left the bar, she could see Appellant's group smoking outside near the front of the bar but could not see Delorme. Appellant and Anderson stayed and talked in the parking lot in front of the Lone Star bar for about 15 to 20 minutes until they saw Delorme re-approaching the area. Anderson suggested to Appellant that they leave, and both he and Appellant walked to their cars, which Anderson testified were parked at the neighboring Fat Boys bar. As Anderson drove away, the last thing Anderson saw was Appellant's stationary brake lights.

The Investigation

A few hours later, a dogwalker found Delorme's dead body in the parking lot between the Lone Star bar and the Drop Zone bar. He called 911 and, shortly thereafter, the Abilene Fire Department and EMS arrived on scene. Soon thereafter, officers with the Abilene Police Department arrived and started collecting evidence as part of a criminal investigation.

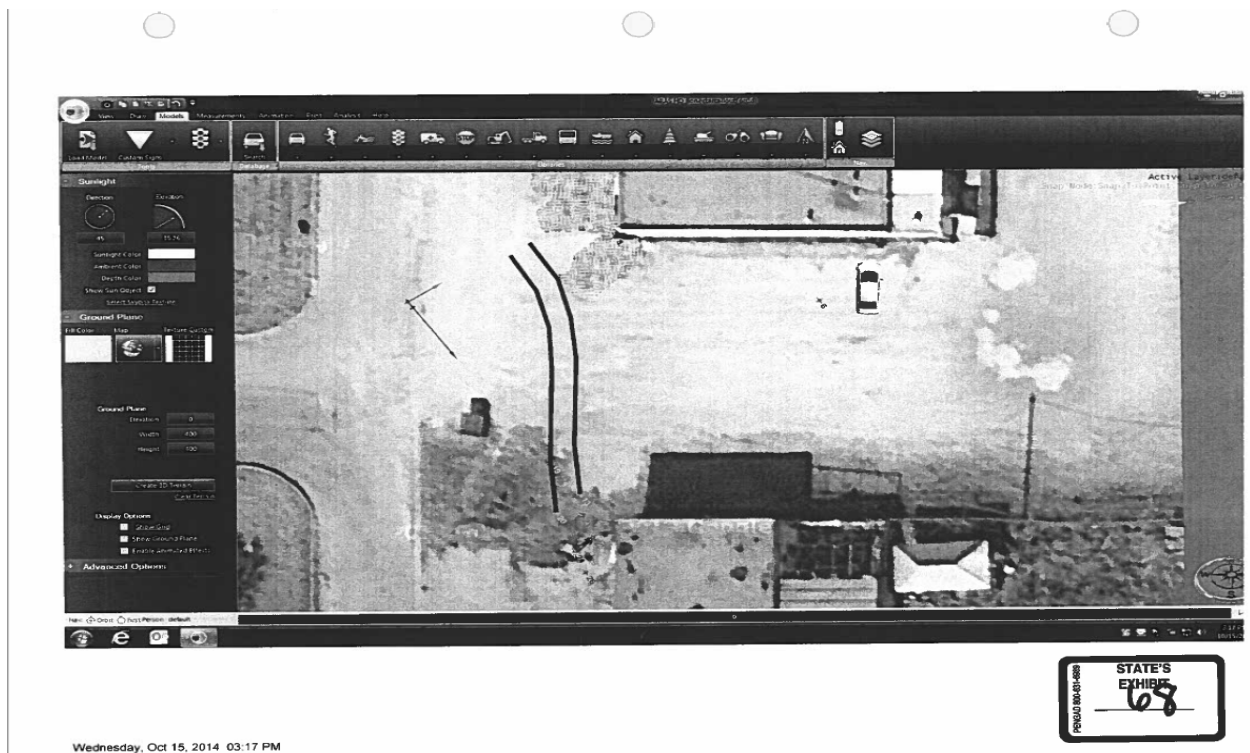
As part of that investigation, officers observed a set of tire tracks leading directly to Delorme's body, which were documented in State's exhibit 20:



Officers estimated the tracks to run about 85 feet from their start near the Lone Star bar to where the body was found next to the Drop Zone bar. They also took measurements of the wheelbase and tire width from the tire tracks for future comparisons. Officers also found a knife and sheath well outside of arms reach from Delorme's body.

Officer David Thompson, an expert in accident reconstruction, electronically documented the scene by picking various reference points and taking measurements with a range finder. Thompson documented measurements for the tire marks, body, surrounding buildings, and

other objects around the body (totaling 28 separate points of reference). After uploading these measurements into a Measurement Log Report, Thompson used specialty computer software to create a two-dimensional reference diagram of the scene, which was admitted at trial without objection as State's Exhibit 68:



The diagram demonstrated Thompson's findings of two tire marks avoiding the adjacent roads and heading southbound through the parking lot with a definite turn in the marks' path. In addition, Thompson saw definite acceleration markings leading southbound to the body and no evidence of deceleration marks at any point on the path.

Finally, Thompson noted clear evidence of steering input in the tire marks' pattern, signaling that the car was not "out of control."

The next day, Dr. Richard Fries, a deputy medical examiner, performed Delorme's autopsy. At the time of the autopsy, Fries observed multiple significant injuries, including rib fractures, a punctured lung, and numerous pelvic fractures. Fries noted that pelvic fractures are usually seen in "crushing-type" injuries and are indicative of being "run-over." Fries further noted a tear in the skin of Delorme's scalp as indicative of impact injuries, such as being struck by a vehicle or striking the ground post-impact.

Fries believed that it was possible that Delorme had been dragged by the car, but not for a significant length. In his opinion, if the body had been dragged under the car, it was likely only for approximately 10 feet. He identified a deep abrasion, about 13 inches long, on Delorme's back that is commonly associated with "impacts with roadways or when somebody has been struck as they hit another surface." He also noted that a body could receive this kind of injury from being under the undercarriage of a vehicle. Fries further noted a collection of fluid underneath the body's skin that was caused by compression of the

bodily tissues forcing blood to squeeze out of one area and into another, which was indicative of not merely being hit with a vehicle but being run over.

Fries opined that Delorme died from multiple blunt-force injuries from being hit by a motor vehicle and run over. In Fries' opinion, the left side of Delorme's body took more of the impact because of the relative damage to the left side. However, Fries did not give an ultimate conclusion on which side of Delorme's body was struck by the truck and which side was struck by the pavement. He explained that because the victim suffered injuries from both the impact of the car and the impact of the pavement, he was unable to tell which injury was caused by which impact.

Through their investigation, officers quickly came to suspect Appellant and obtained a warrant to seize his truck. Upon locating the truck, officers immediately noticed that it appeared to have hit something. Specifically, officers observed a clean area underneath the truck that appeared to have "rubbed something," similar to how an otherwise dirty car would look after hitting a deer or hog: "the whole vehicle underneath was dirty and something had rubbed underneath it."

The marks started around the front left (driver's side) of the vehicle, around the back side of the driver's side front tire and approximately under the driver's floorboard area and moved backwards underneath the vehicle.

After officers seized the truck, they conducted further forensic analysis that affirmatively tied the truck to Delorme. Officers compared the wheelbase and tires of the Appellant's truck with the measurements taken of the tread marks found leading to Delorme's body. They discovered that the tires were a very close match to those measured earlier. Officers sprayed Bluestar, a chemical reagent that reacts with blood, on the undercarriage and side of the truck. The Bluestar spray reacted in multiple places around the driver's side tire and door. Finally, officers searched along the undercarriage of the truck and discovered pieces of skin with hair attached. Later DNA analysis of the collected hair, tissue, and blood confirmed that the samples belonged to Delorme.

The Trial

Following the investigation, the State charged Appellant with murder. About one month prior to trial, the State disclosed four proposed trial exhibits to Appellant. The four exhibits were computer-

generated animations, created by a certified crash reconstruction expert,² illustrating the expert's opinion of the actions of Appellant's truck prior to Delorme's death. One of the exhibits depicted events from Appellant's viewpoint inside the cab of his truck. The remaining three exhibits showed separate long-distance views, [a bird's eye view](#), [a northeast view](#), and [a southeast view](#), of a truck accelerating across a parking lot, striking, and then running over a stationary human figure. The exhibit showing a bird's eye view shows the victim as little more than a dot, while the alternating side views are from a closer vantage point. In the exhibits showing views from the northeast and southeast, the depicted figure is empty-handed, stationary, and lacks any facial features or expression. In addition, the figure does not independently move or react to the truck. When the truck strikes the figure, the body and limbs remain rigid with no apparent reaction beyond falling to the

² At trial, Officer Kropp, who created the contested exhibits, testified as a crash reconstruction expert. He testified that he had received specialized training in crash reconstruction including (1) an 80-hour advanced collision investigation course through "TEEX", (2) an 80-hour course in scientific collision and reconstruction, and (3) a three-week course through the Texas Association of Accident Reconstruction Specialists. Though he testified that he was "certified," he was not asked to identify where he received that certification because his qualifications were not contested. As noted by Judge Hervey in her concurring opinion in *Rhomer v. State*, traffic accident reconstruction is a discipline that is exempted from the Texas Forensic Science Commission's crime laboratory accreditation requirement. *Rhomer v. State*, 569 S.W.3d 664, 674 (Tex. Crim. App. 2019) (Hervey, J., concurring).

ground with the figure's body. There does not appear to be any application of a physics engine depicting soft body dynamics to the human figure in the animation to mimic a realistic reaction of a human body to the impact of the vehicle and the ground. None of the exhibits depicted any of the victim's injuries from being hit by the truck.

Following the disclosure of the exhibits, Appellant filed a motion to suppress. In his motion, Appellant argued that the exhibits were mere interpretations based on conjecture that did not and could not accurately depict the events in question. Further, Appellant argued that the exhibits were subject to inaccuracies, could mislead and confuse the jury, and were substantially more prejudicial than probative. During a pre-trial hearing on the motion, Appellant further argued that any staged recreation involving human beings is impossible to duplicate in every minute detail and is therefore inherently more prejudicial than probative. Appellant did not argue that the expert's opinion or testimony was scientifically unreliable under Texas Rule of Evidence 702.³

³ See TEX. R. EVID. 702 ("A witness who is qualified as an expert by knowledge, skill, experience, training, or education may testify in the form of an opinion or otherwise if the

At the suppression hearing, the State called certified accident reconstructionists Thompson and Tyson Kropp to testify regarding the underlying creation of the exhibits. Thompson confirmed the validity of the underlying data used to create the exhibits by explaining his evidence collection process. He also pointed out the tire markings from the parking lot that suggested that Appellant's truck was accelerating and engaged in a turn to the right along its path towards Delorme's body. Finally, Thompson described the process of downloading the data into a computer system, which could create a 2-D image or 3-D representative model of the scene.

Kropp testified that he used Thompson's data and combined it with other collected evidence to create the 3-D animations. He elaborated by explaining the general process of inputting data points into the FARO HD system to create a 3-D animation and then described the specific steps he took in this case. He further noted that he took previously collected reference points of the scene, created a digital image representing the reference points, and overlaid it with a version of

expert's scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact in issue.").

Google Earth. Next, he determined the “most accurate speed” for the animated vehicle by conducting 15 field acceleration tests with an accelerometer specially mounted in a police Tahoe at a similarly surfaced parking lot. He also explained that he used the DNA evidence, forensic evidence, photos taken on scene, the autopsy report, and his own acceleration tests to create the final animations. Finally, Kropp confirmed that the exhibits fairly and accurately represented his opinion regarding what “the evidence shows of the scene that evening.”

Appellant offered no challenge to the experts’ qualifications, their opinions, or the underlying process used to create the exhibits. However, he did question Kropp regarding the positioning of Delorme within the animation. Kropp stated that he could use the forensic evidence, including the rub marks and DNA, to tell the approximate area Delorme was struck by the vehicle and what part of the vehicle went over Delorme. While Kropp admitted that he did not precisely know what Delorme’s actions were at the time of the collision, he did rely on “the medical examiner’s opinion that the injuries sustained were on the left side of his body to orient him in the animation.”

For context, later in the trial, Kropp further clarified that he did not place Delorme's body randomly within the animation. He elaborated that the body was placed within a short proximity of its final location because of the medical examiner's opinion that it did not interact with the vehicle for an extended amount of time. Kropp further noted that he saw no evidence that the body ever traveled on the hood of the car. So, although he admitted that he did not know specifically where along the truck's acceleration path the body was struck, he did provide specific details and justifications based upon objective data for his positioning of Delorme's body within the animation.

At the end of the hearing, the trial court overruled defense objections for all but one of the exhibits. The trial court excluded the 'first person' animation because it could "get very subjective as to what could be seen from the inside of the vehicle." The trial court clarified that its ruling regarding the other three 'long-distance' animations would be subject to the establishment of the State's underlying evidence prior to the admission of the exhibits. In addition, the trial court explained that it would give a limiting instruction regarding the exhibits.

The trial proceeded and the State presented the foregoing evidence surrounding the offense and investigation before the jury. At the end of its case-in-chief, the State indicated that it was prepared to admit and publish the contested exhibits as part of Kropp's testimony. Appellant objected and argued that the probative value of the exhibits was substantially outweighed by the prejudicial effect because "there is no way to know for sure what the alleged victim was doing or purporting to be doing and/or exactly where the alleged victim was."

The trial court overruled the objection and announced its intention to provide an instruction to the jury. Prior to display of the exhibits, the trial court told the jury:

Ladies and gentlemen of the jury, the State has introduced an animation purporting to recreate the events alleged in the indictment. The animation is a visualization of the expert's opinion. It is admitted for the sole purpose of aiding the jury and understanding the events, if any, which happened and may be considered by the jury only to the extent that the jury believes beyond a reasonable doubt that other evidence introduced by the State supports the events as depicted in the animation.

After the State played the exhibits, Kropp explained on cross-examination that he placed the figure in the animation within a short proximity of where it was found based on the medical examiner's belief

that the body was not “interacting with the vehicle for an extended amount of time.” Kropp further testified that he did not believe the body had hit the hood of the truck or went under the truck from the driver’s side because the observable evidence present on the truck did not support that version of events. However, he did acknowledge that no one knew specifically where the Appellant’s truck struck Delorme’s body in the path of the acceleration marks.

After Kropp’s testimony, the State rested its case, and Appellant took the stand. Appellant testified that he saw Delorme threatening the bartender with a knife on the night of October 8, 2014. Appellant claimed that while he was attempting to deal with Delorme, Delorme told him “I’m going to get you” and told him that he knew everything about him and where he lived. Shortly after this, Delorme left the premises. Appellant testified that he and Anderson chatted outside in front of the Lone Star bar until they saw Delorme re-approaching the area from across the road, at which point both men decided to leave in their cars.

Appellant acknowledged that he originally denied to the police that he had run over the victim with his truck. However, in the face of the

State's evidence, he admitted that he had. According to Appellant, while he was backing his truck out of its parking space, he saw Delorme and tried to talk to him through his passenger side window. As Appellant attempted to talk to Delorme, Delorme began yelling at Appellant and walked around the front of the truck toward Appellant's open driver's side window. Appellant claimed that Delorme was carrying a knife and screaming that he was going to kill him.

Appellant next claimed that Delorme rounded the front of the truck (to the side of and about even with the front driver's-side tire) and lunged at him with his knife. Appellant claimed he reacted by lying "over on the console" and flooring it. Appellant then described hearing a "thud" and remembers Delorme being "right there" through the front windshield. Appellant finished his direct testimony by claiming that he did not originally believe that he had run over Delorme but believed, instead, that Delorme had "grabbed ahold of the mirror or the inside of my door and just fell off" of the truck.

On cross-examination, Appellant struggled to explain various inconsistencies between his testimony and the physical evidence. For instance, Appellant claimed that Delorme rolled onto the top of the

truck's hood; however, Appellant could not explain how Delorme went from standing even with the front driver's-side tire to being on the truck's hood. Finally, Appellant admitted to previously telling law enforcement officers that he would know if he ran somebody over and that he knew he did not run Delorme over. But ultimately, Appellant admitted to the jury that the evidence showed that he had.

In response to the Appellant's testimony, the State recalled Kropp, who noted that the objective evidence did not support Appellant's testimony regarding the victim being near the passenger side of the truck as Appellant tried to pull out of the parking lot. Kropp noted that there was no evidence to show that Delorme's body went under Appellant's truck "in any way other than a long way under the vehicle." Finally, Kropp maintained that "the marks underneath this vehicle support that the deceased went under the vehicle more in the center of the undercarriage of the vehicle" rather than the side near the driver's door as Appellant had claimed in his testimony.

After the State's rebuttal, both parties rested and closed. Appellant requested and received a jury instruction on the issue of self-defense. After argument by both parties, the jury found Appellant guilty

of murder and assessed punishment at 50 years confinement and a fine of \$10,000. Though the CDs containing the computer animations were admitted into evidence and sent back to the jury for deliberations, it was impossible for the jury to view them without requesting assistance from the trial court. Nothing in the record indicates that the jury ever viewed the contested exhibits during its deliberations.

The Appeal

Appellant argued to the court of appeals that the trial court abused its discretion by admitting the three exhibits into evidence.⁴ According to Appellant, the trial court should have excluded the exhibits because they were inherently speculative due to their depictions of human behavior, which is impossible to reproduce in every minute detail.⁵ Further, he argued that the exhibits carried a substantial risk of unfair prejudice because they did not base Delorme's behavior on scientific information.⁶

⁴ *Pugh v. State*, No. 11-17-00216-CR, 2019 WL 4130793, at *1 (Tex. App.—Eastland Aug. 30, 2019 pet. granted) (mem. op., not designated for publication).

⁵ *Id.* at *2.

⁶ *Id.*

The court of appeals disagreed. It held that the trial court did not abuse its discretion in admitting the exhibits because the animations depicted the scene from a distance, showed nothing gruesome, and did not attempt to portray Delorme's actions prior to the truck strike.⁷ Further, the court of appeals noted widespread support for the use of computer animation to recreate the scene of an accident "as long as the animation is based on objective data" as the animations were in this case.⁸

On discretionary review, Appellant argues that the exhibits were inadmissible as demonstrative exhibits because the use of a stationary figure to represent the location and position of the victim contradicted the evidence he later presented in his case. Specifically, Appellant argues that the court of appeals erred in holding that the trial court was within its discretion when it allowed the State to introduce three animations to the jury which depicted the decedent Delorme as unarmed

⁷ *Id.* at *3 (citing generally *Venegas v. State*, 560 S.W.3d 337, 347–48 (Tex. App.—San Antonio 2018, no pet.); *Castanon v. State*, No. 08-15-00225-CR, 2016 WL 6820559, at *3 (Tex. App.—El Paso Nov. 18, 2016, no pet.) (mem. op., not designated for publication); *Murphy v. State*, No. 11-10-00150-CR, 2011 WL 3860444, at *2 (Tex. App.—Eastland Aug. 31, 2011, no pet.) (mem. op., not designated for publication); *Mendoza v. State*, No. 13-09-0027-CR, 2011 WL 2402045, at *14–15 (Tex. App.—Corpus Christi June 9, 2011, no pet.) (mem. op., not designated for publication)).

⁸ *Id.*

and stationary, contrary to the evidence. Underlying his complaint in this regard, Appellant argues that any staged re-enacted criminal acts or defensive issues involving human beings are impossible to duplicate in every minute detail and are therefore inherently dangerous and offer little in substance, and the impact of re-enactments is too highly prejudicial to ensure a fair trial. According to Appellant, we should only sanction the admissibility of computer animations featuring human behavior, if we are to do so at all, when three conditions are met: 1) the other evidence presented is inadequate to convey the events to the jury, 2) the animation is consistent with the evidence adduced at trial, and 3) a limiting instruction clarifying that the demonstrative exhibit is not evidence is given. As discussed below, we conclude that the traditional rules of evidence provide an adequate foundation for trial courts to evaluate the admissibility of computer-generated evidence.

Computer Animations Can Be Admissible as Demonstrative Evidence

A computer animation is simply a series of computer-generated images used as demonstrative evidence.⁹ Accordingly, it can be used

⁹ *Goode, The Admissibility of Electronic Evidence*, 29 REV. LITIG. 1, 22 (Fall 2009).

to “illustrate what a witness saw, demonstrate for the jury the general principles that underlie an expert’s opinion, or depict an expert’s theory of how an accident occurred.”¹⁰ Instead of a witness drawing 1,000 diagrams and lining them up back-to-back to illustrate her testimony, a computer animation allows her to illustrate her testimony pane-by-pane using the advancements of modern technology.¹¹

Generally, demonstrative exhibits must be authenticated, relevant, and have probative value that is not substantially outweighed by unfair prejudice to be admissible.¹² While we have not previously

¹⁰ *Id.*

¹¹ See, e.g., JOHN K. POWERS, 1 Ann.2004 ATLA-CLE 1211, ATLA ANNUAL CONVENTION REFERENCE MATERIALS, VOL. 1 (Association of Trial Lawyers of America, 2004) (“When you think about it, a movie or videotape is simply a series of photographs that are taken so close together that when they are played back at a certain speed there appears to be continuous motion. . . . Applying the same concept to accident reconstruction is simple. For example, we know that a vehicle traveling at 60 miles per hour travels at 88 feet per second. If you had a drawing of a road that was 100 feet long, you could draw a series of pictures showing where the car started and where it was on that road every second, or every 1/2 second or every 1/4 second. All the computer is doing in this case is making the necessary mathematical calculations and drawing the next picture for you.”).

¹² TEX. R. EVID. 901(a), 401, 403; see also *Simmons v. State*, 622 S.W.2d 111, 113 (Tex. Crim. App. 1981) (panel op.) (“Visual, real, or demonstrative evidence, regardless of which term is applied, is admissible upon the trial of a criminal case if it tends to solve some issue in the case and is relevant to the cause that is, if it has evidentiary value, i.e., if it sheds light on the subject at hand.”); *Vollbaum v. State*, 833 S.W.2d 652, 657 (Tex. App.—Waco 1992, pet. ref’d) (“An item of demonstrative evidence must be properly identified, i.e., a showing that the matter in question is what its proponent claims.”); *Torres v. State*, 116 S.W.3d 208, 213 (Tex. App.—El Paso 2003, no pet.) (“The trial court may exclude demonstrative evidence if the probative value is substantially outweighed by the danger of unfair prejudice, confusion of the issues or misleading the jury.”).

addressed the specific admissibility of computer animations as demonstrative evidence, they are not fundamentally different from any other form of demonstrative evidence and should be admitted given the proper evidentiary predicate described above for demonstrative exhibits.¹³ Accordingly, a trial court does not abuse its discretion to admit a demonstrative computer animation, used to illustrate the otherwise scientifically reliable testimony of a witness, if the animation: 1) is authenticated, 2) is relevant, and 3) has probative value that is not substantially outweighed by the danger of unfair prejudice.¹⁴

With regard to authentication, the proponent of the computer animation must show that the computer animation is a fair and accurate

¹³ See MCCORMICK ON EVIDENCE § 218 (8th ed. 2020) (“[R]e-creation animations must only be shown to be relevant to the issues in the case, authenticated as a fair and accurate depiction of an expert’s opinion. In addition, of course, they are subject to trial court discretion under Federal Rule 403[.]”).

¹⁴ See TEX. R. EVID. 901(a), 401, 403. Requiring computer animations, serving as demonstrative exhibits, to satisfy traditional evidentiary standards of authentication, relevance, and compliance with Rule 403 is generally in line with the traditional approaches taken by many other state courts when considering the admissibility of computer animations as demonstrative evidence. See, e.g., *People v. Cauley*, 32 P.3d 602, 606–07 (Colo. App. 2001) (Colorado); *State v. Dodds*, 159 N.H. 239, 250–51, 982 A.2d 377, 387–88 (2009) (New Hampshire); *Harris v. State*, 2000 OK CR 20, 13 P.3d 489, 495 (Okla. Crim. App. 2000) (Oklahoma); *Commonwealth v. Serge*, 586 Pa. 671, 896 A.2d 1170, 1178–79 (2006) (Pennsylvania); *Clark v. Cantrell*, 339 S.C. 369, 529 S.E.2d 528, 536–38 (2000) (South Carolina); *State v. Farner*, 66 S.W.3d 188, 208–09 (Tenn. 2001) (Tennessee); *State v. Perea*, 2013 UT 68, ¶ 52, 322 P.3d 624, 637 (Utah 2013) (Utah); *State v. Denton*, 319 Wis.2d 718, 768 N.W.2d 250, 255–60 (Wis. Ct. App. 2009) (Wisconsin); *Mintum v. State*, 966 P.2d 954, 959 (Wyo. 1998) (Wyoming).

portrayal of what its proponent claims it to be, as opposed to “any idea of speculation, conjecture, or presumption of what the exhibit represents.”¹⁵ Specifically, when a demonstrative exhibit is used to illustrate the opinion of a testifying expert, it can be authenticated by the expert’s testimony that “the animation fairly and accurately represents that opinion.”¹⁶ This is because the authentication of demonstrative evidence derives from its status as a “fair and accurate representation of relevant testimony or documentary evidence otherwise admitted in the case.”¹⁷ As with any other piece of evidence

¹⁵ TEX. R. EVID. 901(a); see *Vollbaum*, 833 S.W.2d at 657 (“An item of demonstrative evidence must be properly identified, i.e., a showing that the matter in question is what its proponent claims.”); see also *Hartsock v. State*, 322 S.W.3d 775, 779 (Tex. App.—Fort Worth 2010, no pet.) (“Demonstrative evidence must be properly identified by showing that the item in question is what its proponent claims as opposed to any idea of speculation, conjecture, or presumption of what the exhibit represents.”).

¹⁶ MCCORMICK ON EVIDENCE § 214 (8th ed. 2020) (“Thus, as a demonstrative aid, [‘re-creation’ animations] could be authenticated by the expert’s testimony that the animation fairly and accurately represents that opinion.”); see *Goode*, 29 REV. LITIG. 1, 23–24 (“In each such instance the [demonstrative] evidence may be authenticated by the witness’s testimony that the computer animation presents a fair and accurate depiction. In essence, computer animations are no different from other forms of demonstrative evidence and reenactments. They must fairly and accurately represent what they purport to represent. If they do not, they will not be admissible.”); see also *Torres*, 116 S.W.3d at 213 (“The proponent is then required to established that the evidence is fair and accurate[.]”).

¹⁷ MCCORMICK ON EVIDENCE § 214 (8th ed. 2020); see *Goode*, 29 REV. LITIG. 1, 23–24. Of course, this presumes that the underlying expert testimony meets the requirements of Rule 702 and that otherwise illustrated evidence is properly admissible. See TEX. R. EVID. 702 (“A witness who is qualified as an expert by knowledge, skill, experience, training, or education may testify in the form of an opinion or otherwise if the expert’s scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact in issue.). As discussed above, Appellant has made no

in a contested trial, the demonstrative exhibit does not have to accurately reflect facts submitted by its *opponent* so long as it accurately represents the testimony or previously admitted evidence the *proponent* seeks to illustrate.¹⁸ The accuracy of the demonstrative exhibit is not considered as a matter of authentication but as part of a trial court's weighing of the probative value of the exhibit against the danger of unfair prejudice.

Second, the proponent of a computer animation must demonstrate that the evidence is "relevant" by showing that it is helpful in illustrating

arguments that the expert testimony (upon which the exhibits was based) in this case failed to satisfy Rule 702.

¹⁸ See *Vollbaum*, 833 S.W.2d at 657 ("An item of demonstrative evidence must be properly identified, i.e., a showing that the matter in question is what *its proponent claims*." (emphasis added); see also *Hartsock*, 322 S.W.3d at 779 ("Demonstrative evidence must be properly identified by showing that the item in question *is what its proponent claims* as opposed to any idea of speculation, conjecture, or presumption of what the exhibit represents." (emphasis added); see, e.g., *Wright v. State*, 178 S.W.3d 905, 920–21 (Tex. App.—Houston [14th Dist.] 2005, pet. ref'd) (holding that, under standards for in-court physical demonstrations and experiments, a contested in-court demonstration was substantially similar to "the actual event as theorized by the State" given the State's evidence and reasonable inferences that could be drawn from the evidence.). We note that the court of appeals in *Wright* did not clarify the exact positioning of the 'substantially similar' standard within a broader evidentiary framework. However, in a later case, the same court of appeals handled factual inaccuracies in a contested videotape demonstrative exhibit within a Rule 403-style analysis, consistent with our later discussion regarding inaccuracies and Rule 403. *Cockrell v. State*, No. 14-05-00862-CR, 2006 WL 2290743, at *3–4 (Tex. App.—Houston [14th Dist.] August 10, 2006, pet. ref'd) (mem. op., not designated for publication).

otherwise admitted evidence or testimony.¹⁹ Unlike relevance for the admission of substantive evidence, relevance for demonstrative evidence flows from the assistance that it gives to the trier of fact in understanding other real, testimonial, and documentary evidence.²⁰ Accordingly, a computer animation's relevance cannot be viewed as merely a question of independent probative value of substantive evidence because it has no independent probative value.²¹ Rather, the question of relevance for demonstrative exhibits boils down to its value in illustrating other admitted evidence and rendering that evidence more comprehensible to the trier of fact.²² Demonstrative evidence has no probative force "beyond that which is lent to it by the credibility of the witness whose testimony it is used to explain."²³

¹⁹ TEX. R. EVID. 401; *see also Milton v. State*, 572 S.W.3d 234, 240 (Tex. Crim. App. 2019) (citing MCCORMICK ON EVIDENCE § 214 (7th ed. 2016)) ("[D]emonstrations and demonstrative aids 'do not have independent probative value for determining the substantive issues in the case'; instead, they are relevant in theory 'only because of the assistance they give to the trier in understanding other real, testimonial and documentary evidence.'"); *Torres*, 116 S.W.3d at 213 ("The proponent is then required to establish . . . that it helps the witness to demonstrate or illustrate his testimony."); *Hartsock*, 322 S.W.3d at 779.

²⁰ *Milton*, 572 S.W.3d at 240 (citing MCCORMICK ON EVIDENCE § 214 (7th ed. 2016)).

²¹ MCCORMICK ON EVIDENCE § 214 (8th ed. 2020).

²² *Id.*; *see also Torres*, 116 S.W.3d at 213.

²³ *Torres*, 116 S.W.3d at 213; *see also Hartsock*, 322 S.W.3d at 779.

Finally, a computer animation is admissible if the danger of unfair prejudice, confusing the issues, misleading the jury, or other 403 factors does not substantially outweigh its probative value.²⁴ In general, a Rule 403 analysis should include, but is not limited to, a balancing of the following factors:

- (1) the probative value of the evidence;
- (2) the potential to impress the jury in some irrational, yet indelible way;
- (3) the time needed to develop the evidence; and
- (4) the proponent's need for the evidence.²⁵

Specifically, courts weigh "inaccuracies, variations of scale, [and] distortions of perspective" against "the degree to which the judge thinks that the item will assist the trier of fact in understanding a witness's

²⁴ TEX. R. EVID. 403 ("The court may exclude relevant evidence if its probative value is substantially outweighed by a danger of one or more of the following: unfair prejudice, confusing the issues, misleading the jury, undue delay, or needlessly presenting cumulative evidence."); see *Milton*, 572 S.W.3d at 240 ("[A] demonstrative aid must not be overly inflammatory."); *Baker v. State*, 177 S.W.3d 113, 123 (Tex. App.—Houston [1st Dist.] 2005, no pet.) ("To be admissible, objects offered as demonstrative evidence must meet the tests of relevancy and materiality, as well as the limitations imposed by rule 403.") (emphasis added).

²⁵ *Erazo v. State*, 144 S.W.3d 487, 489 (Tex. Crim. App. 2004) (citing *Montgomery v. State*, 810 S.W.2d 372, 389–90 (Tex. Crim. App. 1991 (en banc) (op. on reh'g))).

testimony.”²⁶ And while a diagram must be “properly proved,”²⁷ we have held that “even where a diagram is not exact in every detail, an objection goes to its weight, rather than its admissibility.”²⁸ These general principles apply to all demonstrative exhibits, diagrams²⁹ as well as computer animations.

As part of the unfair prejudice analysis, courts must also consider whether a demonstrative exhibit is “overly inflammatory.”³⁰ For

²⁶ MCCORMICK ON EVIDENCE § 214 (8th ed. 2020).

²⁷ See *Casselberry v. State*, 631 S.W.2d 542, 543 (Tex. App.—El Paso 1982, pet. ref’d) (“Since all of the information on the [diagram of the intersection] had been properly proved, it was admissible and properly went to the jury.”); *White v. State*, No. 01-89-00607-CR, 1990 WL 31589, at *4 (Tex. App.—Houston [1st Dist.] March 22, 1990, no pet.) (mem. op., not designated for publication) (“Where all of the information on the chart or diagram is properly proved, the diagram or chart itself is admissible.”).

²⁸ *Jackson v. State*, 477 S.W.2d 879, 880 (Tex. Crim. App. 1972) (“We fail to understand why the court initially refused to admit these drawings into evidence. Diagrams are admissible to explain and clarify a witness’ testimony. These drawings were not offered as exact scale replicas of the scene but were offered merely to show the layout of the apartment and make the officer’s testimony clearer. Any inaccuracy in the scale of the drawings would not, under the circumstances, affect their admissibility.”).

²⁹ See *Smith v. State*, 626 S.W.2d 843, 844 (Tex. App.—Corpus Christi 1981, no pet.) (holding that a diagram was admissible even though an underlying witness later admitted that it was “simplified” and “not an exact replica” because it was offered to explain and clarify testimony by showing the layout of a scene and both underlying witnesses testified that it fairly and accurately what it was purported to represent).

³⁰ *Milton*, 572 S.W.3d at 240 (“[A]s with jury argument, a demonstrative aid must not be overly inflammatory.”); see also *Simmons*, 622 S.W.2d at 113 (“We hold today that an object, such as a knife, that is not an exact replica or duplicate of the original is admissible if it is relevant and material to an issue in the trial *and is not overly inflammatory*, and the original, if available, would have been admissible at trial.”) (emphasis added).

instance, in analyzing the inflammatory nature of substantive visual evidence, we have looked to, among other things, the evidence's gruesomeness, level of detail, and perspective.³¹ In looking at these factors, a court can consider whether the visual evidence tends to improperly inflame the passions of the jury and cause them to resolve the case on an improper basis.³²

Judging the potentially inflammatory nature of a demonstrative exhibit is analogous to the way we have considered the potential prejudice associated with autopsy photos. For example, in *Rojas v. State*, a defendant challenged four autopsy photographs under Rule 403.³³ The first three photographs depicted gunshot wounds received by one victim and the last photograph displayed trauma to the pelvic area of another victim.³⁴ The defendant claimed that all the photographs were inadmissible under Rule 403 because they were gruesome, close-up, and in color.³⁵ We noted that autopsy photos are

³¹ *Sonnier v. State*, 913 S.W.2d 511, 518 (Tex. Crim. App. 1995).

³² *Id.* at 519.

³³ *Rojas v. State*, 986 S.W.2d 241, 249 (Tex. Crim. App. 1998).

³⁴ *Id.*

³⁵ *Id.*

generally admissible unless they depicted mutilation of the victim caused by the autopsy itself.³⁶

In *Rojas*, we held that the autopsy photos were admissible because they directly focused on the wounds that could be ascribed to the defendant, were not unnecessarily gruesome, and did not reveal injuries from the autopsy procedures.³⁷ In contrast, in *Terry v. State*, we held that autopsy photos depicting a “massive mutilation” of a child were inadmissible because they depicted “primarily what was done by the person who performed the autopsy rather than that alleged to have been done by the appellant.”³⁸

Similarly, we have also considered the potential emotional effect of demonstrative exhibits on the jury.³⁹ For example, in *Milton v. State*, we held that a demonstrative video of a lioness trying to eat a human

³⁶ *Id.* (citing *Santellan v. State*, 939 S.W.2d 155, 172 (Tex. Crim. App. 1997)).

³⁷ *Id.* at 249–50.

³⁸ *Terry v. State*, 491 S.W.2d 161, 163 (Tex. Crim. App. 1973).

³⁹ See *Milton*, 572 S.W.3d at 243–44; see also *Salazar v. State*, 90 S.W.3d 330, 338–39 (Tex. Crim. App. 2002) (holding that seventeen-minute memorial video of the victim set to the music of Enya and Celine Dion was inadmissible as victim-impact or victim-character evidence).

baby through protective glass was improper because of its potential inappropriate emotional effect on the jury.⁴⁰ Specifically, we recognized that the video could ‘unconsciously mislead’ the jury into punishing the robbery defendant for a much more heinous crime of attempting to eat a human baby.⁴¹ We have also held that a seventeen-minute memorial video of a capital murder victim set to the music of Enya and Celine Dion was inadmissible as victim-impact or victim-character evidence due to the potential to mislead the jury into an overly emotional response.⁴² Accordingly, an animation’s probative value must not be substantially outweighed by inflammatory aspects that may cause a jury to render a verdict on an improper basis.

Claims that a demonstrative exhibit relies upon speculation or factual inaccuracies fit more cleanly into a Rule 403 balancing analysis rather than an authentication or relevance analysis. Texas intermediate courts of appeals have generally viewed such claims through the lens of

⁴⁰ *Milton*, 572 S.W.3d at 243–44.

⁴¹ *Id.*

⁴² *Salazar*, 90 S.W.3d at 337.

Rule 403.⁴³ For instance, in *Venegas v. State*, the San Antonio Court of Appeals held that the probative value of a computer animation depicting an accident reconstruction expert's testimony was not substantially outweighed by potential unfair prejudice.⁴⁴ In that case, the State's expert described his team's efforts at diagramming and taking measurements of the scene.⁴⁵ Further, he described how he could use a pre-accident recording of the defendant's vehicle, captured by a camera at a nearby gas station, in conjunction with the placement of other cars in the recording and other fixed objects to determine the defendant's approximate speed at time of impact.⁴⁶ The expert described how he could apply time and distance constants to calculate the information in the computer animation regarding the car's speed

⁴³ See, e.g., *Castanon*, 2016 WL 6820559, at *3 (holding that trial court did not abuse its discretion by admitting traffic reconstruction made by police officer because small gaps in underlying information did not cause the probative value to be substantially outweighed by unfair prejudice); *Murphy*, 2011 WL 3860444, at *1 (holding that trial court did not abuse its discretion by admitting traffic reconstruction with slight inaccuracies as to the appearance of cars, background, and scale because the inaccuracies did not cause the probative value of the evidence to be substantially outweighed by unfair prejudice).

⁴⁴ *Venegas*, 560 S.W.3d at 347–48.

⁴⁵ *Id.* at 348.

⁴⁶ *Id.*

and its ultimate path.⁴⁷ The court of appeals held that the probative value of these exhibits was not substantially outweighed by the danger of unfair prejudice from speculation and inaccuracy because the exhibits were based upon calculations derived from quantifiable measurements.⁴⁸

In contrast, the First Court of Appeals, in *Harris v. State*, held that a trial court did not abuse its discretion in excluding a live-action video reenactment and separate computer animation based on concerns that they would be misleading and confusing to the jury.⁴⁹ First, the contested live-action video reenactment purported to show the defendant's viewpoint as she drove through a parking lot and struck the complainant.⁵⁰ However, the sponsoring expert admitted that the video misrepresented the defendant's viewpoint in the car and misrepresented the speed of the car.⁵¹ In addition, the expert admitted that he did not

⁴⁷ *Id.*

⁴⁸ *Id.* at 348.

⁴⁹ *Harris v. State*, 152 S.W.3d 786, 794 (Tex. App.—Houston [1st Dist.] 2004, pet. ref'd.).

⁵⁰ *Id.* at 790.

⁵¹ *Id.*

know the exact position of the complainant to support his position in the live-action video.⁵²

Separately, the contested computer animation in *Harris* depicted the opinion of the expert that the defendant had only run over the complainant's body once, in contrast to the State's evidence.⁵³ However, unlike the live-action video, the computer animation omitted any figure to represent the complainant.⁵⁴ Instead, the expert placed an 'X' to mark a bloodstain discovered next to the complainant's body.⁵⁵ But the expert testified that the defendant's car never drove through the bloodstain.⁵⁶ The trial court excluded the live-action video because he believed that the inaccuracies within the recreation led to a substantial danger of misleading or confusing the jury.⁵⁷ In addition, the trial court excluded the computer animation exhibit because he

⁵² *Id.* at 793.

⁵³ *Id.*

⁵⁴ *Id.* at 790.

⁵⁵ *Id.*

⁵⁶ *Id.*

⁵⁷ *Id.* at 793–94.

believed that the absence of a body and inclusion of a bloodstain marker within the animation would mislead or confuse the jury.⁵⁸

After reviewing the inaccuracies in the live-action video exhibit, the court of appeals upheld the trial court's decision to exclude the exhibit as within the realm of reasonable disagreement.⁵⁹ In addition, the court of appeals upheld the trial court's exclusion of the computer animation exhibit.⁶⁰ The court pointed out that the real issue was whether the defendant ran over the complainant's body more than once, not where the body was located when it was run over.⁶¹

Similarly, the Amarillo Court of Appeals, in the companion cases of *Lewis v. State* and *Hamilton v. State*, held that a computer animation was inadmissible due to its speculative nature.⁶² The animation purported to recreate the events surrounding a shooting from the

⁵⁸ *Id.* at 793.

⁵⁹ *Id.* at 794.

⁶⁰ *Id.*

⁶¹ *Id.*

⁶² *Lewis v. State*, 402 S.W.3d 852, 862–66 (Tex. App.—Amarillo 2013, pet. granted), *aff'd on other grounds*, 428 S.W.3d 860, 865 (Tex. Crim. App. 2014); *Hamilton v. State*, 399 S.W.3d 673, 680–85 (Tex. App.—Amarillo 2013, pet. ref'd.).

perspective of a lay witness.⁶³ On cross-examination, the eyewitness admitted that the animation was inaccurate in some respects, including: the lack of a window-screen in the animation, a different elevation for her apartment, different decibels for the gunshots, different body sizes for the human figures, and a different number of gunshots.⁶⁴ In addition, the creator of the animation admitted that some details had been omitted “because they require more memory to run the computer program.”⁶⁵

The court of appeals ultimately concluded that the animation was inadmissible because many details of the animations were completely unsupported by the record and “were provided by nothing more than pure speculation[.]”⁶⁶ Although the Amarillo Court of Appeals did not explicitly categorize its analysis under Rule 403, its overall analysis falls in line with the other Texas courts of appeals that have addressed this

⁶³ *Lewis*, 402 S.W.3d at 862; *Hamilton*, 399 S.W.3d at 681–82.

⁶⁴ *Lewis*, 402 S.W.3d at 862; *Hamilton*, 399 S.W.3d at 681–82.

⁶⁵ *Lewis*, 402 S.W.3d at 863; *Hamilton*, 399 S.W.3d at 682.

⁶⁶ *Lewis*, 402 S.W.3d at 865; *Hamilton*, 399 S.W.3d at 684.

issue using a 403-style analysis.⁶⁷ Accordingly, computer animations can be admissible if their probative value (i.e., their helpfulness to the jury) is not substantially outweighed by risk of unfair prejudice, misleading the jury, or confusing the issues.⁶⁸

So, a computer animation used as a demonstrative aid is admissible if its proponent shows that it: 1) is authenticated, 2) is relevant, and 3) has probative value that is not substantially outweighed by the danger of unfair prejudice.⁶⁹ In analyzing the exhibit's authenticity, the trial court should consider whether the exhibit is a fair and accurate portrayal of what its proponent claims it to be.⁷⁰ In determining relevance, the trial court should consider the helpfulness of the exhibit in illustrating testimony.⁷¹ Finally, in analyzing the exhibit's

⁶⁷ See, e.g., *Venegas*, 560 S.W.3d at 347–48; *Harris v. State*, 152 S.W.3d at 794; *Castanon*, 2016 WL 6820559, at *3; *Murphy*, 2011 WL 3860444, at *1.

⁶⁸ See, e.g., *Clark*, 529 S.E.2d at 536 (recognizing that an inaccurate portrayal within a computer animation can pose a high potential for misleading the jury and creating lasting impressions that unduly override other evidence); *Farner*, 66 S.W.3d at 209 (“If a computer animated portrayal is inaccurate, its probative value decreases and the likelihood that it will be subject to exclusion under [Tennessee] Rule 403 increases.”).

⁶⁹ See TEX. R. EVID. 401, 403, 901(a).

⁷⁰ TEX. R. EVID. 901(a); see MCCORMICK ON EVIDENCE § 214, 218 (8th ed. 2020).

⁷¹ *Milton*, 572 S.W.3d at 240 (citing MCCORMICK ON EVIDENCE § 214 (7th ed. 2016)).

probative value versus danger of unfair prejudice, the trial court should weigh its probative value (i.e., its helpfulness to the jury) with its potential for unfair prejudice, misleading the jury, or confusing the issues.⁷² As with any other trial court's ruling on an evidentiary matter, a trial court's ruling admitting demonstrative exhibits will not be disturbed absent a clear abuse of discretion.⁷³

The Computer Animations Were Properly Admitted as Demonstrative Evidence

Here, Appellant did not object that the underlying expert testimony and opinions were unreliable under Rule 702. Consequently, we are only concerned with the admissibility of the demonstrative exhibits themselves. We consider that question under the assumption that the expert testimony illustrated by the demonstrative exhibit was scientifically reliable.

⁷² See, e.g., *Clark*, 529 S.E.2d at 536 (recognizing that an inaccurate portrayal within a computer animation can pose a high potential for misleading the jury and creating lasting impressions that unduly override other evidence); *Farner*, 66 S.W.3d at 209 ("If a computer animated portrayal is inaccurate, its probative value decreases and the likelihood that it will be subject to exclusion under [Tennessee] Rule 403 increases.").

⁷³ See *Weatherred v. State*, 15 S.W.3d 540, 542 (Tex. Crim. App. 2000).

As will be discussed in more detail below, the State authenticated the contested exhibits. The State further established that they were relevant and had probative value that was not substantially outweighed by the danger of unfair prejudice. Kropp's testimony established that the exhibits were fair and accurate representations of his expert opinion. The exhibits were helpful illustrations of the complex mix of forensic evidence and expert testimony. And finally, the exhibits' probative value was not substantially outweighed by the danger of unfair prejudice. Accordingly, the court of appeals properly upheld the trial court's admission of the animations.

Authentication

First, the State properly authenticated the exhibits.⁷⁴ As the trial court told the jury, the exhibits were "a visualization of the expert's opinion." And, as shown by Kropp's explicit testimony, the exhibits fairly and accurately reflected what they purported to reflect. Kropp specifically testified that the exhibits accurately depicted what he intended them to and had not been altered in any way. He also testified

⁷⁴ See TEX. R. EVID. 901(a).

that the exhibits fairly and accurately represented what the available evidence showed. Accordingly, they were authenticated by the explicit testimony of their sponsoring witness.⁷⁵

Relevance

Next, the demonstrative exhibits were relevant because they assisted the trier of fact in understanding the testimonial and documentary evidence in a concise and easy-to-understand form.⁷⁶ Similar to a blackboard diagram of a crime scene drawn by a witness to illustrate his testimony, the animation in this case tracked Kropp's conclusions and testimony for the jury in an easy-to-follow visual form.⁷⁷ It did this by combining the accident reconstruction evidence of

⁷⁵ See *Vollbaum*, 833 S.W.2d at 657 ("An item of demonstrative evidence must be properly identified, i.e., a showing that the matter in question is what *its proponent claims*." (emphasis added)); see also *Hartsock*, 322 S.W.3d at 779 ("Demonstrative evidence must be properly identified by showing that the item in question *is what its proponent claims* as opposed to any idea of speculation, conjecture, or presumption of what the exhibit represents.") (emphasis added); *Casselberry*, 631 S.W.2d at 543 ("Since all of the information on the [diagram of the intersection] had been properly proved, it was admissible and properly went to the jury.").

⁷⁶ TEX. R. EVID. 401; see also *Milton*, 572 S.W.3d at 240 (citing MCCORMICK ON EVIDENCE § 214 (7th ed. 2016)); *Simmons*, 622 S.W.2d at 113; *Torres*, 116 S.W.3d at 213; *Hartsock*, 322 S.W.3d at 779.

⁷⁷ See *Jackson*, 477 S.W.2d at 880 ("We fail to understand why the court initially refused to admit these drawings into evidence. Diagrams are admissible to explain and clarify a witness' testimony. These drawings were not offered as exact scale replicas of the scene but were offered merely to show the layout of the apartment and make the officer's testimony clearer.").

tire tracks and acceleration patterns with the medical evidence of Delorme's injuries and the forensic evidence of Delorme's skin, scalp, and DNA under certain sections of Appellant's vehicle in one short presentation. In doing so, the animation provided a digestible aid that could illustrate the testimony of multiple witnesses in a simple experience. Further, it provided a clear understanding of the State's theory of the case and highlighted how Appellant's version of events was inconsistent with the physical evidence. Accordingly, the computer animations were relevant as pieces of demonstrative evidence.

Probative Value vs. Danger of Unfair Prejudice

Finally, the probative value of the exhibits was not substantially outweighed by the danger of unfair prejudice.⁷⁸ Generally, all four traditional factors for Rule 403 analysis weigh in favor of admissibility. As relevant to the specific issues in this case, the exhibits were not overly inflammatory.⁷⁹ They accurately reflected the objective evidence. And the stated assumptions underlying the placement of the

⁷⁸ See TEX. R. EVID. 403.

⁷⁹ See *Milton*, 572 S.W.3d at 240.

victim's body prior to, during, and after the collision did not unduly increase the danger of misleading the jury or confusing the issues.⁸⁰

Probative Value

As we described above, the exhibits were probative because they illustrated the testimony of multiple witnesses in a simple visual experience. Being fair and accurate depictions of Kropp's opinions, they allowed the jury to visualize the plausibility of the State's theory of the case in an easy-to-understand form. In addition, they provided a visual emphasis to Kropp's conclusions that could be used to weigh the plausibility of Appellant's later account of the events in question as they related to the position of his truck and general location of Delorme in the acceleration pattern.

In this way, the probative value of the animations is similar to the probative value of a contested in-court demonstration analyzed by the Fourteenth Court of Appeals in *Wright v. State*.⁸¹ In *Wright*, the prosecutor attempted to demonstrate the State's theory of a murder by

⁸⁰ See *Venegas*, 560 S.W.3d at 347–48.

⁸¹ See *Wright*, 178 S.W.3d at 923–24.

bringing a bed into the courtroom and physically demonstrating the way that the State's testifying witness believed the defendant stabbed the victim.⁸² According to the court of appeals, the demonstration had probative value because "it enabled the jury to visually evaluate the plausibility of both the State's theory and appellant's self-defense claim."⁸³ Because of this, the demonstration "conveyed the evidence more effectively than if a witness had merely described it."⁸⁴ Similarly, the animations in this case provided a visual medium for the jury to evaluate the plausibility of the State's case and its relation to the Appellant's counter-version of events. Accordingly, we believe that this factor weighs in favor of the admissibility of the exhibits.

Danger of Unfair Prejudice

The exhibits also did not have an undue tendency to suggest a decision by the factfinder on an improper basis. The exhibits were not overly inflammatory.⁸⁵ In fact, the exhibits were the least gruesome

⁸² *Id.* at 912–15.

⁸³ *Id.*

⁸⁴ *Id.* at 294.

⁸⁵ *See Milton*, 572 S.W.3d at 240.

depiction of Delorme offered into evidence by the State. Pictures of Delorme's body at the scene and during the autopsy showed blood, gore, and grisly injuries.⁸⁶ The animation, meanwhile, showed a nondescript, expressionless, and motionless representation of Delorme only marginally more detailed than a stick figure.⁸⁷ And, unlike the crime scene and autopsy photos, the animation does not attempt to show the actual injuries and merely depicts opinions regarding the way the injuries were sustained.

This, again, makes the exhibits similar to the contested in-court demonstration in *Wright*.⁸⁸ In *Wright*, while analyzing factors that kept the in-court demonstration from impressing the jury in an irrational way, the court of appeals noted that the demonstration "was less graphic than the actual event."⁸⁹ To support this, the court of appeals pointed out

⁸⁶ State's Trial Exhibits 5-7, 9-18, 29-30, and 34-44. We recognize that autopsy photos are generally admissible "unless they depict mutilation of the victim caused by the autopsy itself." *Rojas*, 986 S.W.2d at 249 (citing *Santellan*, 939 S.W.2d at 172).

⁸⁷ The animations also do not contain dramatic camera angles, sound effects, or a soundtrack. See also *Salazar*, 90 S.W.3d at 340 (Keller, P.J., concurring) (agreeing that the memorial video at issue in the case was inadmissible because the demonstrated evidence was presented in a manner designed to have an unduly emotional impact).

⁸⁸ *Wright*, 178 S.W.3d at 926.

⁸⁹ *Id.* at 925-26.

that the State did not attempt to reproduce the nearly 193 stab wounds, did not attempt to recreate the “gruesome, bloody scene” depicted in photographs, and did not attempt to reproduce alleged sexual aspects of the offense.⁹⁰ Similarly, in this case, the exhibits did not attempt to recreate Delorme’s injuries or any other gruesome aspects of the scene.

Moreover, the exhibits accurately reflect the objective evidence and are not based on speculation that might have misled or confuse the jury.⁹¹ Appellant does not claim that the animation inaccurately reflects the movements of Appellant’s truck or the positioning of the buildings in the animation—nor could he. As was the case with the contested exhibits in *Venegas*, the State established in this case that all of the details in the exhibits were based on calculations derived from objective data and quantifiable measurements.⁹² Officer Thompson, who collected the underlying measurements, testified regarding his measurement collection and described the process of picking fixed reference points of the scene with his range finder. He noted the 28

⁹⁰ *Id.* at 926.

⁹¹ *See Venegas*, 560 S.W.3d at 347–48.

⁹² *See id.*

separate points of reference that were collected on scene and described the length and unique curvature of the accelerating tire marks leading to Delorme's body. Kropp described using Thompson's underlying data, the forensic evidence found under Appellant's truck, photos from the scene, and Fries' autopsy report to construct the animations. In addition, Kropp described his 15 field acceleration tests to create the "most accurate speed" for the animation. While Kropp and Thompson did not have the benefit of a close-in-time video like the expert in *Venegas*, they had more quantifiable data including the autopsy report, forensic evidence, and the clear tire marks demonstrating curvature, vehicle control, and acceleration patterns.⁹³

Further, Kropp's testimony distinguishes these exhibits from the inadmissible exhibits in *Lewis* and *Hamilton* because Kropp was able to justify all of the details within the exhibits with explanations based in the objective evidence.⁹⁴ In *Lewis* and *Hamilton*, the animation did not account for a window screen, had an inaccurate elevation, contained

⁹³ See *Venegas*, 560 S.W.3d at 347–48.

⁹⁴ See *Lewis*, 402 S.W.3d at 863–65; *Hamilton*, 399 S.W.3d at 684.

inaccurate gun decibels, an inaccurate number of gun shots, and contained three identical figures in contrast to witness testimony that the subjects had different body types.⁹⁵ The expert in *Lewis* and *Hamilton* even admitted that some details had been intentionally left out to save memory on the computer program.⁹⁶

While Appellant centers his arguments on the placement of the depiction of Delorme within the animation, Kropp's placement of the Delorme figure was supported by objective scientific evidence. As Kropp explained, Delorme's body was discovered about 85 feet from the beginning of the accelerating tire marks. There was no forensic evidence that the body had traveled on the hood of the car prior to being run over, and there was every indication that the body traveled from the front to the back of the undercarriage of the truck. From the medical examiner's testimony, if the body had been dragged by the Appellant's truck, it would have been for only a short distance of about 10 feet. As Kropp explained, that combined evidence justified placing the Delorme

⁹⁵ *Lewis*, 402 S.W.3d at 862; *Hamilton*, 399 S.W.3d at 681–82.

⁹⁶ *Lewis*, 402 S.W.3d at 863; *Hamilton*, 399 S.W.3d at 682.

animation within a short proximity of where the body ended up rather than closer to where Appellant's truck started.

Even though Appellant testified that Delorme was standing closer to his truck than the exhibits depicted, that testimony was not a basis for Kropp's testimony or conclusions and was even contradicted by Kropp's rebuttal testimony as not reflective of the objective evidence. In addition, Appellant questioned Kropp in front of the jury regarding the placement of the Delorme figure and Kropp was candid regarding his exact reasons for the placement of the Delorme animation. Accordingly, any perceived inaccuracies were made very apparent to the jury, lessening the potential for their improper use.⁹⁷

Ultimately, Appellant's core concern is that the exhibits carried a potential to implicitly convey to the jury that the victim did not engage in provocative behavior towards the defendant because the exhibits showed no behavior on the part of the victim at all. Appellant's argument is well-taken. But when considering the content of each

⁹⁷ MCCORMICK ON EVIDENCE § 214 (8th ed. 2020) (In discussing diagrams, "[w]hen a trial court has exercised its discretion to admit, it will rarely be found in error. This is particularly true if the potentially misleading features have been pointed out by witnesses for the proponent or could have been exposed on cross-examination.").

exhibit, the human figure is clearly not meant to convey any information about the victim's behavior. One of the three exhibits barely even features a human figure. And the lack of any physical reaction by the figure in the other two exhibits, prior to, during, and after the collision, as well as absence of any depiction of the wounds suffered by the victim, minimized the potential of the jury to regard the exhibit as anything other than an illustration of the opinion testimony. To the extent that the use of a stationary figure to represent the victim could have implicitly suggested to the jury that the victim did not engage in aggressive behavior, the danger of that unfair prejudice was not substantial when considering the context in which the stationary figure was used in the exhibit.⁹⁸ This factor weighs in favor of admission.

Time to Develop the Exhibits

The time needed to develop the contested exhibits did not unfairly prejudice the defendant because the presentation of the exhibits did not

⁹⁸ By way of contrast, the excluded exhibit depicting Appellant's point of view while driving carried with it significant danger of unfair prejudice. That exhibit necessarily focused more on Appellant's point of view rather than the opinion testimony regarding the travel of the truck. It required a great deal of speculation regarding where Appellant would have been looking as he drove as well as centering the viewer upon the behavior or non-behavior of the victim. That exhibit was much more like the inadmissible video re-creation of the defendant's point of view in *Harris*. See *Harris*, 152 S.W.3d at 793.

distract the jury from consideration of the charged offense. Rather, the presentation of the evidence fixed the jury's focus of the evidence underlying the State's theory of the case. The animation directly related to the State's substantive proof of the underlying offense and could not have distracted the jury regardless of the required time to present the results.⁹⁹

Moreover, the exhibits themselves each only last a matter of seconds. The time devoted to the admissible testimony regarding the accident and the facts supporting the expert opinions in the case far exceeded the time necessary to explain the process by which the exhibits in this case were created and to display them before the jury. Accordingly, this factor favors admission.

Need for the Exhibits

Finally, the State had at least some need for the contested exhibits. As in *Wright*, the exhibits in this case were a much more

⁹⁹ Regarding the "time needed to develop" factor at issue in a Rule 403 analysis, we have previously made clear that we are only concerned with how the time needed to develop the evidence distracts the jury from the charged offense. See *State v. Mechler*, 153 S.W.3d 435, 441 (Tex. Crim. App. 2005). If the demonstrative exhibit merely focuses the jury's attention on evidence proving the charged offense, then the jury cannot be distracted by the exhibit regardless of the time required to develop the particular evidence. See *id.*

forceful and clear illustration of the State's theory than mere testimony and almost certainly heightened the jury's comprehension of the State's theory despite the fact that they were duplicative of other evidence.¹⁰⁰ They provided a useful tool for the jury to evaluate the plausibility of both the State's and Appellant's respective theories of the case. This factor weighs at least slightly in favor of admission.

No *Per Se* Prohibition Against the Depiction of Human Behavior in Demonstrative Exhibits

Appellant argues that the exhibits were unduly prejudicial and should have been excluded because the inclusion of Delorme's body in the animation depicted human behavior. According to Appellant, this Court has established a *per se* bar to recreations of human behavior and the exhibits violated this rule. We disagree.

First, Appellant's argument centers on general language from our opinion in *Miller v. State*, but his reliance is misplaced.¹⁰¹ *Miller* did not deal with an animation depicting human behavior; rather, it dealt with a videotape that showed a series of pictures of a route taken by the

¹⁰⁰ *Wright*, 178 S.W.3d at 928.

¹⁰¹ *Miller v. State*, 741 S.W.2d 382, 388 (Tex. Crim. App. 1987).

defendant to where the victims in the case were murdered.¹⁰² Though the defendant argued on appeal that the exhibit was based upon speculation, we held that error had not been preserved.¹⁰³ We did not decide *Miller* on the issue of whether depictions of human behavior are too speculative.¹⁰⁴

Indeed, Appellant relies upon language in *Miller* that was not central to the holding of the case. After the Court determined that the defendant's challenge to the video had not been preserved, we noted a previous statement from the Fort Worth Court of Appeals in *Lopez v. State* regarding staged, re-enacted criminal acts.¹⁰⁵ The court of appeals had stated that "[a]ny staged, re-enacted criminal acts or defensive issues involving human beings are impossible to duplicate in every minute detail and are therefore inherently dangerous, offer little in substance and the impact of re-enactments is too highly prejudicial

¹⁰² *Id.*

¹⁰³ *Id.*

¹⁰⁴ *Id.*

¹⁰⁵ *Id.*

to insure the State or the defendant a fair trial.”¹⁰⁶ While we did note the persuasiveness of this logic, *Miller* did not involve staged, re-enacted criminal acts. And, regardless, we had already resolved the pertinent issue on preservation grounds.¹⁰⁷ Accordingly, our statement in *Miller* was dicta.¹⁰⁸

Second, the exhibits in this case did not attempt to recreate human behavior. The figure representing Delorme did not independently move at all and appears solely placed to demonstrate the details of the truck’s path through the collision, not Delorme’s actions prior to impact. Unlike even the animated human figures in *Lewis* and *Hamilton*, the Delorme figure was not engaging in any other kind of behavior.¹⁰⁹ Rather, the figure simply served as a marker for the place that Kropp believed the

¹⁰⁶ *Lopez v. State*, 651 S.W.2d 413, 414 (Tex. App.—Fort Worth 1983) opinion withdrawn by *Lopez v. State*, 667 S.W.2d 624 (Tex. App.—Fort Worth 1984), which opinion was reversed on other grounds, *Lopez v. State*, 664 S.W.2d 85 (Tex. Crim. App. 1984).

¹⁰⁷ *Miller*, 741 S.W.2d at 388.

¹⁰⁸ See *Oliva v. State*, 548 S.W.3d 518, 524 (Tex. Crim. App. 2018) (“[L]anguage in an opinion can be *dictum* if it is broader than necessary to resolve the case. This is so because a court might not have carefully considered fact situations that vary substantially from the one before it.”).

¹⁰⁹ Cf. *Lewis*, 402 S.W.3d at 862; *Hamilton*, 399 S.W.3d at 681–82.

evidence showed the strike most likely occurred as well as how the car traveled over the body.

The animation appears just detailed enough to illustrate the expert's conclusions without extraneous and speculative detail.¹¹⁰ It is, in effect, a moving diagram that was used to illustrate the expert's conclusions about the truck's movement through the collision with the victim. There is no independent movement of the computer figure's limbs beyond what might be expected from a plastic figure. The figure remains motionless and does not react to the truck as it approaches him. When the truck hits the figure, the figure remains unnaturally rigid throughout the impact. Accordingly, rather than a recreation of human behavior, the animation relies upon a figure that more closely resembles a mannequin or doll, which courts have regularly approved as useful tools for demonstrative purposes.¹¹¹

¹¹⁰ See *Milton*, 572 S.W.3d at 240; see also *Lewis*, 402 S.W.3d at 861–65.

¹¹¹ See, e.g., *Reyna v. State*, 797 S.W.2d 189, 193 (Tex. App.—Corpus Christi 1990, no pet.) (noting that the use of anatomically correct dolls in a sexual assault case “as demonstrative evidence to assist the jury in understanding the oral testimony of the witness is permissible.”); *Perez v. State*, 925 S.W.2d 324, 326–27 (Tex. App.—Corpus Christi 1996, no pet.) (same); *Torres*, 833 S.W.2d at 657 (determining that a Styrofoam model of a woman's head was properly used as demonstrative evidence during the testimony of a medical examiner).

Finally, Appellant argues that the lack of a knife in the animated figure's hand rendered the demonstrative exhibits inaccurate. However, adding the knife would have added speculation to the exhibit by changing the focus of the demonstrative aid. While photos did show a knife and sheath located near Delorme's body after his death, none of the State's witnesses testified to their whereabouts immediately preceding Delorme's death. And although Appellant later testified to Delorme holding a knife in the parking lot prior to impact, that testimony was entered into evidence after the admission of the exhibits and was not a basis for Kropp's expert conclusions.

The animations were offered to illustrate the testimony about how the truck accelerated and ran over the victim, not to suggest that the victim remained motionless and facing to the left as Appellant's truck accelerated towards him. Given this, we cannot say that the absence of the knife substantially increased the danger of any unfair prejudicial effect of the animation. Accordingly, we hold that the trial court did not abuse its discretion in determining that the exhibits in this case had probative value that was not substantially outweighed by the danger of unfair prejudice.

Limiting Instruction

Appellant also argues that a limiting instruction should be required at the time the computer animation exhibits are introduced. According to Appellant, such an instruction should clarify that the demonstrative exhibit is not probative evidence itself. While we agree that the trial court's instruction prior to the display of the demonstrative exhibits in this case could have been more targeted on that point, any deficiencies in the instruction given by the trial court do not alter our analysis about the admissibility of the exhibits.

Generally, a limiting instruction clarifying the limited basis for the consideration of evidence can ameliorate the potential unfair prejudice in the admission of a computer animation.¹¹² But by rule, the responsibility for requesting such an instruction falls to the parties. Rule 105(a) allows for an instruction, upon request, that restricts evidence to its proper scope if it is offered for a limited purpose.¹¹³ In giving a

¹¹² See, e.g., *Garcia v. State*, 201 S.W.3d 695, 704 (Tex. Crim. App. 2006) (in analysis under Texas Rule of Evidence 403, limiting instructions can diminish potential prejudice produced by evidence); *Henderson v. State*, 962 S.W.2d 544, 567 (Tex. Crim. App. 1997) ("whether a limiting instruction would have been effective in preventing the jury from being influenced by the evidence's prejudicial aspects" is a factor in analysis under Texas Rule of Evidence 403).

¹¹³ TEX. R. EVID. 105(a).

limiting instruction prior to the display or admission of a demonstrative exhibit, the trial court reminds the jury that the demonstrative evidence may only be considered as an illustration of other evidence. Other state courts have explicitly required trial courts to give such limiting instructions prior to the publishing of a computer animation.¹¹⁴

We have previously declined to require the trial court to *sua sponte* give a contemporaneous limiting instruction regarding extraneous offenses. In *Delgado v. State*, we reasoned that the decision to request a limiting instruction concerning the proper use of certain evidence may be a matter of trial strategy.¹¹⁵ We observed that an attorney might reasonably choose not to request the instruction because doing so might emphasize the evidence at issue.¹¹⁶ This reasoning applies equally to demonstrative exhibits. Additionally, the rule regarding limiting instructions also places the burden upon the parties to request an

¹¹⁴ See *Harris*, 13 P.3d at 495 (“The court should give an instruction, contemporaneous with the time the evidence is presented, that the exhibition represents only a re-creation of the proponent’s version of the events; that it should in no way be viewed as an actual recreation of the crime, and like all evidence, it may be accepted or rejected in whole or in part.”); see also *Clark*, 529 S.E.2d at 536–38.

¹¹⁵ *Delgado v. State*, 235 S.W.3d 244, 250 (Tex. Crim. App. 2007).

¹¹⁶ *Id.*

instruction and not the trial court to give one. Consequently, we reject Appellant's argument that trial courts must *sua sponte* instruct the jury on the nature of the demonstrative exhibit at the time it is admitted or displayed.

As mentioned above, prior to display of the exhibits, the trial court told the jury:

Ladies and gentlemen of the jury, the State has introduced an animation purporting to recreate the events alleged in the indictment. The animation is a visualization of the expert's opinion. It is admitted for the sole purpose of aiding the jury and understanding the events, if any, which happened and may be considered by the jury only to the extent that the jury believes beyond a reasonable doubt that other evidence introduced by the State supports the events as depicted in the animation.

We agree with Appellant that the instruction, which appears patterned after an extraneous offense instruction, should have explicitly stated that the demonstrative exhibits in this case were not evidence themselves. Nevertheless, this discrepancy did not render the exhibits themselves inadmissible.

Here, the instruction explained that the animation was simply a visualization of the expert's opinion. In addition, it required the jury to believe that an illustrated detail was supported beyond a reasonable

doubt by other admitted evidence prior to considering it. Though the instruction did not explicitly tell the jury that the demonstrative exhibits were not themselves evidence, it did tell the jury not to consider them unless it believed the testimony they were based on. As discussed above, the trial court did not abuse its discretion to admit the exhibits because the probative value of the exhibits was not substantially outweighed by the danger of unfair prejudice. In that light, the trial court's instruction here could only limit any lingering potential for unfair prejudice from the exhibits.¹¹⁷ Any deficiencies in the trial court's wording of its limiting instruction did not harm Appellant.¹¹⁸

Conclusion

A computer animation, used to illustrate an expert's testimony, is a demonstrative exhibit like any other. Assuming that the demonstrative exhibit is based upon scientifically reliable opinion testimony, it may be admitted if it: 1) is authenticated, 2) is relevant,

¹¹⁷ See, e.g., *Garcia*, 201 S.W.3d 695 at 704; *Henderson*, 962 S.W.2d at 567; see also *Harris*, 13 P.3d at 495; *Clark*, 529 S.E.2d at 536–38.

¹¹⁸ Cf. *Abdnor v. State*, 871 S.W.2d 726, 738 (Tex. Crim. App. 1994) (noting in the context of the admission of extraneous offenses that the lack of a limiting instruction leaves any prejudice resulting from the introduction of the prejudicial evidence unabated); see also *Thrift v. State*, 176 S.W.3d 221, 224 (Tex. Crim. App. 2005) ("On appeal, [the Court of Criminal Appeals] generally presume[s] the jury follow[ed] the trial court's instructions in the manner presented.").

and 3) has probative value not substantially outweighed by the danger of unfair prejudice. Because the State demonstrated that the exhibits in this case were authenticated, were relevant, and had probative value that was not outweighed by unfair prejudice, the trial court did not abuse its discretion to admit them. Accordingly, we affirm the judgment of the court of appeals.

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