

The Computer as Advocate: An Approach to Computer-Generated Displays in the Courtroom

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INTRODUCTION

It was a first in California: a rough, three-minute computer animation was used by the prosecution to illustrate its theory of a murder case.¹ It helped to convict theater operator Jim Mitchell of killing his brother, and some commentators say that this kind of technology will aid jurors in understanding complex case theories by reducing them to coherent illustrations.² The trial of O.J. Simpson focused more attention on the use of computers at trial.³ The entire courtroom was rigged for courtroom computer display by the inVzn company,⁴ and both sides hinted that they were considering the use of computer animations to aid the jury in understanding their cases.⁵ However, some commentators believe this so-called "aid" may simply be manipulation, placing the jury wholly in the hands of an omnipotent computer expert.⁶ The clash between these two beliefs will shape how the computer enters our civil and criminal courts in the near future.

In the 1990's, our culture has become computer crazed. We constantly hear such terms as "information superhighway," the "net," and "multimedia." The legal profession is no exception. A growing number of attorneys take advantage of more affordable three-dimensional animations to present their cases to juries.⁷ An ability to create animations on desktop computers, combined with falling hardware prices, have contributed to a surge of courtroom animations.⁸ With a 486-based personal computer and a program such as Autodesk's 3-D Studio, even tightly budgeted prosecutors' offices can afford animations.⁹

Still, with all the visibility of computer technology, there remains an air of mystery about the computer. Computerization is seen as a magic world, ruled by the wizards who operate the machines.¹⁰ The legal profession is susceptible to this view of computers, mainly because of the misperception of computers as "science" and because lawyers are generally not highly trained in computer operation.¹¹ This pigeonholing of computers as

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1. Mark I. Pinsky, *Jury Out on High-Tech Courtroom*, L.A. TIMES, Dec. 17, 1993 at A1.

2. *Id.*

3. *O.J. Case: High-tech, High Drama: Animation Is Like Movies in School: 'Cool'*, USA TODAY, Aug. 18, 1994, at A4 [hereinafter *High-tech, High Drama*].

4. Guy Webster, *Gilbert Firm's Computer Gear Will Speed Simpson Trial*, ARIZ. REPUBLIC, Aug. 28, 1994, at H4.

5. *High-tech, High Drama*, *supra* note 3, at A4. Ultimately, however, neither side chose to use animations in their cases.

6. *Id.*

7. Jeanette Borzo & Kelley Damore, *Low-Cost 3-D Animation Earns Its Day in Court*, INFO WORLD, Sept. 13, 1993, at 1.

8. *Id.* at 20.

9. *Id.*

10. *See Perma Research & Dev. v. Singer Co.*, 542 F.2d 111, 124 (2d Cir. 1976).

11. Michael Hoenic, *Computer Simulations and Other Weapons*, N.Y. L.J., Mar. 8, 1993, at 3.

strictly "scientific" means that at trial, lawyers may be fearful of using computer displays, waiting for other disciplines to set up the "scientific foundation" of computers for use in the courtroom.¹² Judges, also unfamiliar with the workings of computers, subject lawyers who use computers at trial to the strict foundation requirements for scientific evidence.¹³ Others may have a friendlier view toward computer illustrations, and only require that lawyers pass the hurdle of relevancy.¹⁴ The only clear fact is that the standards involved in admitting computer-created illustrations are unclear.¹⁵ It should be noted here that part of the confusion about computer use is tied to the use of language. The law uses the terms "simulation," "animation," and "illustration" interchangeably, and uses all of them to describe the output of a computer program, visual in nature, that is to be shown to the trier of fact. In this Note, the term "computer display" or "computer-generated display" will be used to encompass this definition.

These computer-generated displays have generally been regarded by judges and attorneys as "evidence." This view ignores the fact that a computer can serve many different purposes. One of these is to illustrate an attorney's *argument*. The purpose of this Note is twofold: first, to reveal the confusion that results when all computer displays are regarded as "evidence"; second, to distinguish between computer displays as *evidence* and computer displays as *argument*. Part I will examine how courtrooms currently handle the introduction of so-called computer "evidence." Part II will explore the various pitfalls that may await litigators attempting to get a computer display into evidence. In light of the difficulties demonstrated in Parts I and II, Part III will present a new and better way of thinking about legal computer use. This will lead to a suggestion for attorneys seeking to place their computer displays before the eyes of a jury. In the end, the computer's role in the courtroom will be placed in a clearer light.

I. THE CURRENT TREATMENT OF COMPUTER DISPLAYS

There are many ways of thinking about how to deal with computers in the courtroom, and no clear standards have been set.¹⁶ Some commentators have suggested that the well-settled standards involved in the admission of computer business records may be helpful.¹⁷ However, most of the current judicial thinking seems to be split between treating computer simulations under the scientific standards of evidence from *Frye v. United States*¹⁸ and treating them under the relevancy standard as modeled in the Federal Rules of Evidence ("FRE").¹⁹ Correspondingly, whether a computer simulation is determined to be scientific evidence or demonstrative evidence will have a major impact

12. *Id.*

13. See Vicki S. Menard, *Admission of Computer Generated Visual Evidence: Should There Be Clear Standards?*, 1993 SOFTWARE L.J. 325, 328, available in WESTLAW, JLR Library.

14. Elaine M. Chaney, Note, *Computer Simulations: How They Can Be Used at Trial and the Arguments for Admissibility*, 19 IND. L. REV. 735, 740-41 (1986).

15. See Lory Dennis Warton, Comment, *Litigators Bite the Apple: Utilizing Computer-Generated Evidence at Trial*, 41 BAYLOR L. REV. 731, 740 (1989).

16. *Id.*

17. *Id.* at 741.

18. 293 F. 1013 (D.C. Cir. 1923). In the federal courts, *Frye* has been overruled by *Daubert v. Merrell Dow Pharmaceutical*, 113 S. Ct. 2786 (1993). However, since *Frye* is still used in a significant number of state courts, both standards will be discussed.

19. FED. R. EVID. 401-403.

on the standard used to evaluate it.²⁰ In general, the standards of scientific evidence will tend to be stricter, even if the courts abandon the *Frye* standard and opt for using the relevancy standards set forth in the FRE and *Daubert v. Merrell Dow Pharmaceutical*.²¹ This Part will first examine the use of the computer as a scientific expert. Second, it will look at the standards invoked if the simulation is determined to be demonstrative evidence.

A. The Computer as the Expert

This Section will evaluate computer simulations under the *Frye*, FRE, and *Daubert* standards. The overruling of *Frye* by *Daubert*²² obviously has implications in this area, and the possible effects will be briefly discussed. However, a full exploration of the way in which *Daubert* will affect the area of scientific evidence is beyond both the scope and the ultimate purpose of this Note. It should be noted, however, that *Daubert* is only binding on the federal courts. State courts enamored with *Frye* may not be abandoning it anytime soon, so any discussion of scientific evidence must still address its precepts.

I. Displays Under *Frye*

Frye has been the approach for determining the admissibility of scientific evidence since 1923.²³ This standard has been adopted by most courts in dealing with evidence derived from novel scientific techniques.²⁴ An extra burden is placed upon "novel" scientific evidence, in that it must be generally accepted. As *Frye* noted:

Just when a scientific principle or discovery crosses the line between the experimental and demonstrable stages is difficult to define. Somewhere in this twilight zone the evidential force of the principle must be recognized, and while courts will go a long way in admitting expert testimony deduced from a well-recognized scientific principle or discovery, the thing from which the deduction is made must be sufficiently established to have gained general acceptance in the particular field in which it belongs.²⁵

The *Frye* test therefore boils down to two prongs. First, a court must determine the relevant field or community to which the science belongs.²⁶ This may be difficult since many scientific techniques do not fall neatly into a single academic discipline.²⁷ Second, once the field has been identified, a court must determine whether the underlying principle and technique have been generally accepted by members of that field.²⁸

One can see, hypothetically, that computers pose a nightmare for the trial court on the first prong of *Frye*, as they are a tool used not just across all disciplines of science but also across all of society. This confusion continues into the second prong; while an underlying principle (such as projectile trajectory) may be a long-standing principle in

20. See Craig Murphy, Comment, *Computer Simulations and Video Re-enactments: Fact, Fantasy and Admission Standards*, 17 OHIO N.U. L. REV. 145, 152 (1990).

21. 113 S. Ct. 2786; see Menard, *supra* note 13, at 328. Note that a judge who confuses whether a simulation is scientific and "expert" or demonstrative can make life harder than necessary for the trial attorney.

22. 113 S. Ct. 2786.

23. Ronald J. Marzullo-LaRussa, *Computer-Generated Evidence: Admissibility*, 20 REV. JUR. U.I. 121, 136 (1985).

24. Robert B. Reagan, *The Admissibility of Computer Simulations as Novel Scientific Evidence: An Analysis Under the Frye and Relevancy Standards*, 1991 WL 330753, at *3.

25. *Frye*, 293 F. at 1014.

26. Reagan, *supra* note 24, at *2.

27. *Id.*

28. *Id.*

a discipline, using a computer in conjunction with this basic principle may be "novel" in the field. In addition, while using a computer may be "novel" to a particular discipline, another field (such as computer engineering) may regard this same technique as basic and "generally accepted."

Most courts, however, have agreed that the perceived benefit of *Frye*—that its conservative nature excludes evidence not proven to be scientifically accepted—outweighs these possible problems.²⁹ There is no clear percentage or standard for finding the existence of "general acceptance."³⁰ The decision is left to the trial court, and three methods of proving "general acceptance" have been predominantly employed: (1) expert testimony, (2) scientific and legal writing, and (3) prior judicial opinions.³¹ Of these, expert testimony is the most widely utilized method of proof.³²

A recent example of a case that has admitted a computer display under *Frye* standards is *Commercial Union Insurance Co. v. Boston Edison Co.*³³ This case, which involved an overcharge by a steam utility, held that a computer modeling program of energy usage, called TRACE, was "generally accepted" when it had been "used by engineers and [heating, ventilation, and air conditioning] design professionals to model energy consumption in over 40,000 buildings."³⁴ The opponent of the display, however, maintained that the program had only been widely accepted in projecting future energy consumption, not in re-creating past consumption.³⁵ The court, however, did not feel that the use of "historical rather than hypothetical" facts warranted inadmissibility.³⁶ This case illustrates that use of a computer technique may be both generally accepted for one purpose and novel for another.

There have been two cases—*Schaeffer v. General Motors*³⁷ and *Starr v. Campos*³⁸—which have banned admission of computer displays under a *Frye* standard of inquiry.³⁹ Both *Schaeffer* and *Starr* indicated that the initial data fed into the computer displays raised major questions. *Schaeffer* stated that "[o]ur concern is not with the precision of electronic calculations, but with the accuracy and completeness of the initial data and equations which are used as ingredients of the computer program."⁴⁰ *Starr* stated that "the court may take judicial notice of the ability of a properly programmed computer to perform mathematical computation and of the general acceptance of the underlying principle of the method [of accident reconstruction]."⁴¹

The courts astutely observed that *Frye* would address the underlying scientific theories which the computer helps to illustrate. They recognized that computers quickly produce results set up by preprogrammed ideas.⁴² Notice, however, that the *Starr* court would allow inquiry into principles of computer display. The question of whether technique or

29. See Chaney, *supra* note 14, at 744.

30. Reagan, *supra* note 24, at *2.

31. *Id.*

32. *Id.*

33. 591 N.E.2d 165 (Mass. 1992).

34. *Id.* at 168-69.

35. *Id.* at 169.

36. *Id.*

37. 360 N.E.2d 1062 (Mass. 1977).

38. 655 P.2d 794 (Ariz. 1982).

39. Chaney, *supra* note 14, at 745. It is important for the reader to notice that the Arizona Supreme Court, in *Starr*, turned to the *Frye* test in evaluating computer simulations. This characterization of the computer simulation as "science" should be kept in mind during the discussion of *Bledsoe*, *infra* part III.C.

40. *Schaeffer*, 360 N.E.2d at 1067.

41. *Starr*, 655 P.2d at 797.

42. This idea of "underlying thought" will surface later in this Note. See *infra* notes 114-16 and accompanying text.

principle or both must pass *Frye* is unanswered.⁴³ It may also be a moot question for federal trial purposes since *Frye* has been overruled by *Daubert*. Still, there is no reason, at the state court level at least, for abandoning the common law principle in force since 1923.

2. Computer Displays Under the FRE and *Daubert*

Frye's life as federal precedent died in the case of *Daubert v. Merrell Dow Pharmaceutical*.⁴⁴ *Daubert* was decided in light of the passage of the FRE, and the question presented to the Court was whether the *Frye* standard of "general acceptance" had survived the Rules' enactment. Interpreting the rules of evidence "as [they] would any statute," the Supreme Court found that *Frye* had been overruled by the FRE, stating:

Given the Rules' permissive backdrop and their inclusion of a specific rule on expert testimony that does not mention "general acceptance," the assertion that the Rules somehow assimilated *Frye* is unconvincing. *Frye* made "general acceptance" the exclusive test for admitting expert scientific testimony. That austere standard, absent from and incompatible with the Federal Rules of Evidence, should not be applied in federal trials.⁴⁵

The specific rule mentioned by the court is Rule 702, which provides that "[i]f scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise."⁴⁶ Note, however, that the Rule does not define what "scientific" is. As the Court readily admitted, the fact that the Rules overrule *Frye* does not mean that "the Rules themselves place no limits on the admissibility of purportedly scientific evidence."⁴⁷ The question, therefore, is what qualifies as admissible scientific evidence?

In *Daubert*, the Court, mindful that guidelines were needed, set forth some idea of what may matter in the determination of what constitutes "scientific evidence." The Court determined that in order to satisfy the FRE, the trial judge needs to determine two things: (1) whether the proposed testimony is based on "scientific knowledge," and (2) whether it would help the trier of fact understand or determine a fact at issue.⁴⁸ The Court grounded its definition of "scientific" primarily in methodology: if something had endured the scientific method, then it could generally be classified as "science."⁴⁹ Therefore, aspects of the method such as repeated testing, peer review, and publication may be important factors in the trial judge's findings.⁵⁰ In addition, "general acceptance" struggles back from the dead in the Court's decision; only now, instead of being determinative, "widespread acceptance can be an important factor."⁵¹ Just how important this revived factor is, the Court does not say. In fact, the Court classifies this entire

43. See Chaney, *supra* note 14, at 747.

44. 113 S. Ct. 2786 (1993).

45. *Id.* at 2794.

46. FED. R. EVID. 702.

47. *Daubert*, 113 S. Ct. at 2795.

48. *Id.* at 2796. The second prong of both the Court's and Rule 702's test is basically a repetition of the basic requirement of the FRE that evidence be "relevant." See FED. R. EVID. 401.

49. *Daubert*, 113 S. Ct. at 2796.

50. *Id.* at 2797.

51. *Id.*

doctrine not as a "definitive checklist" but as "some general observations."⁵² No cases have since applied these "general observations" to a computer display.

Whether *Daubert* is an any more open, "better," or different standard than *Frye*, is a subject sure to be the topic of law journal articles for years to come. For present purposes, however, it is enough to note that the prior methods of proof for validity under *Frye*—expert testimony, scientific writings, and judicial precedent—will be just as necessary as ever under *Daubert*, if not more so.

B. The Computer as the Witness

An alternative to treating computer displays as "scientific evidence" is to treat them as "demonstrative evidence." "Demonstrative evidence" has been defined as evidence that presents itself directly to the trier of fact.⁵³ Under the FRE, this means that a computer display must be relevant to a material issue, and its probative value—which in the case of computer displays is generally the conversion of a complex issue to visual evidence—must outweigh any prejudicial effect.⁵⁴ It is only when the computer display is presented as, or determined to be, "scientific" that Rule 702 and *Daubert* become involved.⁵⁵

A recent case that applies this kind of standard is *Strock v. Southern Farm Bureau Casualty Insurance Co.*⁵⁶ This case involved using a computer display of hurricane damage to a house for purposes of determining whether wind or flood was primarily responsible for the damage. The computer display was an engineering drawing that a computer programmer had animated.⁵⁷ The court held that it was in the discretion of the trial judge to "consider the relevancy of offered evidence and to weigh its probative value against its potential prejudicial effect."⁵⁸

Common law standards for demonstrative evidence are similar to the standards found in the FRE, but they are not identical. *New York v. McHugh*,⁵⁹ one of the few cases that directly addresses the issue of visual computer displays, succinctly sets forth the standard required: "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."⁶⁰ *McHugh* found a computer display admissible on the theory that it was more like demonstrative evidence than scientific evidence.⁶¹ "No extended pre-trial [*Frye*] hearing . . . is required. . . . The evidence sought to be introduced here is more akin to a chart or diagram than a scientific device. Whether a diagram is hand drawn or mechanically drawn by means of a computer is of no

52. *Id.* at 2796.

53. JOHN W. STRONG ET AL., MCCORMICK ON EVIDENCE § 212 (4th ed. 1984). This is a somewhat misleading definition, however, because under the Federal Rules "demonstrative evidence" can be either evidence that illustrates a witness' testimony, FED. R. EVID. 901(b)(1), or a "silent witness" that recorded some event using a reliable process, *id.* 901(b)(9).

54. *See id.* 401-403.

55. *See supra* text accompanying notes 46-49.

56. No. 92-2357, 1993 WL 279069 (4th Cir. July 12, 1993).

57. *Id.* at *2 n.1.

58. *Id.* at *1 (citing *Reed v. Tiffin Motor Homes, Inc.*, 697 F.2d 1192, 1199 (4th Cir. 1982)).

59. 476 N.Y.S.2d 721 (N.Y. Sup. Ct. 1984).

60. *Id.* at 723.

61. *Id.* at 722; Chaney, *supra* note 14, at 742.

importance."⁶² The court, therefore, applied the basic admissibility standard that requires demonstrative evidence to be both illustrative and explanatory of a relevant issue.⁶³

This does not mean, however, that the party using the computer display does not have to "lay the proper groundwork and qualify the expert"—in other words, the party cannot avoid foundational requirements.⁶⁴ It is generally within the discretion of the trial judge to decide what constitutes an adequate foundation, absent any statutory requirements.⁶⁵ In general, however, an attorney has usually laid a foundation if she informs the judge of the existing safeguards against error and of the methodology of the computer display.⁶⁶ However, whether a witness must supplement and identify the computer display is not clear. *McHugh* seems to apply the traditional theory of demonstrative evidence which is the "illustration" theory: illustrative evidence must accompany and accurately depict witness testimony.⁶⁷ While there is a new theory of the "silent witness" of recording devices in many jurisdictions,⁶⁸ it is doubtful that a computer display falls into this common law category.⁶⁹ The provision in the FRE for silent witnesses may offer a bit more hope, since it defines this category as "[e]vidence describing a process or system used to produce a result and showing that the process or system produces an accurate result."⁷⁰ A computer display may be found to fit this definition. ~

In general, the standards for demonstrative evidence are less strict than those for scientific evidence, even though the standards for scientific evidence have changed under *Daubert*. However, the lawyer still must satisfy foundational requirements under all the standards if she attempts to admit the computer display into evidence, no matter what kind of evidence the courts determine computer displays to be.

II. THE INHERENT DIFFICULTIES OF GETTING COMPUTER DISPLAYS INTO EVIDENCE

Having examined the way the current law attempts to deal with computer displays in the courtroom, this Note now turns to the potential problems that could plague a lawyer attempting to admit a computer display into evidence. The types of problems that may arise in this area can be frustrating and disappointing, both for the lawyer who has taken the time to prepare a sophisticated computer display and for the client who has paid for it. These possible problems break down roughly into three general groups: (1) foundational deficiencies for demonstrative evidence; (2) additional deficiencies that may arise under the scientific evidence standards; and (3) hearsay objections.

62. *McHugh*, 476 N.Y.S.2d at 722.

63. Chaney, *supra* note 14, at 742.

64. *McHugh*, 476 N.Y.S.2d at 722.

65. Chaney, *supra* note 14, at 742.

66. *See id.* at 743.

67. *See* STRONG ET AL., *supra* note 53, § 212, at 667; J. ALEXANDER TANFORD, *THE TRIAL PROCESS: LAW, TACTICS AND ETHICS* 206 (2d ed. 1993).

68. TANFORD, *supra* note 67, at 207-08.

69. The exact problems involved in foundational requirements under all standards will be discussed *infra* part II.A.

70. FED. R. EVID. 901(b)(9).

A. Foundational Problems in Demonstrative Evidence

Before a court allows any exhibit into evidence, under either the FRE or state procedures, it must first be authenticated.⁷¹ According to the FRE, “[t]he requirement of authentication or identification as a condition precedent to admissibility is satisfied by evidence sufficient to support a finding that the matter in question is what its proponent claims.”⁷² Authentication can be accomplished by knowledgeable witness testimony,⁷³ or, perhaps more promisingly for *true* computer simulations, by evidence of “process or system.”⁷⁴

No court has yet set an authentication standard for the admissibility of computer displays.⁷⁵ However, some indication of what constitutes good authentication may be derived from the authentication requirements for computer business records.⁷⁶ *United States v. Russo*⁷⁷ provides an example. The case involved the admission into evidence of a statistical record.⁷⁸ Because of the testimony of two employees concerning their familiarity with the machine and an extensive detailing of the input control mechanisms involved, the court upheld the admission.⁷⁹ The court expressed concern that the accuracy of the overall process was the key factor in admitting such computer records.⁸⁰ Remember, too, *New York v. McHugh*'s caution that even in demonstrative evidence, the “expert witness” must be qualified.⁸¹ Therefore, the attorney who does not, or cannot,⁸² spend enough time clarifying for the court the intricate details of the computer display at issue risks losing her chance of presentation.

From here, the problem becomes whether the computer display will be regarded as “illustrative evidence” of a witness’ testimony or whether it will be regarded as a “silent witness.” If the computer display does not actually represent the view of any one witness, but a composite view of multiple witnesses, then it will be difficult, at best, to get the computer display into evidence.⁸³ If the attorney tries to admit the computer display as a “silent witness,” she still may fail; the “silent witness” doctrine is intended primarily to allow into evidence “[p]hotographs or other Media that accurately recorded events at the time they occurred”⁸⁴ The computer display, on the other hand, is not really a recorder of events; it is more like a reconstructor.⁸⁵ So, even though the FRE talks in

71. See FED. R. EVID. 901(a); ERIC D. GREEN & CHARLES R. NESSON, PROBLEMS, CASES, AND MATERIALS ON EVIDENCE 940 (2d ed. 1994); STRONG ET AL., *supra* note 53, §§ 212, 214.

72. FED. R. EVID. 901(a).

73. *Id.* 901(b)(1).

74. *Id.* 901(b)(9).

75. Murphy, *supra* note 20, at 151.

76. Warton, *supra* note 15, at 740-41.

77. 480 F.2d 1228 (6th Cir. 1973), *cert. denied*, 414 U.S. 1157 (1974).

78. *Id.* at 1239.

79. *Id.*

80. See *id.*

81. 476 N.Y.S.2d at 722; see also *supra* text accompanying note 64.

82. Simulations prepared for trial are not like computer business records, where it is relatively simple to find someone in the business who is familiar with the machine.

83. See generally STRONG ET AL., *supra* note 53, § 213 (underscoring the idea that illustrative evidence must represent the view of one witness only); TANFORD, *supra* note 67, at 206-07.

84. TANFORD, *supra* note 67, at 208.

85. An excellent use of such a “reconstructor” may be to provide an illustration to the testimony of an accident or crime-scene reconstructionist. In *State v. Clark*, No. CR-285,552, 1995 WL 66675 (Ohio Ct. App. Feb. 16, 1995), the court allowed a crime-scene reconstructionist to use a computer and a three-dimensional drafting program called AutoCad to illustrate his judgment that a shooting could not have happened the way the defendant described. *Id.* at *20. However,

terms of "process or system," it requires that these systems be reliable in producing an "accurate result."⁸⁶ If the result in question is the accurate recording of an event, the litigator is out of luck. Even if the judge decides to broaden the category of "silent witnesses," the foundational requirement of showing process and accuracy brings back the problems encountered with authentication.

B. Obstacles Under Scientific Evidence

Now suppose that the judge decides that computer displays, or at least this particular one, qualify as scientific evidence, rather than demonstrative evidence. The attorney will now have to deal with either the *Frye* test or the FRE and *Daubert*.⁸⁷ Either test will impose heavy burdens on the lawyer attempting to get the computer display into evidence.

Under *Frye*, the lawyer will first have to determine exactly which scientific community she is addressing.⁸⁸ This may be no easy task, especially considering the peculiar characteristics of the computer. In some ways, computer operations are a scientific discipline unto themselves. In other ways, however, the computer is merely a tool or technique used by other scientific disciplines.

Which scientific community will the litigator pick? It could be that the fundamental principles of the particular computer display are well established in a field, but their application in a court of law by a computer is not "generally accepted."⁸⁹ A computer scientist may say that using a computer display in a particular way is perfectly acceptable; an expert from another related discipline may feel that this application is suspect. In any event, a *Frye* test adds one more hearing to a long trial and one more witness expense to an already costly bill.

The outlook is not much better under the FRE and *Daubert*. The lawyer will still be required to show that the computer display is "scientific knowledge," based in scientific methodology. One cannot simply say that if something is related to a computer it must be scientific; after all, astrological signs or biorhythms could be charted with a computer. Once again, expert witnesses, and the associated costs, come on stage to debate whether the computer display is "scientific."⁹⁰ These ramifications undermine the idea that the computer display will simplify and streamline the attorney's case.

C. Hearsay Objections

The last category of obstacles that a trial attorney may face is hearsay objections. A computer display may be regarded by the judge as "a statement, other than one made by

he also testified that part of his reconstruction had been done with the program. *Id.* at *3. Notice that the panel could have decided on this basis that the AutoCad was therefore a "scientific method." *See id.* at *18-19.

86. FED. R. EVID. 901(b)(9).

87. *See supra* notes 20-21 and accompanying text.

88. *See supra* notes 26-28 and accompanying text.

89. Or it could be that the judge is incorrect and the simulation is not really "scientific evidence" at all. This particular problem will be addressed further *infra* part III.A.

90. *See supra* text accompanying notes 48-52. A court following the *Daubert* standard may be just as likely to be hostile to computer displays. In *Exxon Corp. v. Halcon Shipping Co.*, No. 91-920, 1995 WL 20667 (D.N.J. Jan. 18, 1995), the court described a computer display as "junk science," and criticized the fact that the display had been modified four times. *Id.* at *23-24. However, this appears to be a situation where the display was intended to show the party's theory of the case; if so, the decision to evaluate it under *Daubert* was incorrect from the beginning.

the declarant while testifying at the trial or hearing, offered in evidence to prove the truth of the matter asserted";⁹¹ it would therefore be an out-of-court statement and subject to hearsay objections.⁹² An attorney attempting to get this computer display into evidence should anticipate a hearsay objection.⁹³ Computer displays do not fall within an exception to hearsay. The displays are prepared especially for trial, and not made in the course of business; the business records exception therefore does not apply.⁹⁴

Ways of getting around this particular problem have been suggested. One possible reply, in an FRE-type system, is to present the computer display as demonstrative evidence not offered to prove the truth of an asserted matter but offered to illustrate witness testimony.⁹⁵ This approach may work as long as the computer display represents a witness' testimony; if, however, it is not illustrative or demonstrative evidence, then this reply will probably fail.

If the computer display is presented as scientific evidence, then the FRE would allow it to be the basis for expert testimony even though it is hearsay.⁹⁶ However, the facts or data that underlie an expert opinion must be "of a type reasonably relied upon by experts in the particular field."⁹⁷ This standard may cause problems similar to the foundational problems for scientific evidence.⁹⁸ The interdisciplinary nature of computer use blurs the questions of which particular field counts and what "reasonably relied upon" means. This standard also frustrates the original goal of having the trier of fact view the computer display firsthand.

The final attempt to refute a hearsay objection is to portray the computer as a modern type of hypothetical question.⁹⁹ A hypothetical question is defined as "a form of question framed in such a manner as to call for an opinion from an expert based on a series of assumptions claimed to have been established as fact . . . in a case" that "either the court or the questioner may decide . . . should be used."¹⁰⁰ Hypothetical questions are generally used when an expert lacks sufficient knowledge of the facts of the case.¹⁰¹ Since that data involved in the formulation of a computer display will generally be known or observed, the data may qualify as evidence of the record or as a reasonable inference from the record.¹⁰² The computer can therefore be pictured as giving an "opinion" on a hypothetical question.

The problem with this argument, however, is that the computer will have to be established as an expert. Putting aside judicial skepticism, the opposing party should be able to raise enough issues of quality control and accuracy to diminish severely the

91. FED. R. EVID. 801(c). This is likely to be the definition in jurisdictions which have adopted provisions of the FRE. Not all jurisdictions have enacted FRE-type provisions, however. See Chaney, *supra* note 14, at 756.

An excellent example of an objection to a computer display as hearsay can be found in *United States v. Trenkler*, 61 F.3d 45 (1st Cir. 1995). This case dealt with a computer program that collects data on bombing incidents, and could be used to match bombs with similar characteristics. The court found that this was hearsay, since the defendant could not question the witnesses who originally observed the bombings. *Id.* at 58-59.

92. See FED. R. EVID. 801(c).

93. Chaney, *supra* note 14, at 756.

94. See FED. R. EVID. 803(6).

95. Chaney, *supra* note 14, at 756.

96. See FED. R. EVID. 703.

97. *Id.*

98. See *supra* text accompanying notes 87-90.

99. Chaney, *supra* note 14, at 757.

100. BLACK'S LAW DICTIONARY 743 (6th ed. 1990); see also STRONG ET AL., *supra* note 53, § 14 (offering a good general summary of hypothetical questions).

101. STRONG ET AL., *supra* note 53, § 14; TANFORD, *supra* note 67, at 353.

102. Chaney, *supra* note 14, at 758.

evidentiary value of the computer display. Additionally, the hypothetical question approach will not work if the program in question does not really generate a scientific opinion, but instead illustrates some theory of the case.

The litigator who attempts to use computer-generated graphical evidence in a courtroom faces serious obstacles in both foundational and hearsay requirements. The picture that comes to mind is the old "square peg into a round hole"; as the lawyer tries to push his computer display into a system that is ill-suited to accept it. Barring specific rules on the use of computers at trial, which may be proposed as the number of cases using this technology increases, is there any easier way that the lawyer can use this technology at trial? For that matter, when rules and standards are eventually implemented, is there a logically coherent way of thinking about computers that will provide a better framework in dealing with these technologies?

III. A NEW WAY OF THINKING: COMPUTER DISPLAYS AS ARGUMENT IN SUMMATION

Imagine this situation: a solo practice attorney receives a tort case, such as an auto accident. The attorney goes out, collects the evidence, and develops a theory of the case. In her office, for her own benefit, she diagrams what she believes happened according to the evidence. Looking at the drawings on paper, she remembers the three-dimensional drawing and animation program that was included with her latest office computer—or thinks of an inexpensive company that offers this kind of animation. She thinks: "These drawings help me understand my case better; wouldn't the jury also better understand my case if they could see them? In fact, if these drawings were three-dimensional and animated, they could *really* see the point of my case."

So, she spends anywhere from a day to a week learning the program or sends it off to the appropriate business. Either way, she soon has an excellent visual display that combines all the key points of her case into a visually coherent whole. "Wait," she now thinks. "How am I going to use this at trial?" The immediate answer that springs to mind is "get it into evidence." However, the display does not really illustrate any one witness' perception; it instead incorporates the witness' perception into her theory of the case and also includes forensic evidence. It is, therefore, not traditional demonstrative evidence.¹⁰³ Nor is it a "silent witness," since the events, places, and people involved are being reconstructed rather than recorded.¹⁰⁴

In addition, the display incorporates some evidence she obtains from some scientific experts—accident reconstruction technicians, for example. Doesn't she have to worry about scientific evidence foundations? Maybe her jurisdiction requires "general acceptance" which adds another pre-trial hearing to the case.¹⁰⁵ Or, maybe her jurisdiction has moved towards the *Daubert* standard. While she could easily show that the evidence from the reconstruction experts came from "scientific methodology"¹⁰⁶ and that she plans to call the experts as witnesses, the lawyer is unsure whether she can show that her own application of the evidence in the display is similarly scientific. If she programmed it herself then no expert witness is available, unless the original writer of the drawing and

103. See *supra* note 83 and accompanying text.

104. See *supra* text accompanying note 84.

105. See *supra* text accompanying note 89.

106. See *supra* notes 48-49 and accompanying text.

animation program could be brought to testify in the case. Even if this were possible, the expert would know nothing about the specific application of his program to her case. Even if she had not done it herself, the programmer who had performed the job likewise would be unable to supply much information about the specific computer program; after all, the animator only followed the attorney's instructions.

The attorney also realizes that the whole thing may be shot down by a hearsay objection anyway. This display does not fit any exception. She could not argue that it is merely illustrative evidence because it is offered to prove the truth of the matter asserted.¹⁰⁷ The display demonstrates the plausibility of her theory of the case. It also is not the basis for any expert's testimony, nor is it a hypothetical question being proffered to an expert;¹⁰⁸ the computer is not giving an opinion, but rather being told to display certain objects in certain ways.¹⁰⁹

In retrospect, the attorney feels that she has wasted her time. This scenario does not necessarily have to occur, however. There *is* a way that such an animation can be used at trial: namely, in the closing argument. The traditional law that governs summations is broad enough to allow computer displays of this type; what should change, however, is the way both lawyers and judges think about computers. Both need to realize that computer displays are not just *evidence*, but *argument*. In other words, the computer can be used as a pedagogical device.

A. The Confusion About Computers

At the heart of the problems with computers and computer displays is that lawyers and judges are not sure what they are. It is surely a fallacy to call them "calculators with a giant 'memory,'"¹¹⁰ but neither are they something incredibly complex and incomprehensible like the HAL 9000 and others of science fiction fame.

The answer to what constitutes a computer begins with a simple definition. The dictionary definition of a computer is a "programmable electronic device."¹¹¹ The key word here is "programmable"; a computer is capable of storing and later executing the instruction given. This separates a computer from an ordinary calculator. The language of programming uses logical sequence and mathematics to give the computer instructions in a way that the computer understands.

Thus, a computer is capable of doing many different things. Today computers are applied in a myriad of ways: from programmable CD players to video-game systems, all these applications have at root the capacity to store and follow instructions. This, as well as a rate of mathematical calculation higher than humans, makes computers unique.

Of course, the concept of following instructions means that someone must be giving instructions. This is where the "man behind the curtain" resides. The computer is only capable of doing exactly what a human being tells it to do, a principle known by its acronym, "GIGO," which stands for "Garbage In, Garbage Out."¹¹² If the human places

107. See *supra* note 95 and accompanying text.

108. See *supra* notes 100-02 and accompanying text.

109. In *State v. Harvey*, 649 So. 2d 783 (La. Ct. App. 1995), the defendant objected to the prosecution's computer display as "cumulative." In other words, the exhibit went beyond the testimony of the one witness with whom it was introduced. *Harvey* is a good example of the concerns mentioned above.

110. *Perma Research & Dev. v. Singer Co.*, 542 F.2d 111, 124 (2d Cir. 1976).

111. MERRIAM-WEBSTER'S COLLEGIATE DICTIONARY 237 (10th ed. 1993).

112. Hoenig, *supra* note 11, at 33.

“garbage,” or faulty information, into a computer, then the computer’s output will be “garbage.”¹¹³ The point of the GIGO principle, which is the first lesson of any computer class, is that the computer cannot be anything more than what the programmer tells it to be. In other words, a computer program will not generate anything that does not have human “underlying thoughts.”¹¹⁴ In the “old days” of modern computer programming, circa 1970, there was usually only one programmer behind the software. These days, the larger computer applications involving subjects like word processing, accounting, and entertainment will have multiple programmers working on different parts of the program, tying them together at the end. Everything in the computer program, however, is traceable to a human being. This includes the *user* of the program. For example, this Note is being written on a computer, and what I am doing at this very moment is programming. If I select a certain option, I can see the code that I am placing into the computer at the bottom of the screen. The *original* programmers wrote a program that allows me to input my own programming instructions in a way that is convenient.

The key is to realize that computers can do different things. Some commentators have already recognized this, and have attempted to draw the distinction along the lines of “animation” and “simulation.” “A distinction must be made, however, between a raw ‘animation’ that can be used to support an expert’s opinion or illustrate a hypothesis and a verified *computer simulation* that is based upon the laws of physics and, therefore, is more than mere opinion.”¹¹⁵ The confusion of language that is indicated here is relevant, for the law has often not distinguished terms such as “animation” and “simulation.” The first part of this theory needs to identify exactly what kind of computer program is at issue. For purposes of this Note, I am discussing “computer-generated displays,” in other words, the result of a computer process that can be shown in some form to the trier of fact.

However, further subdivisions and the appropriate levels of treatment should not follow the distinction between “animation” and “simulation,” but instead follow from determining the identity of the “initial relevant knowledge” behind the computer display. The judge and lawyer both need to spot the “man behind the curtain.” If the computer displays the results of a scientific method or process that has been programmed into it by an expert, then it can be regarded as giving “scientific evidence,” and be subject to the appropriate scientific foundations.¹¹⁶ If the computer displays what is essentially an eyewitness’ account of an event, then it can be regarded as “illustrative evidence,” and be subject to the demonstrative evidence foundations.¹¹⁷ If, however, the computer displays a lawyer’s theory of the case, and is constructed with evidence that has been admitted in the record (which can be either scientific or illustrative), then the display resembles *argument* by the attorney. In this situation, the computer functions as a pedagogical device, and should be used in an attorney’s closing argument and evaluated using the laws governing summation.

The “initial relevant knowledge” will not necessarily belong to the person who constructed the display. In the case of illustrative evidence, the witness has probably not

113. *Id.*

114. Some early programmers, such as my father, Professor Mario Borelli of the Mathematics Department at the University of Notre Dame, are well aware of this principle. My father, if it is practical, still prefers to write a program himself when he wants a computer to do something for him in order to know exactly what is going into it.

115. Hoenig, *supra* note 11, at 33 (emphasis added); see also Reagan, *supra* note 24, at *1.

116. See *supra* part I.A.

117. See *supra* part I.B.

programmed his version of events into the computer personally; however, it is the witness' knowledge which is relevant to the case at hand, and which is displayed by the computer. The fact that there will be intervening persons programming the "initial relevant knowledge" should not distract judges and lawyers. What should matter, for the purpose of identifying what kind of display exists (scientific, illustrative, or argument), is who supplied the information that is to be displayed at trial; expert scientist, eyewitness, or attorney.

B. Computers as Pedagogical Devices

The above suggests that computers can be used as pedagogical devices in summation. It might be easier to think of this as illustrative evidence; that is, not the evidence of a witness, but an attorney.¹¹⁸ The rules that have traditionally governed closing arguments tend to support this view. Most jurisdictions permit use of diagrams, charts, and blackboards, even when they are not in evidence.¹¹⁹ "Closing argument is not limited to words. You are permitted to use all kinds of visual aids to help communicate your theory. You are not limited to the exhibits introduced during trial. New exhibits—usually charts or blackboard drawings—may be used if they are based on the evidence."¹²⁰ The rules are broad enough that the attorney may be able to use new, unauthenticated models or illustrative exhibits.¹²¹

Several court decisions describe the philosophy underlying this theory of closing argument. In *Clisby v. Mobile & O. R. Co.*,¹²² the Mississippi Supreme Court, holding that it was not error to allow counsel's use in summation of a diagram of a locomotive, although that diagram was not in evidence, stated:

[T]he presiding judge instructed the jury that it was not evidence, and refused to allow it to be carried into the jury room when they retired. The counsel using it disclaimed its being evidence. We cannot say this was error. A proper latitude must be granted counsel in arguing the cause under the oversight and in the sound discretion of the trial court. . . . This is a day of illustrations, in recognition of the fact that the eye may often be a better medium of enlightening the mind than the ear. Counsel, within the record, should be allowed the best lawful means of bringing the jury to a better understanding of the cause.¹²³

These words, written at the turn of the century, are particularly relevant to the issue of computer displays. The principle has since been stated in Mississippi to allow use of a chart itemizing damages in a burn case,¹²⁴ and the use of a chart summarizing standards of proof in a criminal case.¹²⁵ Similar standards have been utilized in allowing the use of

118. See Reagan, *supra* note 24, at *4, for the definition of "demonstrative evidence," evidence "aiding the lawyer, either in opening or closing argument." This Note has suggested that the proper place for such displays is the summation. This is because opening statements are limited to the facts the advocate intends to prove, that is, get into evidence. The opening statement is not the time for argument. TANFORD, *supra* note 67, at 143.

119. 88 C.J.S. *Trial* § 177 (1955). *But see* Allen v. Lewis, 469 S.W.2d 489, 491 (stating that "[d]ocuments never introduced during trial cannot be used by an attorney in his argument").

120. TANFORD, *supra* note 67, at 383.

121. *Id.* at 384.

122. 29 So. 913 (Miss. 1901).

123. *Id.* at 914.

124. 4-County Elec. Power Ass'n v. Clardy, 73 So. 2d 144 (Miss. 1954).

125. Heidelberg v. State, 584 So. 2d 393 (Miss. 1991).

a freehand diagram of writing samples,¹²⁶ and a model of scaffolding in a wrongful death case.¹²⁷

This is not to say, however, that counsel could plug in anything she wants the jury to see into a computer display. If one treats the display as an extension of the attorney's argument, then it should be subject to the same guidelines that govern what an attorney may say. "Proper argument is supposed to be confined to facts introduced in evidence, facts of common knowledge, and logical inferences based on the evidence."¹²⁸ Similarly, an attorney cannot argue about facts not in the record, misstate testimony, or attribute to a witness testimony not actually given.¹²⁹ If the lawyer discloses the display to the opposing counsel and the judge beforehand, which is the recommended procedure anyway,¹³⁰ then its basis in the evidence can be verified and the program altered, if need be. If an attorney using a computer display abides by these ground rules, then it should be allowed as a pedagogical device.

A lawyer may wonder, however, whether something is lost by not getting the display into evidence. While it is true that the judge's admonition that the display is not evidence does not give it the weight of record, the principal value of the display is not lost. As one trial animator describes it, "[w]hen an oral presentation is given, everyone might perceive that differently . . . [w]hen you present them with an animation or visualization, people will understand clearly what you are trying to explain."¹³¹ Not only will they understand, but they will remember. When information is presented visually, 87% of it is retained; if it is only perceived through audio, then a mere 10% is retained.¹³² When the display is presented in summation, the advantage of graphic representation is still available to the jurors even though the display did not come into evidence.

C. *The Error of Bledsoe v. Salt River Valley Water Users' Ass'n*

Not surprisingly, considering the boom in the use of computer graphics, lawyers out in the trenches have already sought ways to use their computer displays without having to go through the quagmire of evidentiary rules. One such lawyer was involved in an Arizona case, *Bledsoe v. Salt River Valley Water Users' Ass'n*.¹³³

The case involved a tort action in which a bicyclist hit a cable gate on the association's property. The plaintiff was riding his bicycle to work on an unfamiliar route one morning before sunrise, and his bicycle was not equipped with a headlight.¹³⁴ He struck the gate and was rendered a quadriplegic.¹³⁵

Bledsoe's counsel attempted to use what the court called a "videotaped computer simulation" ("VCS").¹³⁶ Opposing counsel objected in limine, arguing that the VCS would be unsupported by the evidence and that Bledsoe's attorney would not present as

126. *Hagan v. Carr*, 48 A. 688 (Pa. 1901).

127. *Geist v. Rapp*, 55 A. 1063 (Pa. 1903).

128. J. Alexander Tanford, *An Introduction to Trial Law*, MO. L. REV. 624, 688 (1986).

129. *Id.* at 688.

130. See David Siegel & Brian Pass, *High Technology at Trial: Use It or Lose It*, in LITIGATION, at 605 (PLI Litig. & Admin. Practice Course Handbook Series No. 444, 1992).

131. Borzo & Damore, *supra* note 7, at 33.

132. Robert F. Seltzer, *A Strategic Approach to Demonstrative Exhibits*, in LITIGATION, at 379 (PLI Litig. & Admin. Practice Course Handbook Series No. 387, 1990).

133. 880 P.2d 689 (Ariz. Ct. App. 1994).

134. *Id.* at 690.

135. *Id.*

136. *Id.* at 691.

a witness the computer expert who prepared the program.¹³⁷ Plaintiff's attorney responded that expert testimony was unnecessary because the display would not be offered into evidence, but would be used for demonstrative purposes in the closing argument to show "counsel's 'version of what happened.'" ¹³⁸ The trial judge viewed the VCS and decided to wait and see if the evidence would indeed support the display.¹³⁹ After the evidentiary phase was finished, the trial judge ruled:

[A]s to everything that is depicted in the video tape, [Bledsoe's counsel] could get up and draw it and this is just a more sophisticated way of presenting his theory as to how the accident happened.

The fact that there's no foundation as [to] how it was prepared is completely immaterial.¹⁴⁰

The appellate court disagreed.¹⁴¹ The court first recognized the validity of charts and diagrams as pedagogical devices in closing arguments, especially in complex cases.¹⁴² However, the court went on to rule that:

· Having viewed the VCS ourselves, we conclude that it is not a pedagogical device. The VCS depicts a *computer expert's opinion* of, among other things, how the accident happened, the location of lighted and darkened areas at the time, and the effect of alternate or additional lighting. Bledsoe was thus required to lay the appropriate foundation for those opinions, and [the defense] was entitled to cross-examine the expert about them.¹⁴³

In addition, the court also stated that "[a]t a minimum, the proponent must show that 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 cross-examination."¹⁴⁴ It also indicated that in some instances, the attorney may have to show that the program is "generally accepted by the appropriate community of scientists."¹⁴⁵

The appellate court, however, erred in its reasoning. It confused the way of thinking about computers, and failed to recognize who provided the "initial relevant knowledge." In this case, the attorney's theory of the case provided this knowledge. After seeing the videotape and knowing that someone else prepared it, the court misplaced its focus after spotting the "computer expert" hiding in the background. Taking the expert out and imagining the *attorney* as the one who made the computer display, either with a commercial program or (less likely but not impossible) programmed from scratch, reveals the fallacy in this reasoning.

In this situation, just who is the "expert" that is going to be called and cross-examined? What the court saw as an "expert's opinion,"— and the court agreed with the trial judge on this point—was based on evidence already in the record, but was actually the lawyer's theory of the case. The name for an attorney's "expert opinion" of the facts is called argument. Argument is something which lawyers have broad range to do during

137. *Id.*

138. *Id.* at 691-92. This should be starting to sound familiar to the reader.

139. *See id.* at 692.

140. *Id.* (alterations in original).

141. *Id.*

142. *Id.*

143. *Id.* (emphasis added).

144. *Id.*

145. *Id.* Remember that Arizona previously required a *Frye* hearing for computer evidence. *See supra* notes 38-43 and accompanying text.

summation. All the "computer expert" did was construct a display from the attorney's information on the case. As the trial judge aptly perceived, this is the only relevant information to the case. The court, however, was blinded by science. The court mistakenly assumed that the jury could not adequately understand the VCS without the testimony of the programming "wizard" who conjured it. The court incorrectly identified the human behind the computer.

There is a policy reason against the court's decision as well. There are already concerns that the move to computer graphics will leave poorer clients at a disadvantage.¹⁴⁶ If the courts are to add the costs of extra hearings and witnesses to the costs of using these graphics, then a problem that cheaper hardware and software was beginning to solve is exacerbated to unbearable levels; after all, new technology tends to move downward in price, but the costs of court time never go down.

D. The Real Objection: Prejudicial Effect

A legitimate concern offered against computer displays is that the computer will so influence the jury that it becomes prejudicial. As the defense lawyer in a criminal appeal notes, "the very word 'computer' carries a public image of infinitesimal precision."¹⁴⁷ The fear is that the highly communicative nature of computer graphics and the myth of the infallible computer will take the decision out of the jury's hands. The old adage "seeing is believing" may gain extra force in this setting.

This is a legitimate fear, as a computer can be used to show something that is not in the record, or be programmed to present varied degrees of realism (*e.g.*, digitizing live actors and using them in a reconstruction). However, the trial judge's firm hand would avoid many of these problems. The trial judge has almost unlimited discretion, especially in summation, to determine whether the computer display is based on the evidence, and to disallow displays that might be so "realistic" or emotion provoking as to unfairly prejudice one side.

In addition, one should hesitate before assuming that jurors will be easily "duped." Ironically, it is the dissenting judge in *Perma Research & Development v. Singer Co.* who gave a voice to the idea that jurors should view computers more skeptically: "As one of the many who have received computerized bills and dunning letters for accounts long since paid, I am not prepared to accept the product of a computer as the equivalent of Holy Writ."¹⁴⁸ It is not improbable to suggest that, especially with the modern proliferation of home computers, most people have had experience with the infamous "computer error."

Using computer displays in closing arguments also takes the displays out of evidence. Therefore, while the computer image may still be used to persuade the jury, it does not receive the full weight of evidentiary consideration. This is important because, in general, jurors base decisions "primarily on the evidence and not on extraneous factors."¹⁴⁹ Jurors are also not easily tricked or persuaded by tactics or clever rhetoric.¹⁵⁰ They may therefore be perfectly capable of giving proper weight to a computer display in

146. See Pinsky, *supra* note 1, at A1.

147. *Id.*

148. 542 F.2d 111, 121 (1976) (Van Graafeiland, J., dissenting).

149. TANFORD, *supra* note 67, at 14.

150. *Id.*

summation when the judge admonishes them that the display is not itself evidence. Certainly the lesson of the Rodney King trial, which used real footage and not virtual reality, is that seeing is not necessarily believing.

CONCLUSION

The computer has arrived in litigation. Cheaper and more sophisticated hardware and software are raising the use of computer-generated displays to ever higher levels. Computer displays have begun to appear in criminal trials, and the fantasy of a "virtual crime scene" may be reality sooner than one might imagine.

In contrast to the fast pace of computer use, the law of evidence is sluggishly responding to the challenges that computers present to the courts. This slow development results primarily from a deeply rooted sense of scientific mysticism in the legal profession about computers. This mysticism causes great confusion when addressing problems of computer use at trial.

However, once one realizes that computers are simply extensions of human operators, the law can develop coherently with regard to computers. The important question is who supplies the "initial relevant knowledge," and not who plugged it into the computer. This leads to a coherent analysis; it also leads to the possibility of using computers in summation, for if the "initial relevant knowledge" is an attorney's theory of the case, then the computer is really offered as argument, and not evidence. This is where the visual and clarifying properties of computer displays can really shine, without the necessity of trying to fit them in under the rules of evidence. As long as trial judges are mindful of treating the display as argument, and not allowing the displays to present images unsupported by the record, then the visual aspects can be presented and many of the prejudicial problems avoided.

There is a kind of beauty in the fact that a computer can be no better than the human being using it. Lawyers will still need to make good arguments, and cannot rely on a snazzy computer display to turn a flawed argument into a winning one. If you feed a garbage argument into a computer, the output, even if three-dimensional and in bright color, will still be garbage. This is a fact that should give heart to lawyers facing an opponent using a computer display.

The day may come when computers are developed that possess an artificial intelligence. When, if ever, that day comes, we all will need to reconsider our basic ideas about the computer. For now, realizing that the computer is an extension of the human mind in the way that other tools are extensions of the human hand is the first step toward getting rid of the confusion about computers and becoming comfortable with their presence in the courtroom.