

ANTONICK V. ELECTRONIC ARTS: EXPERT WITNESSES AND SOFTWARE COPYRIGHT INFRINGEMENT

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I. INTRODUCTION

In the information age, computer software is crucial to almost all sectors of the modern economy. For example, software has numerous applications in telecommunications, social media, finance, education, research, transportation, manufacturing, and healthcare. Ensuring that computer programmers will benefit from their work is crucial for the development of the software industry.

In the 1980s, there were extensive discussions on whether the patent system or the copyright system should be used to protect programmer interests.¹ These discussions resulted in general acceptance that copyright best protects software, while patent only protects a portion of computer programs.²

Software, especially source code, presents a unique challenge for copyright law because it is difficult for a layperson to understand. Literal or visual works are easily understood by a lay audience. In contrast, readers without extensive training in computer programming would find the source code of a commercial software impenetrable and overwhelming. When determining substantial similarity in a copyright infringement case, the role of the expert is crucial because it would be extremely difficult for the trier of fact to determine the structure and function of the program without an expert's aid. Therefore, even with access to the complete source code in question, the result of an infringement analysis could be arbitrary unless a court permits expert testimony.

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1. See Susan A. Dunn, *Defining the Scope of Copyright Protection for Computer Software*, 38 STAN. L. REV. 497 (1986); David W. Carstens, *Legal Protection of Computer Software: Patents, Copyrights, and Trade Secrets*, 20 J. CONTEMP. L. 13 (1994); John C. Philips, *Sui Generis Intellectual Property Protection for Computer Software*, 60 GEO. WASH. L. REV. 997 (1992); John M. Jr. Griem, *Against a Sui Generis System of Intellectual Property for Computer Software*, 22 HOFSTRA L. REV. 145 (1993); Andres G. Gonzalez, *The Software Patent Debate*, 1 J. INTELL. PROP. L. & PRAC. 196 (2006).

2. See, e.g., Carstens, *supra* note 1, at 29–37 (discussing Federal Circuit cases determining whether computer programs were patentable).

This Note argues that courts should allow expert witness testimony to aid fact finders determining whether computer programs in question are substantially similar. Part II explains some fundamental concepts of computer programming. Additionally, Part II introduces the current state of copyright law and the tests for substantial similarity. Part III discusses *Antonick v. Electronic Arts* and explains the role of expert witnesses in the Ninth Circuit's test for substantial similarity. Part IV examines how other circuits have approached the use of experts in software copyright infringement cases. From this case law, Part V argues that expert testimony should be admissible at every stage when determining substantial similarity of software works. Finally, Part VI concludes.

II. BACKGROUND

A. BASIC CONCEPTS OF COMPUTER HARDWARE AND SOFTWARE

A computer requires both hardware and software to function properly.³ Computer hardware refers to physical devices of a computer system, such as the central processing unit (CPU), memory, hard disk, electrical circuits, input devices, and output devices.⁴ Computer software refers to both operating systems and application programs, which programmers design to control the hardware.⁵ Computer programs include both source code and object code.⁶ Programmers usually write and edit source code because it is often written in a programming language.⁷ Programming languages are more similar to human languages than object code.⁸ Object code is usually a binary file, which is machine executable and is not similar to human language.⁹ Thus, programmers must convert (“compile”) source code into object code to allow computers to execute the code.¹⁰

Although source code is human readable in principle, it is challenging for people without training in computer programming to understand.¹¹ Moreover, commercial software source code could include millions of lines of code,

3. *Computer*, WIKIPEDIA, <https://en.wikipedia.org/wiki/Computer> [<https://perma.cc/8DRD-ULR9>] (last visited Feb. 18, 2019).

4. *See id.*

5. *See id.*

6. *Computer Program*, WIKIPEDIA, https://en.wikipedia.org/wiki/Computer_program [<https://perma.cc/FAS6-GMJ4>] (last visited Feb. 18, 2019).

7. *See id.*

8. *See id.*

9. *See id.*

10. *See id.*

11. *Definition of Source Code*, LAW INSIDER, <https://www.lawinsider.com/dictionary/source-code> [<https://perma.cc/Y8LB-3VY7>] (last visited Feb. 18, 2019).

which is virtually impossible for a reader to read in the timeframe of a litigation.¹² Even computer software experts do not read the complete source code for purposes of detecting infringement; they have developed specially designed computer programs to flag similar parts in different source codes.¹³ These programs make it feasible to compare millions of lines of source code produced by both parties within the litigation timeframe.¹⁴

B. INTRODUCTION TO CURRENT COPYRIGHT LAW

In 1980, Congress chose the copyright system as the primary vehicle to protect computer programmers' interests.¹⁵ The copyright statute defines "computer program" as "a set of statements or instructions to be used directly or indirectly in a computer to bring about a certain result."¹⁶

Under current copyright law, to prove copyright infringement, a copyright holder must prove "(1) ownership of a valid copyright, and (2) copying of constituent elements of the work that are original."¹⁷ To satisfy the second element, a copyright holder needs proof of both actual copying of the work and that such copying constitutes an "improper appropriation."¹⁸ Copyright holders can establish actual copying by direct evidence, such as witness testimony or surveillance videos. When direct evidence is not available, a copyright holder may use circumstantial evidence to prove actual copying.¹⁹ Circumstantial evidence must show that the defendant had access to the original work and that the original and allegedly infringing works are substantially similar.²⁰ Likewise, to prove improper appropriation, the plaintiff must show that the defendant's allegedly infringing work is substantially similar to the copyrightable expression in the original work.²¹

12. *Codebases*, INFORMATION IS BEAUTIFUL, <https://informationisbeautiful.net/visualizations/million-lines-of-code> [<https://perma.cc/7YGL-K232>] (last visited Feb. 18, 2019).

13. Lydia Pallas Loren & Andy Johnson-Laird, *Computer Software-Related Litigation: Discovery and the Overly-Protective Order*, 6 FED. CTS. L. REV. 75, 83–86 (2012).

14. *Id.* at 85–86.

15. See Act of Dec. 12, 1980, Pub. L. No. 96-517, § 10, 94 Stat. 3028 (codified as amended at 17 U.S.C. § 117 (2012)); see also *Apple Comput., Inc. v. Franklin Comput. Corp.*, 714 F.2d 1240, 1249 (3d Cir. 1983) (finding that a computer program is a literary work and protected under copyright).

16. 17 U.S.C. § 101.

17. *Feist Publ'ns, Inc. v. Rural Tel. Serv. Co.*, 499 U.S. 340, 361 (1991).

18. See *Arnstein v. Porter*, 154 F.2d 464, 468 (2d Cir. 1946).

19. See 4 NIMMER & NIMMER, NIMMER ON COPYRIGHT § 13.01 (Matthew Bender, Rev. Ed. 2017).

20. See *id.*

21. See *Nichols v. Universal Pictures*, 45 F.2d 119, 121 (2d Cir. 1930).

A plaintiff's case often hinges on proving substantial similarity.²² For one, even after establishing actual copying, the plaintiff still needs to prove improper appropriation, which depends on the substantial similarity of the original work and allegedly infringing work.²³ For two, unless the defendant wholesale copies the plaintiff's copyrighted work, a plaintiff's case often hinges on whether the plaintiff can provide evidence establishing substantial similarity between plaintiff's work and the alleging infringing work.²⁴

1. *The Role of Experts*

As the Federal Rules of Evidence Advisory Committee noted, “[a]n intelligent evaluation of facts is often difficult or impossible without the application of some scientific, technical, or other specialized knowledge.”²⁵ The role of the expert witness is to supply this knowledge and assist the trier of fact to better evaluate evidence proffered by both parties. Under rule 702, qualified experts 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.”²⁶

Copyright jurisprudence developed in the context of literal works, visual arts, music, and other areas comprehensible by lay observers.²⁷ Courts are often willing to trust the judgment of lay jurors because courts believe that lay observers can correctly find similarities among these traditionally copyrighted works.²⁸ In *Arnstein v. Porter*, the Second Circuit set forth the two-step framework comprising the determination of factual copying and whether such copying amounts to misappropriation.²⁹ The court explicitly excluded expert testimony when determining unlawful appropriation.³⁰ The court reasoned that for unlawful appropriation, “the test is the response of the ordinary lay hearer; accordingly, on that issue, dissection and expert testimony are irrelevant.”³¹

In these areas, courts are cautious about expert testimony for fear that

22. *Shaw v. Lindheim*, 919 F.2d 1353, 1361 (9th Cir. 1990) (“No amount of proof of access will suffice to show copying if there are no similarities.”).

23. *Arnstein*, 154 F.2d at 473 (“The question, therefore, is whether defendant took from plaintiff’s works so much of what is pleasing to the ears of lay listeners, who comprise the audience for whom such popular music is composed, that defendant wrongfully appropriated something which belongs to the plaintiff.”).

24. See 4 NIMMER & NIMMER, *supra* note 19, at § 13.03.

25. FED. R. EVID. 702, advisory committee notes.

26. FED. R. EVID. 702.

27. See *Dawson v. Hinshaw Music Inc.*, 905 F.2d 731, 733–35 (4th Cir. 1990).

28. See *id.* at 734.

29. See *Arnstein v. Porter*, 154 F.2d 464, 468–69 (2d Cir. 1946).

30. *Id.* at 468.

31. *Id.* (internal quotation marks omitted).

expert testimony may unfairly influence the jury.³² Experts may be biased because they are paid by parties. Some experts may only present facts and opinions favorable to the party that employs them or sneak legal conclusions into otherwise factual presentations.³³ The risk of undue influence may also be elevated when the jury views experts as intelligent and trustworthy.³⁴

Computer software cases are different from traditional copyright cases because of their complicated and technical subject matter. As the Second Circuit noted in *Computer Associates International, Inc. v. Altai*, “computer programs are likely to be somewhat impenetrable by lay observers—whether they be judges or juries—and, thus, seem to fall outside the category of works contemplated by those who engineered the *Arnstein* test.”³⁵ Because the various tests for determining substantial similarities were developed in “the context of artistic and literary, rather than utilitarian, works,” they assume that lay people can determine the similarity of expressions in the works at issue.³⁶ In artistic and literary cases, the jury can better perform its duty without the interference and bias of experts. However, in computer software cases where the jury cannot make the subjective comparison in the first place, allowing expert witness will help the jury performing its duty.³⁷

2. Existing Tests for Substantial Similarity

As discussed earlier, proving substantial similarity is often crucial in a copyright infringement case. Without an effective and predictable way to determine substantial similarity, copyright protection would be of little value to computer programmers. Unfortunately, courts do not apply a uniform test to determine substantial similarities.³⁸ There are three main tests for determining substantial similarities: the ordinary observer or intended audience test used by the Second Circuit; the extrinsic/intrinsic test developed by the

32. See, e.g., *Marx & Co. v. Diners' Club, Inc.*, 550 F.2d 505, 511 (2d Cir. 1977) (“With the growth of intricate securities litigation over the past forty years, we must be especially careful not to allow trials before juries to become battles of paid advocates posing as experts on the respective sides concerning matters of domestic law.”).

33. See Note, *Expert Legal Testimony*, 97 HARV. L. REV. 797, 808–09 (1984).

34. See *Rottlund Co. v. Pinnacle Corp.*, 435 F.3d 726, 733 (8th Cir. 2006) (“[E]xperts enjoy an aura of reliability and trustworthiness and it is probable that the disputed evidence persuaded the jury in this case . . .”).

35. *Comput. Assocs. Int'l, Inc. v. Altai, Inc.*, 982 F.2d 693, 712 (2d Cir. 1992).

36. *Comput. Assocs. Int'l, Inc. v. Altai, Inc.*, 775 F. Supp. 544, 558 (E.D.N.Y. 1991).

37. See *Altai*, 982 F.2d at 713 (“In making its finding on substantial similarity with respect to computer programs, we believe that the trier of fact need not be limited by the strictures of its own lay perspective.”).

38. Compare *Altai*, 982 F.2d at 706–12 (setting forth a three-step test for computer software cases), with *Antonick v. Elec. Arts, Inc.*, 841 F.3d 1062 (applying extrinsic/intrinsic test to computer software cases).

Ninth Circuit; and the abstraction, filtration, and comparison test. The Second Circuit and Ninth Circuit's tests are the most influential in this field.

a) The Ordinary Observer Test and Intended Audience Test

Arnstein was an early but influential case for determining non-literal copyright infringement. It was decided by the Second Circuit in 1946.³⁹ *Arnstein* set forth the ordinary observer test for substantial similarity, where expert testimony is not admissible when determining unlawful appropriation.⁴⁰

In *Arnstein*, composer Ira Arnstein alleged that another composer, Cole Porter, infringed his copyrights on several songs.⁴¹ Porter moved for summary judgment, claiming that he had never heard Arnstein's songs.⁴² The district court granted Porter's motion.⁴³ The Second Circuit reversed, holding that Arnstein's credibility as a witness was better left for a jury to decide.⁴⁴

As discussed earlier, *Arnstein* set forth a two-step test for non-literal copyright infringement.⁴⁵ In the copying step of the analysis, expert testimony about substantial similarity is allowed.⁴⁶ However, in the unlawful appropriation step of the test, the court made clear that "expert testimony are irrelevant."⁴⁷ Although the *Arnstein* court did not provide much explanation of unlawful appropriation, the test is understood to require substantial similarity in the two works' protected expression, indicating that the defendant improperly copied that expression from the plaintiff's work.⁴⁸ The Second Circuit explained that in the second step of the test, "[e]xpert testimony of musicians . . . will in no way be controlling on the issue of illicit copying, and should be utilized only to assist in determining the reactions of lay auditors."⁴⁹ The court reasoned that "the views of [musician experts] are caviar to the general—and plaintiff's and defendant's compositions are not caviar."⁵⁰

In *Dawson v. Hinshaw*, the Fourth Circuit pointed out that the ordinary observer test for non-literal infringement was flawed when the works at issue

39. *Arnstein v. Porter*, 154 F.2d 464, 464 (2d Cir. 1946).

40. *Id.* at 473. Although expert testimony is admissible when determining factual copying, the court made it clear that it is not admissible on the issue of unlawful appropriation.

41. *Arnstein v. Porter*, No. 29-754, 1945 WL 6897, at *1–2 (S.D.N.Y. July 27, 1945).

42. *Id.* at *2.

43. *Id.*

44. *Arnstein*, 154 F.2d at 467–69.

45. *Id.*

46. *Id.*

47. *Id.* at 468.

48. *Id.*; see also Pamela Samuelson, *A Fresh Look at Tests for Nonliteral Copyright Infringement*, 107 NW. U. L. REV. 1821, 1825 (2013).

49. *Arnstein*, 154 F.2d at 473.

50. *Id.*

are caviar to the general.⁵¹ In *Dawson*, the copyright holder of an arrangement of the spiritual “Ezekiel Saw De Wheel” sued composer Gilbert Martin and a music company alleging that their arrangement infringed his copyright.⁵² After a bench trial, the district court held for the defendant.⁵³

On appeal, the Fourth Circuit found the district court erred in applying an “ordinary lay observer test,” instead of an ordinary intended observer test.⁵⁴ The court noted that *Arnstein* appropriately applied the ordinary observer test because the composition at issue was popular and could be appreciated by lay observers.⁵⁵ The court reasoned that according to *Arnstein*’s logic, “where the intended audience is significantly more specialized than the pool of lay listeners, the reaction of the intended audience would be the relevant inquiry.”⁵⁶ Therefore, the court decided to adopt an intended observer test.⁵⁷ The court further explained that “an ordinary lay observer characterization of the test [is] only [permitted] where the lay public fairly represents the works’ intended audience.”⁵⁸ The intended audience in *Dawson* was not the lay listener, as it was in *Arnstein*, but rather the choral director purchasing sheet music.⁵⁹

b) The Extrinsic/Intrinsic Test

The extrinsic/intrinsic test incorporates ideas from earlier approaches. In *Sid & Marty Krofft Television Prods., Inc. v. McDonald’s Corp.*, the Ninth Circuit established this two-prong test for determining substantial similarity.⁶⁰ In this case, Krofft Productions sued McDonald’s for copyright infringement of the Pufnstuf programs, a children’s television series.⁶¹ It alleged that McDonald’s had copied expressive elements from its programs and used them in commercials.⁶²

The Ninth Circuit announced the two-prong extrinsic/intrinsic test.⁶³ The first prong determines whether there is substantial similarity in ideas.⁶⁴ The court called the first step “extrinsic” because “it depends not on the responses

51. See *Dawson v. Hinshaw Music Inc.*, 905 F.2d 731 (4th Cir. 1990).

52. See *id.* at 732.

53. See *id.*

54. See *id.* at 733.

55. See *id.*

56. *Id.* at 734.

57. See *id.*

58. *Id.*

59. See *id.* at 737–38.

60. 562 F.2d 1157 (9th Cir. 1977).

61. See *id.* at 1161–62.

62. See *id.*

63. See *id.*

64. See *id.* at 1164.

of the trier of fact, but on specific criteria which can be listed and analyzed.”⁶⁵ In this step, dissective analysis and expert testimony are permissible.⁶⁶ The second prong determines whether there is substantial similarity between the forms of expression.⁶⁷ This step, “intrinsic test,” is a subjective comparison that focuses on whether the ordinary, reasonable audience would find the works substantially similar in the total concept and feel of the works.⁶⁸ The court characterized the second step as “intrinsic” because “it does not depend on the type of external criteria and analysis which marks the extrinsic test.”⁶⁹ Expert testimony is not admissible under the “intrinsic” analysis step.⁷⁰

In *Krofft*, the jury found that there was substantial similarity between the Pufnstuf programs and the McDonald’s commercials.⁷¹ The Ninth Circuit noted that “the intrinsic test for expression is uniquely suited for determination by the trier of fact,” and the standard of review should be the “clearly erroneous” standard.⁷² The court subsequently found that the jury’s finding was not clearly erroneous.⁷³

c) The Abstraction, Filtration, and Comparison Test

In *Altai*, the Second Circuit announced the most influential substantial similarity test for computer programs.⁷⁴ The abstraction, filtration, and comparison (AFC) test comprises three steps.⁷⁵ First, courts must construct an abstraction hierarchy of the computer program.⁷⁶ Second, courts need to filter out various unprotectable elements, such as standard programming techniques, platform determined interfaces and routines, non-original modules, and other elements excluded by various copyright doctrines.⁷⁷ After filtration, courts compare the copyright protectable elements left in the original program with the corresponding elements in the allegedly infringing program.⁷⁸ This test differs from the extrinsic/intrinsic test because it allows expert testimony in all three steps.⁷⁹

65. *Id.*

66. *See id.*

67. *See id.*

68. *See id.*

69. *Id.*

70. *See Olson v. Nat’l Broad. Co.*, 855 F.2d 1446, 1448–49 (9th Cir. 1988) (stating that expert testimony is appropriate under the extrinsic test, but not under the intrinsic test).

71. *See Krofft*, 562 F.2d at 1162.

72. *Id.* at 1166.

73. *See id.* at 1167.

74. *Comput. Assocs. Int’l, Inc. v. Altai, Inc.*, 982 F.2d 693, 706–07 (2d Cir. 1992).

75. *See id.*

76. *See id.*

77. *See id.* at 707–10.

78. *See id.* at 710.

79. *See id.* at 712–14.

In *Altai*, Computer Associates sued Altai for copyright infringement of a subprogram of a job-scheduling program.⁸⁰ Altai incorporated parts of the subprogram into its own job-scheduling program.⁸¹ When Computer Associates discovered that Altai might have appropriated parts of its program, it sued for copyright infringement and trade secret misappropriation.⁸² The Second Circuit agreed with the district court's finding that most of the parameter lists and macros in question were "either in the public domain or dictated by the functional demands of the program."⁸³ Therefore, the court found that "the district court could reasonably conclude that they did not warrant a finding of infringement given their relative contribution to the overall program."⁸⁴

III. *ANTONICK V. ELECTRONIC ARTS*

In *Antonick v. Electronic Arts*, the Ninth Circuit confirmed the test and evidentiary standards for determining substantial similarity in computer program copyright infringement cases.⁸⁵ This case is influential because the Ninth Circuit covers the most significant region for computer program litigations. However, it is troubling that the Ninth Circuit applied the extrinsic/intrinsic test to this software copyright infringement case. Because courts must exclude expert testimony when determining the intrinsic prong, the test may promote arbitrariness in cases involving source code and result in unpredictable doctrine.

A. BACKGROUND AND FACTS

Robin Antonick developed the original John Madden Football game for the Apple II computer (Apple II Madden).⁸⁶ It was the first football video game mimicking NFL football games.⁸⁷ Antonick subsequently transplanted this game to IBM-compatible computers (IBM Madden).⁸⁸ In 1989, Antonick began to work for Electronic Arts (EA), a computer game company, to develop similar Madden Football games for the Nintendo and Sega Genesis platforms.⁸⁹ In August 1990, EA told Antonick to stop working on the Madden Football game, because they had hired Park Place Productions to

80. *See id.* at 698–700.

81. *See id.*

82. *See id.*

83. *Id.* at 714.

84. *Id.* at 714–15.

85. *Antonick v. Elec. Arts, Inc.*, 841 F.3d 1062 (9th Cir. 2016).

86. *See id.* at 1064.

87. *See id.*

88. *See id.*

89. *See id.*

create a version with “more of an arcade style.”⁹⁰ In November 1990, EA released its first version of Sega Madden.⁹¹ In late 1991 or early 1992, EA released Antonick’s last Madden game, an updated version of IBM Madden.⁹² From 1992 to 1996, EA released a new version of the Madden Football game for Sega and Nintendo platforms every year (“Sega Madden” and “Nintendo Madden,” respectively).⁹³

Under Antonick’s contract with EA, EA would pay royalties to Antonick for any “derivative work” of Apple II Madden, where “derivative work” was defined “within the meaning of the United States copyright law.”⁹⁴ However, EA did not pay any royalties to Antonick for Sega Madden or Nintendo Madden.⁹⁵ In 2011, Antonick sued EA seeking contract damages for unpaid royalties for Sega Madden and Nintendo Madden.⁹⁶ Antonick claimed that Park Place copied his code and that Sega Madden and Nintendo Madden were derivative works of Apple II Madden.⁹⁷ Antonick produced evidence that Park Place finished Sega Madden in an unreasonably short timeframe, particularly considering that Park Place was understaffed.⁹⁸ Antonick’s expert witness, Michael Barr, opined that Sega Madden was substantially similar to certain elements of Apple II Madden.⁹⁹ Specifically, Mr. Barr opined that both games had “similar formations, plays, play numberings, and player ratings; a similar, disproportionately wide field; a similar eight-point directional system; and similar variable names, including variables that misspelled scrimmage.”¹⁰⁰ However, the complete source code of neither Apple II Madden nor Sega Madden was introduced into evidence.¹⁰¹

The jury found that Sega Madden was a derivative work of Apple II Madden, but the district court granted judgment as a matter of law in favor of EA.¹⁰² The district court held that Antonick had not met his burden of proof that Sega Madden was a derivative work because Antonick did not introduce the source code of the two video games into evidence.¹⁰³

90. *See id.*

91. *See id.*

92. *See id.*

93. *See id.*

94. *See id.* at 1065.

95. *See id.*

96. *See id.*

97. *See id.*

98. *See id.*

99. *See id.*

100. *Id.* (internal quotation marks omitted).

101. *See id.*

102. *See id.*

103. *See id.*

B. SUMMARY OF DISTRICT COURT DECISION

To determine whether Sega Madden was a derivative work of Apple II Madden, the district court applied the extrinsic/intrinsic test.¹⁰⁴ Two questions were presented to the jury: (1) whether EA copied the expression of any protected element in any of the Sega Madden games at issue; and (2) if so, whether that copying made Sega Madden an infringing work of Apple II Madden.¹⁰⁵

The first question corresponds to the extrinsic prong of the test. The jury found that for each version of Sega Madden, Antonick proved that there were substantial similarities between the copyright protectable elements “plays and formations.”¹⁰⁶ The second question asked whether the copying of the source code that expressed “plays and formations” amounted to infringement.¹⁰⁷ The jury found that all versions of Sega Madden were virtually identical to Apple II Madden.¹⁰⁸ Therefore, the jury found that all versions of Sega Madden were derivative works of Apple II Madden and that EA owed royalties to Antonick.¹⁰⁹

The district court, however, granted judgment as a matter of law in favor of EA.¹¹⁰ The court noted that there was insufficient evidence to enable the jury to make a comparison of Apple II Madden and the different versions of Sega Madden because neither the source code of Apple II Madden or Sega Madden was introduced into evidence.¹¹¹ The court noted that without both games’ source code, the jury had no evidence from which to place the protected expression “in the context of Apple II Madden as a whole.”¹¹² In addition, the Court found Mr. Barr’s testimony and the visual presentation of the “plays and formations” of Apple II Madden and Sega Madden impermissible because the plays and formations were not copyright protectable.¹¹³ The Court explained that Antonick’s ownership was limited to the “expression of the plays and formations in his source code, not the plays

104. *See* Antonick v. Elec. Arts Inc., No. C 11-1543 CRB, 2014 WL 245018, at *5–6 (N.D. Cal. Jan. 22, 2014).

105. *See id.*

106. *Id.*

107. *Id.*

108. *See id.*

109. *See id.*

110. *See id.*

111. *See id.*

112. *Id.* at *7–8.

113. *Id.* at *11 (citing 17 U.S.C. § 102(b) (2006)) (“In no case does copyright protection for an original work of authorship extend to any idea, procedure, process, system, method of operation, concept, principle, or discovery.”).

and formations themselves.”¹¹⁴

C. SUMMARY OF NINTH CIRCUIT DECISION

The Ninth Circuit affirmed the district court’s ruling.¹¹⁵ The court first affirmed that the two-part extrinsic/intrinsic test was the proper test to determine substantial similarity in this case.¹¹⁶ The court then concluded that without the games’ source code, the jury could not “compare the works to determine substantial similarity.”¹¹⁷ The court noted Antonick did not satisfy his evidentiary burden under the best evidence rule. Under the best evidence rule, Antonick was required to introduce the complete source code of his original work to compare with the allegedly infringing work.¹¹⁸ Moreover, the court found that expert testimony could not satisfy the plaintiff’s burden of proof under the intrinsic prong.¹¹⁹ The court further noted that the lay testimony about the appearance of the games was irrelevant, because Antonick did not assert a copyright interest in Apple II Madden’s audiovisual appearance, but only in its source code.¹²⁰ Therefore, the Court affirmed District Court’s judgment as a matter of law in favor of EA.¹²¹

IV. EXPERT WITNESS ADMISSIBILITY ON OUTSIDE THE NINTH CIRCUIT

As discussed in Part I, the Second Circuit applies the AFC test, which allows expert witnesses when determining substantial similarity.¹²² Although other circuits may use different tests, most also allow expert witnesses to assist the jury to assess substantial similarities. The First, Tenth, and Eleventh Circuits also adopted the AFC test.¹²³ The Fourth and Sixth Circuits adopted the intended audience test, which allows expert testimony when dealing with computer software cases.¹²⁴ Although the Fifth, Seventh, and Eighth Circuits adopted the ordinary observer test, some districts in these circuits still allow

114. *Id.* (citing *Oracle Am., Inc. v. Google Inc.*, 872 F. Supp. 2d 974, 997–98 (N.D. Cal. 2012)) (“[T]here might be a myriad of ways in which a programmer may . . . express the idea embodied in a given subroutine.”).

115. *See Antonick v. Elec. Arts, Inc.*, 841 F.3d 1062, 1064 (9th Cir. 2016).

116. *See id.* at 1065–66.

117. *Id.* at 1066.

118. *See id.* (“There can be no proof of ‘substantial similarity’ and thus of copyright infringement unless Seiler’s works are juxtaposed with Lucas’ and their contents compared.”) (applying the best evidence rule in a copyright action).

119. *See id.* at 1067.

120. *See id.*

121. *See id.* at 1069.

122. *See* discussion *supra* Section II.B.2.

123. *See* discussion *infra* Section IV.A.

124. *See* discussion *infra* Section IV.B.

experts to testify on substantial similarity.¹²⁵ Thus, the most important factor when a court determines whether to allow expert witnesses is the test that the court applies. This Part will discuss software copyright infringement cases that allowed expert testimony across circuits and grouped by the test applied.

A. THE ABSTRACTION, FILTRATION, COMPARISON TEST

Under the AFC test, courts allow experts to testify on the issue of substantial similarity.

1. *The First Circuit*

In *Baystate Technologies v. Bentley System*, Baystate Technologies, a software company that designs computer-aided design (CAD) software sued another software company, Bentley System, alleging that Bentley's data transfer program infringed its CAD software copyright.¹²⁶ The data transfer program was designed to help users transfer data from Baystate's CAD software to Bentley's CAD software.¹²⁷ Both parties offered expert testimony.¹²⁸ The experts agreed that the data structures were, at least to some extent, similar.¹²⁹ However, Baystate's expert opined that these similarities were necessary.¹³⁰

The court allowed the parties to present their expert testimony and adopted the AFC test.¹³¹ The court admitted expert testimony on whether Baystate's data structures were similar to Bentley's.¹³² Based on the expert testimony, the court found that Baystate and Bentley's CAD software were substantially similar.¹³³

2. *The Tenth Circuit*

In *Gates Rubber Co. v. Bando Chemical Industries, Ltd.*, the owner of a copyright for software, Gates Rubber, sued its competitor, Bando Chemical, for infringement.¹³⁴ Bando Chemical had hired a former employee of Gates Rubber to develop a computer program with similar functions.¹³⁵

125. See discussion *infra* Section IV.C.

126. See *Baystate Techs., Inc. v. Bentley Sys., Inc.*, 946 F. Supp. 1079, 1085 (D. Mass. 1996).

127. See *id.* at 1084.

128. See *id.* at 1085.

129. See *id.*

130. See *id.*

131. See *id.* at 1090, 1098.

132. See *id.* ("The documentation contained the data structures which were the subject of the experts' comparisons.").

133. See *id.*

134. See *Gates Rubber Co. v. Bando Chem. Indus., Ltd.*, 9 F.3d 823, 830–31 (10th Cir. 1993).

135. See *id.*

The court in *Gates Rubber* allowed expert testimony and adopted the AFC test.¹³⁶ The court stated, “[g]iven the complexity and ever-changing nature of computer technology, we decline to set forth any strict methodology in the abstraction of computer programs.”¹³⁷ The court further explained, “in most cases[,] we foresee that the use of experts will provide substantial guidance to the court in applying an abstraction test.”¹³⁸ Likewise, the court held that expert testimony should also be considered in the subsequent filtration and comparison steps.¹³⁹

3. *The Eleventh Circuit*

In *CMAX/Cleveland v. UCR*, the owner of a copyright for a computer information system, CMAX, sued a rent-to-own company, UCR, for infringement.¹⁴⁰ UCR first licensed the software from CMAX, but in light of financial considerations and CMAX’s unwillingness to make modifications, later decided to develop its own system.¹⁴¹ CMAX alleged that UCR copied its source code and data files in developing UCR’s own software.¹⁴²

In *UCR*, the Middle District of Georgia adopted the AFC test.¹⁴³ The court allowed both parties to present their expert witness, and the court found that CMAX’s expert gave a more credible testimony.¹⁴⁴ CMAX’s expert concluded that UCR’s software copied the “file structures, record layouts, transaction codes and internal documentation” of the CMAX software.¹⁴⁵ The court ultimately held for CMAX.¹⁴⁶

B. THE INTENDED AUDIENCE TEST

Under the intended audience test, lay observers should not be considered the intended audience in computer software infringement cases. Thus, to aid the trier of fact’s understanding, courts applying the intended audience test allow experts to testify on the question of substantial similarity.

136. *See id.* at 834–35.

137. *Id.*

138. *Id.*

139. *See id.* at 842–45.

140. *See CMAX/Cleveland, Inc. v. UCR, Inc.*, 804 F. Supp. 337 (M.D. Ga. 1992).

141. *See id.*

142. *See id.* at 344.

143. *See id.*

144. *See id.* at 348 (“Having considered the expert testimony presented by both parties regarding the structural similarities that actually exist between the two systems at issue, the Court concludes that Rick Ramsden, Computemax’s expert, gave the best supported and most credible testimony.”).

145. *Id.*

146. *See id.* at 356–57.

1. *The Fourth Circuit*

In *Dawson v. Hinshaw Music*, the Fourth Circuit held that the second step of the *Arnstein* approach should be conducted from the view of an intended audience, instead of lay observers.¹⁴⁷ Although *Dawson* is not a computer software case, the court discussed software copyrights in dicta. The court noted that “the advent of computer programming infringement actions has forced courts to recognize that sometimes the non-interested or uninformed lay observer simply lacks the necessary expertise to determine similarities or differences between products.”¹⁴⁸ Citing a Third Circuit opinion, the *Dawson* court noted that “the complexity of computer programs, combined with the general public’s unfamiliarity with such programs, rendered the ordinary observer test senseless.”¹⁴⁹ The court concluded that “only a reckless indifference to common sense would lead a court to embrace a doctrine that requires a copyright case to turn on the opinion of someone who is ignorant of the relevant differences and similarities between two works.”¹⁵⁰ Thus, the *Dawson* court explicitly embraced expert testimony in computer software copyright infringement cases.¹⁵¹

2. *The Sixth Circuit*

The Sixth Circuit did not have its own specific test for determining substantial similarity in copyright cases until 2003 when it set forth a two-step test.¹⁵² Under this test, courts first filter out unoriginal, unprotectable elements, then look at the substantial similarity of the works from the perspective of the intended audience.¹⁵³

a) *SAS Institute, Inc. v. S&H Computer Systems, Inc.*

In *SAS Institute v. S&H*, decided before 2003, the Middle District of Tennessee applied the ordinary observer test.¹⁵⁴ SAS, the owner of a copyright for statistical analysis software, brought the infringement suit against S&H, its

147. See *Dawson v. Hinshaw Music Inc.*, 905 F.2d 731, 734 (4th Cir. 1990) (“[W]e think it sensible to embrace *Arnstein’s* command that the ultimate comparison of the works at issue be oriented towards the works’ intended audience.”).

148. *Id.* at 735.

149. *Id.* at 735 (citing *Whelan Associates v. Jaslow Dental Lab., Inc.*, 797 F.2d 1222 (3rd Cir. 1986)).

150. *Id.*

151. See *id.* (“He further reasoned that where the finder of fact is the same for both the extrinsic and intrinsic tests, it seems silly to ask the finder of fact to ‘forget’ the expert testimony when considering similarity of expression.”).

152. See *Kohus v. Mariol*, 328 F.3d 848, 854 (6th Cir. 2003).

153. See *id.* at 857.

154. See *SAS Inst., Inc. v. S & H Comput. Sys., Inc.*, 605 F. Supp. 816, 818 (M.D. Tenn. 1985).

competitor.¹⁵⁵ Although the ordinary observer test does not allow expert testimony, the Middle District of Tennessee nevertheless allowed experts to testify on the question of substantial similarity, and in fact, appointed an expert to assist the court.¹⁵⁶ SAS's expert testified that "early source code for the S&H product was substantially similar to the source code for SAS."¹⁵⁷ The court ultimately found that the plaintiff's expert's testimony was credible.¹⁵⁸

b) *Kobus v. Mariol*

The Sixth Circuit first mandated its two-step test in *Kobus*.¹⁵⁹ In the first step, similar to the first step in the AFC test, the court must identify which aspects of the plaintiff's work are protected by copyright.¹⁶⁰ After the court filters out the unprotectable elements, the court then looks at the substantial similarity of the works.¹⁶¹

Endorsing the Fourth Circuit's approach, the Sixth Circuit made clear that the second step should be directed to the perspective of the intended audience.¹⁶² Following *Dawson*, the court reasoned that "[t]he ordinary observer test is based on the economic incentive view of copyright law, that the 'purpose of the copyright laws is to provide creators with a financial incentive to create for the ultimate benefit of the public.'¹⁶³ The court noted that the *Arnstein* test was "designed for cases where the lay audience purchases the product at issue, and where the lay audience's untutored judgment determines whether the product will sell."¹⁶⁴ The court further noticed that in cases "where the target audience possesses specialized expertise . . . the specialist's perception of similarity may be much different from the lay observer's, and it is appropriate in such cases to consider similarity from the specialist's perspective."¹⁶⁵ On the admissibility of expert witnesses, the court held that "[e]xpert testimony will usually be necessary to educate the trier of fact in those elements for which the specialist will look."¹⁶⁶

155. *See id.* at 817.

156. *See id.* at 817–18; *cf.* *Arnstein v. Porter*, 154 F.2d 464, 468 (2d Cir. 1946).

157. *SAS Inst.*, 605 F. Supp. at 822.

158. *See id.*

159. *See* *Kobus v. Mariol*, 328 F.3d 848, 855 (6th Cir. 2003).

160. *See id.*

161. *See id.*

162. *See id.* at 857 ("The larger principle here is that the inquiry in the second prong of the substantial similarity test should focus on the intended audience.").

163. *Id.* at 856 (internal corrections omitted) (quoting *Dawson v. Hinshaw Music, Inc.*, 905 F.2d 731, 733 (4th Cir. 1990)).

164. *Id.*

165. *Id.* at 857.

166. *Id.*

C. THE ORDINARY OBSERVER TEST

As discussed earlier, under the ordinary observer test, courts look at whether, in the lay observer's view, the works are substantially similar, showing that the defendant unlawfully appropriated the plaintiff's work.¹⁶⁷ Expert testimony is not admissible under this test. However, several districts applying the ordinary observer test allowed expert witnesses to testify on the question of substantial similarity in software copyright infringement cases.

1. *The Fifth Circuit*

In *Seastrunk v. Darwell Integrated Tech.*, the owner of a copyright for air conditioner monitoring software, Seastrunk, brought the infringement action against Darwell, alleging that Darwell had copied his source code in developing its own version of monitoring software.¹⁶⁸

The Northern District of Texas allowed Seastrunk's expert to testify, but ultimately found the testimony that the parties' software was substantially similar not credible.¹⁶⁹ The court noted that Darwell's rebuttal expert "pointed out several instances where [Seastrunk's expert] found substantial similarity that [was] actually standard in the industry or dictated by third-party hardware."¹⁷⁰ Subsequently, the court found that Seastrunk failed to show that Darwell's software was substantially similar to his own.¹⁷¹

2. *The Seventh Circuit*

In *Century Consultants v. Miller Group*, the owner of a copyright for school administration software, Century, brought an infringement action against its licensee, Miller, for violating the license agreement.¹⁷² Specifically, Century alleged that Miller had improperly used Century's source code and structures in violation of the licensing agreement while developing its own school management software.¹⁷³

The Central District of Illinois allowed Century's expert to testify on the question of substantial similarity.¹⁷⁴ The expert opined that "all the programs contained substantial similarities, including similar language, structure, and

167. See discussion *supra* Section II.B.2.

168. See *Seastrunk v. Darwell Integrated Tech., Inc.*, No. 3:05-CV-0531, 2008 WL 898766 (N.D. Tex. Mar. 28, 2008).

169. See *id.* at *4.

170. *Id.*

171. See *id.* at *9–10.

172. See *Century Consultants, Ltd. v. Miller Grp., Inc.*, 2008 WL 345541, at *5 (C.D. Ill. Feb. 7, 2008).

173. See *id.*

174. See *id.*

logic.”¹⁷⁵ He thus concluded that Miller’s school management software was “developed from” Century’s software.¹⁷⁶ The court subsequently granted summary judgment in favor of Century because Miller did not provide any expert testimony to rebut Century’s allegations.¹⁷⁷

3. *The Eighth Circuit*

Although the Eighth Circuit applies a general *Arnstein* test, in *E.F. Johnson Co. v. Uniden Corp. of America*, the District of Minnesota allowed expert testimony on substantial similarity.¹⁷⁸ In *E.F. Johnson*, the owner of a software copyright for a radio system, E.F. Johnson, brought an infringement action against its competitor, Uniden.¹⁷⁹ E.F. Johnson’s radio system had been on the market for some time when Uniden’s system was released.¹⁸⁰ After a thorough comparison of the products, E.F. Johnson’s engineers concluded that Uniden had copied their software.¹⁸¹

The court allowed experts to testify on the issue of substantial similarity, finding that “[b]ecause a copyrighted computer program is stored on a computer chip or disc well-hidden from public view, application of the ordinary observer test in a computer software context has proven problematical.”¹⁸² The court held that “[t]he fiction of the lay observer is thus abandoned in favor of an analysis of similarities and differences in the copyrighted and allegedly offending computer programs.”¹⁸³ With the aid of experts, the court concluded that Uniden’s radio system was substantially similar to E.F. Johnson’s.¹⁸⁴

V. DISCUSSION

Expert witnesses play a crucial role in software intellectual property litigations. Rule 702 of the Federal Rules of Evidence provides:

If 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,

175. *Id.*

176. *Id.*

177. *See id.* at *6.

178. *See E.F. Johnson Co. v. Uniden Corp. of America*, 623 F. Supp. 1485 (D. Minn. 1985).

179. *See id.* at 1486.

180. *See id.* at 1490.

181. *See id.* at 1490.

182. *Id.* at 1493.

183. *Id.*

184. *See id.*

training, or education, may testify thereto in the form of an opinion or otherwise.¹⁸⁵

It is a long-established rule in patent litigation that expert testimony is allowed to help the trier of fact understand technical terms.¹⁸⁶ Expert witnesses are crucial for translating technical jargon understood by those skilled in the art into terms comprehensible to courts and lay juries. In fact, some courts even allowed expert witnesses to testify on legal issues such as obviousness and infringement.¹⁸⁷

Although copyright and patent protections differ in several aspects, both require courts and juries to understand the content of the works in question. It is well-established that copyright extends to certain non-literal expressions. In non-literal software infringement cases, courts cannot determine substantial similarity without first understanding the technical aspects of the original and allegedly infringing works. As discussed in Part IV, with the exception of the Third and Ninth Circuits, most courts allow expert witness testimony when determining substantial similarity in software copyright infringement. In contrast, the Third and Ninth Circuits follow rules developed in other contexts that fail to consider the highly technical nature of computer software.

In *Antonick*, the District Court reasoned, and the Ninth Circuit agreed, that “the jury had no evidence of Apple II Madden or Sega Madden as a whole to enable it to make this subjective comparison.”¹⁸⁸ The court pointed out that “[b]y failing to offer evidence of the games in their entirety, Antonick’s proof on Question 2 (the intrinsic prong) was insufficient.”¹⁸⁹ However, the jury would not be able to make this subjective comparison with or without the complete source code, unless an expert witness is allowed to testify.

First, source code does not present the viewer with a subjective impression. Different from literary or visual works, which usually give an overall impression to viewers, source code leaves untrained readers with confusion, at most. Second, even if source code could have a total concept and feel, an average juror without formal training in programming could not understand the source code without the aid of an expert. Further, in *Antonick*, the source codes in question were in different programming languages—much

185. FED. R. EVID. 702.

186. See *Seymour v. Osborne*, 78 U.S. 516, 516 (1870); JOHN GLADSTONE MILLS III, DONALD C. REILEY III, ROBERT CLARE HIGHLEY & PETER D. ROSENBERG, 6 PATENT LAW FUNDAMENTALS § 20:105 (2d ed. 2018).

187. See *Marvin Glass & Assocs. v. Sears, Roebuck & Co.*, 318 F. Supp. 1089 (S.D. Tex. 1970).

188. *Antonick v. Elec. Arts Inc.*, No. C 11-1543 CRB, 2014 WL 245018, at *7 (N.D. Cal. Jan. 22, 2014).

189. *Id.*

like a literal work written in different languages. It would be fruitless for lay jurors to evaluate substantial similarities of a novel written in Japanese and Russian unless they happen to know both languages. In this analogy, even if the infringing work is a literal translation of the original work, which is clearly subject to copyright protection,¹⁹⁰ the jurors who do not speak the two languages in question would not be able to find the similarity. Likewise, in the computer source code context, the jurors who do not know the programming languages in question would not recognize any similarities. Without an expert's help, a lay jury would be inclined to compare the works literally, which would lead to overly narrow copyright protection.

A. THE CONSEQUENCE OF EXCLUDING EXPERT TESTIMONY IN
COPYRIGHT INFRINGEMENT

Excluding expert testimony in substantial similarity determinations frustrates the primary purpose of copyright—"to promote the Progress of Science and useful Arts."¹⁹¹ As the Supreme Court explained in *Mazer v. Stein*, "[t]he economic philosophy . . . is the conviction that encouragement of individual effort by personal gain is the best way to advance public welfare."¹⁹² Thus, the monopoly right granted to authors plays a crucial role in advancing copyright's purpose.¹⁹³

As discussed earlier, excluding expert testimony in determining substantial similarity would lead to an elevated infringement standard, which would under-protect the copyright owner's exclusive rights granted by Congress. Moreover, excluding expert testimony would also promote uncertainty in copyright litigation outcomes. Without the aid of an expert, the trier of fact is unlikely to understand the organization, workflow, and structure of source code, which may result in arbitrary infringement determinations. Uncertainty in copyright doctrine would further frustrate the purpose of the copyright system because authors will not know for sure whether their works would be protected under copyright law.

VI. CONCLUSION

Software copyrights present a unique challenge for infringement actions because of the specialized knowledge required to understand the works at issue. Specifically, software source code does not present the viewer with an overall

190. *See* *Itar-Tass Russian News Agency v. Russian Kurier, Inc.*, 153 F.3d at 82 (2d Cir. 1998).

191. U.S. CONST. art. I, § 8 cl. 8.

192. *Mazer v. Stein*, 347 U.S. 201, 219 (1954).

193. *See* 1 NIMMER & NIMMER, NIMMER ON COPYRIGHT § 1.03 (Matthew Bender, Rev. Ed. 2017).

impression, and ordinary lay observers do not possess the expertise to compare computer programs and decide whether they are substantially similar. Therefore, most courts in the U.S. agree that expert testimony should be allowed when determining substantial similarity. Excluding expert testimony would result in under-protection of software copyright and create uncertainty in copyright infringement litigations, both of which are detrimental to the copyright system. Thus, without expert aid, software copyright is insufficient to promote “the Progress of Science and useful Arts.”

The Ninth Circuit is in the minority of U.S. courts in that it excludes expert testimony from key determination in software copyright infringement cases. The Ninth Circuit must reconsider its copyright infringement test and allow expert testimony in determining the issue of substantial similarity between software source code. Otherwise, the Ninth Circuit’s current rule risks incorrect case outcomes and harm to software innovation.

