No. 21-12835

United States Court of Appeals

for the

Eleventh Circuit

APPLE INC.,

Plaintiff-Counter Defendant-Appellant,

– v. –

CORELLIUM, LLC,

Defendant-Counter Claimant-Appellee.

ON APPEAL FROM THE UNITED STATES DISTRICT COURT
FOR THE SOUTHERN DISTRICT OF FLORIDA
DISTRICT 113C-9, CASE NO. 9:19-CV-81160-RS HONORABLE RODNEY SMITH

AMICUS CURIAE BRIEF OF SOFTWARE PRESERVATION NETWORK, AMERICAN LIBRARY ASSOCIATION, ASSOCIATION OF COLLEGE AND RESEARCH LIBRARIES, ASSOCIATION OF RESEARCH LIBRARIES, AND LIBRARY FUTURES INSTITUTE IN SUPPORT OF DEFENDANT-COUNTER CLAIMANT-APPELLEE CORELLIUM, LLC AND AFFIRMANCE

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CERTIFICATE OF INTERESTED PERSONS
AND CORPORATE DISCLOSURE STATEMENT

The undersigned counsel of record certifies that the following listed persons and entities as described in Eleventh Circuit Rule 26.1-2(a) have an interest in the outcome of this case, and were omitted from the Certificates of Interested Persons in briefs that were previously filed pursuant to Rule 26.1-2(b).

1. Butler, Brandon - Brandon Butler LLC
2. The American Library Association
3. The Association of College and Research Libraries
4. The Association of Research Libraries
5. The Library Futures Institute
6. The Software Preservation Network

As required by Federal Rule of Appellate Procedure 26.1 and Eleventh Circuit Rule 26.1, Amici Curiae certify that, apart from undisclosed members of Appellees, no publicly traded company or corporation has an interest in the outcome of this case or appeal. Amici Curiae further certify that they have no parent corporation, and no publicly held corporation owns 10% or more of their stock.

Respectfully submitted,
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IDENTITY OF *AMICI CURIAE* AND THEIR INTEREST IN THIS CASE[1]

The Software Preservation Network ("SPN") is a non-profit organization established to advance software preservation through collective action. Its 20 institutional members are libraries, museums, and archives on the cutting edge of software preservation. These institutions rely on fair use to permit almost every aspect of their software preservation practice.

The American Library Association ("ALA"), established in 1876, is a nonprofit professional organization of more than 57,000 librarians, library trustees, and other friends of libraries dedicated to providing and improving library services and promoting the public interest in a free and open information society.

The Association of College and Research Libraries ("ACRL"), the largest division of the ALA, is a professional association of academic and research librarians and other interested individuals. It is dedicated to enhancing the ability of academic library and information professionals to serve the information needs of the higher education community and to improve learning, teaching, and research.

The Association of Research Libraries ("ARL") is an association of 124 research libraries in North America. ARL's members include university libraries,

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[1] The parties have consented to the filing of this brief. Neither the parties nor their counsel have authored this brief, and neither they nor any other person or entity other than amici curiae contributed money that was intended to fund preparing or submitting this brief.

public libraries, government and national libraries. ARL programs and services promote equitable access to and effective use of recorded knowledge in support of teaching and research.

The Library Futures Institute is a nonprofit organization that champions the right to equitable access to knowledge. Its mission is to empower libraries to take control of their digital futures. It enables collective action while building power through an advocacy organization. Library Futures Institute responds to 21st century needs, operates at the speed of change, and levels the playing field between publishers and the public.

Collectively, these associations represent over 100,000 libraries and 350,000 librarians, archivists, curators, and other personnel that serve the needs of their patrons in the digital age. As a result, the associations share a strong interest in the balanced application of copyright law to software and software-dependent works. Cultural heritage institutions and the users they serve are especially dependent on a robust and stable fair use right. They intervene here to provide the court with additional information about the implications of this case for cultural heritage, and to share the consensus views of the cultural heritage sector on fair use and software.

STATEMENT OF ISSUES

1. Whether the district court erred in granting summary judgment to Corellium on its fair use defense.

2. Whether the district court erred in granting summary judgment to Corellium regarding Apple's claims of contributory infringement.

SUMMARY OF ARGUMENT

Much of the cultural heritage of the last century and of future centuries will be lost if libraries, museums, archives, and others cannot lawfully preserve software for research and reuse. Indeed, some of the cultural heritage of the last century is already lost or in grave danger because it consists of or relies on software that has not been preserved or made accessible. *See generally* Digital Preservation Coalition, The 'Bit List' of Digitally Endangered Species, https://www.dpconline.org/digipres/champion-digital-preservation/bit-list (last visited December 14, 2021). The copyright monopoly can provide rightsholders a useful incentive to create and publish new works, but unlimited rightsholder control would chill preservation and research access, putting software and all digital cultural heritage at risk. As the Supreme Court recently explained, "exclusive rights in computer programs are limited like any other works," and "fair use can play an important role in determining the lawful scope of a computer program copyright." *Google LLC v. Oracle Am., Inc.*, 141 S. Ct. 1183, 1199

(2021). *Google* also enshrined the importance of fair use as a check on software vendors' market power, a core concern of the Commission on New Technological Uses, whose report resulted in the inclusion of computer programs within copyright's subject matter. *Id.* at 1198 (software "copyright 'should not grant anyone more economic power than is necessary to achieve the incentive to create.'"). The district court rightly recognized that access for research is a protected fair use of software, and this court should affirm that holding.

Appellant's arguments against fair use fly in the face of precedent, up to and including *Google*. Fair use requires neither the abridgement nor the alteration of the work used. The transformation in "transformative use," which lies at the heart of the protection offered by the fair use doctrine, refers not to literal alteration but to the presence of "something new and important" in the user's purpose. *Google*, 141 S. Ct. at 1203. In evaluating whether software is used transformatively, courts must "go further" to examine not just the most basic functionality of the software (which will remain the same across all uses), but the "more specifically described 'purpose[s]' and 'character'" of the secondary user. *Google*, 141 S. Ct. at 1203. Anything less "would severely limit the scope of fair use in the functional context of computer programs," placing core fair uses, including use "for teaching or research," at risk. *Id.* The purpose of the secondary use here is research, which has been found to be a transformative purpose where the works used were not

originally intended for research. A rightsholder cannot block transformative uses merely by setting up its own licensed competitor, nor can it chill transformative services by threatening secondary liability for all user activities.

Cultural heritage institutions rely on fair use for routine preservation and research support activities, especially for digital materials. Digital preservation inevitably requires making copies, adaptations, and (when access is provided) distributions, public displays, and public performances of in-copyright works. Without these interventions, works will be lost as fragile digital media deteriorates and becomes obsolete. Since all digital files rely on software to render them perceptible to humans, the preservation and use of original software is an essential part of the cultural heritage sector's strategy for preservation and research use of digital cultural heritage. Literary archives, business records, public records, works of fine art and design, and virtually all other varieties of research objects are now primarily created and stored in digital formats. Emulation technology enables preservation and research access to digital materials beyond the lifespan of fragile and obsolete hardware. If fair use is applied reasonably and consistent with precedent, libraries, archives, and museums can carry out their traditional missions and ensure long-term preservation and access to digital cultural heritage. If copyright holders are given absolute control over research uses, digital cultural heritage could be lost forever.

ARGUMENT

I. FAIR USE PROTECTS EMULATION-ENABLED ACCESS TO SOFTWARE FOR RESEARCH

The district court correctly applied established fair use principles to Corellium's security research service. Fair use is critical to the balanced application of copyright to research, and libraries, archives, and museums rely on fair use every day. The Supreme Court clarified and strengthened the application of fair use to software in *Google*.

A. *Google* Explains Why Transformative Use Analysis of Software Must "Go Further" To Protect Fair Use, Especially For Research

As this court considers the proper application of fair use to software, a key holding from *Google* should be borne in mind. Appellants point out repeatedly that Corellium "openly seeks to replicate iOS," that is, when the iOS software runs in the Corellium platform, it does the same thing that it does on a consumer device. Appellant's Br. at 9. This is not surprising; if iOS behaved differently on the Corellium platform, security researchers could not rely on it for accurate insights into the software's operation. By the same token, the Supreme Court observed in *Google* that the company used portions of Java "in part for the same reason" that Sun had created it: to trigger certain implementing programs. *Google*, 141 S. Ct. at 1203. Otherwise, developers would not have been able to transfer their skills to the new Android platform.

Noting this persistence of functionality, the Supreme Court cautioned that "since virtually any unauthorized use of a copyrighted computer program (say, *for teaching or research*) would do the same, to stop here would severely limit the scope of fair use in the functional context of computer programs." *Id*. (emphasis added). A computer program is by definition a functional work, "used…to bring about a certain result." 17 U.S.C. § 101. Accordingly, every time a computer program is used, it performs its function. If courts equate "purpose" for fair use analysis to "function" at this basic level, they will never find the novelty of purpose that is required for transformative use, endangering core fair use activities like teaching and research. *Google* directs courts: "in determining whether a use is 'transformative,' we must go further and examine the copying's more specifically described 'purpose[s]' and 'character.'" *Id*. Running iOS in an emulated environment may replicate the functionality of iOS on an iPhone or iPad, but the "more specifically described" purpose and character of Corellium's use is providing emulated access to iOS for security research. It is this purpose that the court must evaluate in determining whether the use is transformative.

B. Research Support Is a Transformative Purpose Where the Works Used Were Not Created or Sold To Support Research

The preamble to the fair use provision lists "criticism, comment, news reporting, teaching (including multiple copies for classroom use), scholarship, or research" as exemplary fair use purposes. 17 U.S.C. § 107. Because use for these

purposes typically "'fulfill[s] the objective of copyright law to stimulate creativity for public illumination,'" and "adds something new and important," it is highly likely to be transformative. *Google*, 141 S. Ct. at 1203 (quoting Pierre Leval, *Toward a Fair Use Standard*, 103 Harv. L. Rev. 1105, 1111 (1991)). Such uses therefore "lie at the heart of the fair use doctrine's guarantee of breathing space within the confines of copyright." *Campbell v. Acuff-Rose*, 510 U.S. 569, 579 (1994).

Not every use for research or education is necessarily transformative, of course. In *Cambridge Univ. Press v. Patton*, 769 F.3d 1232 (11th Cir 2014), this court examined faculty sharing of excerpts from scholarly books with students in university courses. It found that the works at issue were originally created and published at least in part to be used as "reading material for students in university courses." *Patton*, 769 F.3d at 1263. Moreover, the University did not argue that the works were assigned or read for a transformative purpose. On that record, the court concluded that the use was not transformative. Notably, the district court nevertheless found on remand that the vast majority of uses at issue were fair, citing the importance of enabling teaching and research, together with the scant evidence of market harm, the appropriate amount used in light of the educational purpose, and other factors. *Cambridge Univ. Press v. Becker*, 446 F.Supp.3d 1145 (N.D. Ga. 2020).

On the question of transformative use, providing access to consumer software in a specialized environment suitable for research is easily distinguished from the use in *Patton*. Unlike the authors and publishers in *Patton,* Appellant does not create or market iOS as an object of study for researchers. iOS is designed for ordinary consumers who own Apple's touchscreen devices and made freely available to them to facilitate use of Apple hardware. Like many fair uses, security research is orthogonal to anticipated consumer uses of iOS; it is not substitutional or superceding. Taken together, these considerations support a finding that facilitating research use of iOS is transformative.

C. Use Of Entire Software Works Is Fair When It Is Appropriate For Non-Superseding Research.

Appellants argue that Corellium's use cannot be transformative or fair because its service enables security researchers to access and interact with the entirety of iOS, unaltered and unabridged. *See, e.g.,* Appellant's Br. at 26 ("Corellium's avowed goal is not to transform iOS, but to reproduce it as precisely as possible."). This is simply not the law. Since the concept of transformative use was first adopted by the Supreme Court in *Campbell*, courts have recognized that "transformative" is a term of art that does not require literal alteration or abridgement of the work at issue. *See, e.g., Katz v. Google, Inc.*, 802 F.3d 1178, 1183 (11th Cir. 2015) ("'The use of a copyrighted work need not alter or augment the work to be transformative in nature.'") (quoting *A.V. ex rel. Vanderhye v.*

iParadigms, LLC, 562 F.3d 630, 639 (4th Cir. 2009); *Perfect 10, Inc. v. Amazon.com, Inc.*, 508 F.3d 1146 (9th Cir 2007) (reproducing entire unaltered images for use in image search engine was transformative); *Nuñez v. Caribbean Int'l News Corp*., 235 F.3d 18 (1st Cir. 2000) (reproducing entire unaltered modeling photograph as part of news report was transformative); *A.V. ex rel. Vanderhye v. iParadigms, LLC*, 562 F.3d 630 (4th Cir. 2009) (reproducing entire unaltered student papers as part of a plagiarism detection service was transformative).

The Supreme Court reiterated this principle in *Google*, explaining that although Google had copied Oracle's copyrighted code "precisely" as part of its Android software, its transformative nature depended on "the copying's more specifically described 'purpose[s]' and 'character,'" not whether the code had been altered. *Google*, 141 S. Ct. at 1203. The Court also reiterated that "copying a larger amount of material can fall within the scope of fair use where the material copied…is central to a copier's valid purpose." *Id*. at 1205. As this court explained in *Peter Letterese & Assocs. v. World Inst. of Scientology Enters*., 533 F.3d 1287, 1323 n.30 (11th Cir. 2008), the amount of a work that may be reproduced for a particular fair use depends on "whether the amount taken is reasonable in light of the purpose of the use and the likelihood of market substitution." Courts have vindicated fair use of entire works in circumstances ranging from preservation to

biography to news reporting. *See Warren Publ'g. Co. v. Spurlock*, 645 F.Supp. 402 (2009) (reproducing entire paintings in context of artist biography was fair); *Swatch Grp. Mgmt. Servs. v. Bloomberg L.P.*, 756 F.3d 73 (2d Cir. 2014) (publishing entire audio recording of earnings call in news report was fair); *Authors Guild, Inc. v. HathiTrust*, 755 F.3d 87 (2d Cir. 2014) (copying full text of books in library collections for preservation, research, and accessibility was fair).

Courts have found uses of complete, unaltered works for research purposes to be fair use. In *White v. W. Publ'g Corp.*, 29 F. Supp. 3d 396 (S.D.N.Y. 2014), for example, the court held that Reed Elsevier and West Publishing could rely on fair use to "creat[e] an interactive legal research tool" that permits researchers to examine the full text of legal briefs, contrasting legal research with the briefs' original purpose "of providing legal services to…clients and securing specific legal outcomes." The court also noted approvingly the value added to the briefs by the databases' "processes of reviewing, selecting, converting, coding, linking, and identifying the documents." *Id.* As the district court observed below, Corellium similarly undertakes substantial efforts to add value to iOS, enabling researchers to examine the software in ways not possible when the software runs in its intended context, on an Apple touchscreen device. Doc. 783, pg. 23. *See also Sundeman v. Seajay Soc'y, Inc.*, 142 F.3d 194 (4th Cir. 1998) (research access to unpublished manuscript served a transformative scholarly purpose); *Am. Inst. of Physics v.*

Winstead PC, No. 3:12-CV-1230-M, 2013 U.S. Dist. LEXIS 169929 (N.D. Tex. Dec. 3, 2013) (use of academic journal articles by attorneys in the patent examination process was transformative); *Am. Inst. of Physics v. Schwegman*, No. 12-528 (RHK/JJK), 2013 U.S. Dist. LEXIS 124254 (D. Minn. Aug. 30, 2013) (same).

Transformative research use of software will typically require use of the entire work. Fragments of software code may not run properly or at all, making it impossible to examine the software in operation. Even if software that is abridged or modified could be made to run, it may not run in the same way as a complete copy, making it impossible to draw reliable conclusions about the functioning of complete software from the study of partial copies. Even seemingly separable elements, like wallpaper or screensavers, can be a valid subject of investigation, and may have unexpected or unintended impacts on the functioning of the rest of the computer program. Where software is required as a dependency for research use of other digital files (see Section II. A., infra), use of less than the entire work may not enable reliable, authentic access to those files, if it enables access at all. Thus, the entire software work will almost always be the appropriate amount for use in a transformative research context.

D. Rightsholders Cannot Use Copyright to Monopolize Research About Their Works

The *Google* opinion explains that "fair use can play an important role in determining the lawful scope of a computer program copyright," and that fair use as applied to software should "carry out its basic purpose of providing a context-based check that can help to keep a copyright monopoly within its lawful bounds." *Google*, 141 S. Ct. at 1198. The copyright monopoly exceeds its bounds when "further protection creates unrelated or illegitimate harms in other markets or to the development of other products." *Id.* Appellant argues that its own security research products and services are harmed by Corellium's unlicensed use of iOS, contending in effect that its copyright monopoly over iOS should give it a monopoly over research about iOS. *Google* closes off this line of reasoning, and instead instructs courts to apply fair use to prevent software copyright from squelching competition, discovery, and innovation. When unfettered copyright threatens to "interfere with, not further, copyright's basic creativity objectives," fair use must restore balance. *Google,* 141 S.Ct. at 1208. *See also Patton,* 769 F.3d at 1276 ("[t]he goal of copyright is to stimulate the creation of new works, not to furnish copyright holders with control over all markets"); *Bill Graham Archives, LLC v. Dorling Kindersley Ltd.*, 386 F. Supp. 2d 324, 332-33 (S.D.N.Y. 2005) (finding no cognizable market harm where the use "is transformative, and is not likely to supplant the market, either for reproductions or derivative works, of the

original"); *Castle Rock Entm't., Inc. v. Carol Publ'g Grp. Inc.*, 150 F.3d 132, 146 n.11 (2d Cir. 1998) ("by developing or licensing a market for parody, news reporting, educational or other transformative uses of its own creative work, a copyright owner plainly cannot prevent others from entering those fair use markets"); *Am. Geophysical Union v. Texaco Inc*., 60 F.3d 913, 930 (2d Cir. 1994) ("only an impact on potential licensing revenues for traditional, reasonable, or likely to be developed markets should be legally cognizable" under the fourth factor).

E. Overbroad Application of Secondary Liability Would Cast A Pall Over Cultural Heritage Institutions

Appellant alleges Corellium encourages its users to use what they learn by studying iOS on the Corellium platform in malicious ways (to "develop[]…iOS exploits"). Appellant's Br. at 57. Appellant then argues that, to win summary judgment on a claim of secondary liability for alleged infringement by its users, Corellium is required to "show that there is no dispute about what every single one of its customers (and trial account users) do." Appellant's Br. at 56. But the key issue for secondary liability for copyright infringement in this context is the platform's alleged encouragement, not the alleged actions of "every single one" of its users. *See MGM Studios Inc. v. Grokster,* 545 U.S. 913, 918 (2005); *Sony Corp. of Am. v. Universal City Studios, Inc*., 464 U.S. 417, 442 (1984) (mere distribution of technology "capable of substantial noninfringing uses" does not trigger

secondary liability). No technology provider, nor any provider of access to information, could or should be liable for the actions of "every single one" of its users. If the bad acts of a single researcher or library patron were sufficient to trigger liability for copyright's draconian statutory damages, libraries and archives would be unable to conduct their core, traditional activities. The principles in *Sony* and *Grokster* ensure that these activities can continue.

II. FAIR USE OF SOFTWARE IS ESSENTIAL TO CULTURAL HERITAGE PRESERVATION AND RESEARCH

Cultural heritage institutions and their users rely on fair use in almost all of their preservation and research support activities, but the fair use right becomes especially important in the preservation of digital works. Preserving and providing research access not only to software itself but to all digital materials involves reproduction, adaptation, distribution, and public performances and displays of software, raising copyright concerns that can be daunting for cultural heritage institutions. *See generally* Patricia Aufderheide et al., *Code of Best Practices in Fair Use for Software Preservation* (rev'd 2019), available at https://www.arl.org/resources/code-of-best-practices-in-fair-use-for-software-preservation/. In these circumstances, "rigid application of the copyright statute…would stifle the very creativity which that law is designed to foster." *Campbell*, 510 U.S. at 577. Fair use gives cultural heritage institutions "breathing space within the confines of copyright." *Id.* at 579. Indeed, the U.S. Copyright

Office has recognized that fair use supports preservation of software and software-dependent cultural heritage.[2] Appellant's view of fair use would close off that breathing space and put digital cultural heritage at increased risk of irreversible loss.

A. All Digital Cultural Heritage Is Software-Dependent.

Information stored in digital media cannot be accessed directly by humans. Like the holes punched in a piano roll or the groove in a vinyl record, the 1s and 0s of digital "copies" must be converted into perceptible form "with the aid of a machine or device." 17 U.S.C. § 101. Emulation technology like Corellium's can

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[2] The U.S. Copyright Office administers a triennial rulemaking process that results in exemptions from the anti-circumvention provisions of the Digital Millennium Copyright Act. 17 U.S.C. § 1201(a)(1)(C). The rules permit circumvention of effective technical protection measures encumbering copies of in-copyright works in specific circumstances where the Librarian of Congress, with advice from the Copyright Office and the National Telecommunications and Information Administration, concludes the uses are lawful and would be unduly burdened by enforcement of the bar on circumvention. Since their inception, these rules have included some form of protection for preservation of software by libraries and archives. *See* U.S. Copyright Office, Exemption to Prohibition on Circumvention of Copyright Protection Systems for Access Control Technologies: Recommendation of the Register of Copyrights, 65 Fed. Reg. 64556, 64565 (Oct. 27, 2000) (observing that without proposed exemption, libraries and archives "may be prevented from engaging in noninfringing uses of archiving and preservation of works protected by access controls that are obsolete or malfunctioning."); U.S. Copyright Office, Section 1201 Rulemaking: Eighth Triennial Proceeding Recommendation of the Register of Copyrights (Oct. 28, 2021) (recommending reauthorization and expansion, respectively, of exemptions for video game and software preservation).

help overcome hardware dependency, making it possible to render files without the physical machines they originally required, but this is less than half of the challenge for rendering digital files. A digital file can only be rendered accurately by software that is designed to read the file. Without the right software, a digital file is meaningless gibberish and the work it encodes is inaccessible to humans.

"Digital file" is too dry a word for what's at stake. The vast majority of 21st Century history and culture, and much of the 20th Century, too, is encoded in digital files. From the architectural designs of Frank Gehry to the emails of the Enron Corporation, from works of high visual art to viral cat memes, from the President's emails to the tweets of Syrian democracy activists, all were created and stored in digital files. Our cultural heritage is predominantly contained in digital files, and it will be for the foreseeable future.

Software engineers and preservationists call a piece of software that is required for the proper working of another piece of software or the rendering of a file a "dependency." A digital file often requires a "stack" of software dependencies: an operating system, a set of drivers, and multiple applications and libraries may be involved in fully and faithfully rendering a digital media file. These elements may have dependencies of their own. Sometimes new software is developed to render files originally created with older software to overcome that dependency, but important information is inevitably lost in translation. *See*

generally Euan Cochrane, *Rendering Matters* (2012) *available at* https://perma.cc/8G3C-6PT5. Preservation and research access to digital cultural heritage requires the preservation and research use of the full panoply of original software elements involved in creating and reading digital files. Anything less and we could be plunged into a digital dark age, our culture inaccessible to future generations.

B. Software Is Cultural Heritage

Libraries, archives, and museums preserve software not only to render digital media, but also to serve as the subject of research. *See* Matthew Fuller, *Software Studies: A Lexicon* 3 (2008) (describing the "need to gather and make palpable a range of associations and interpretations of software to be understood and experimented with"). Historians, sociologists, computer scientists, and many other scholars study software to develop new insights into its development, its cultural context, and any number of other issues of scholarly concern. Distinguished research institutions hold significant collections of software works that they make available in support of teaching and research, just as they collect, preserve, and provide access to other kinds of works. *See, e.g.*, Georgia Tech Library, retroTECH Collection Development Policy, https://www.library.gatech.edu/sites/default/files/2019-01/retroTECH_Collection_Development_Policy_20160716.pdf (last visited Dec.

9, 2021) ("The vision for the retroTECH Lab entails a highly curated combination of classic, vintage hardware and software and modern tools for digital archiving and emulation, all designed to be accessed and used"); Stephen M. Cabrinety Collection in the History of Microcomputing, circa 1975-1995, Stanford University Library, https://searchworks.stanford.edu/view/4084859 (last visited Dec. 20, 2021).

Video games alone represent an enormous trove of cultural production, and a rich field for academic study. Video game software collections represent the work of thousands of creators, the gaming cultures and subcultures of millions of dedicated fans, and a business sector that generates billions of dollars in revenue annually. *See* Jerome McDonough et al., Preserving Virtual Worlds Final Report 12 (2010) ("the sheer topicality of computer games and virtual worlds at this particular moment in our collective history would seem to make preserving accurate and authoritative records of them an essential aspect of the mission of an institution such as the Library of Congress"). Without fair use, these collections could not be preserved or made available, and the work of software developers, designers, and engineers could not be studied alongside other important cultural products.

C. Lawful Fair Use Can Safeguard the Future of Research

Research involving digital materials (including software itself) will become increasingly difficult, if not impossible, unless a broad fair use right enables preservation and research access to software. Preservation experts warn that all "[d]igital media have a shockingly short life-span due to the natural decay of the original materials and the rapid obsolescence of older media forms, as well as the failure and obsolescence of the hardware necessary to run them." Henry Lowood, Devin Monnens, et al., *Before It's Too Late: A Digital Game Preservation White Paper*, 2 Amer. J. Play 139, 140 (2009). Examples of the research materials that could be lost or inaccessible without adequate fair use-enabled access to software include:

- historical records such as newspapers,[3]
- architectural records,[4]

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[3] David Cirella, CD-ROM Preservation: Acquisition, validation, and access by way of proprietary file formats, legacy software, and language support, https://openpreservation.org/wp-content/uploads/public/resources/opfcon/2020/Cirella_OPFCON_Poster_200609.pdf (June 9, 2020) (CD-ROM archive of Japanese newspaper *Yomiuri Shimbun* (1874-1970) used proprietary file formats inaccessible with modern software tools, and specialized viewer software required Japanese edition of Windows 98).

[4] Artefactual Systems and the Digital Preservation Coalition, Preserving CAD (2021), http://doi.org/10.7207/twgn21-15 (architectural designs "created in CAD software from the 1960s to 2000s are now extremely difficult to render because the software either no longer exists or no longer opens early versions of the format").

- photography,[5]
- video games,[6] and
- scientific research.[7]

Two detailed examples show how traditional archival processing and preservation necessitates fair use of software when digital files are involved.

Jonathan Larson, the creator of the musical *RENT*, left behind an archive stored mostly on floppy disks. Jennifer Schuessler, "Tale of the Floppy Disks:

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[5] PhotoCD, Wikipedia, https://en.wikipedia.org/wiki/Photo_CD (last visited Dec. 9, 2021) (proprietary photo digitization format in use from 1990-2004 was abandoned by the proprietor, who never released the specifications for the format, and modern reader software can facilitate "only basic, low resolution" export of images).

[6] Matthew T. Clements and Hiroshi Ohashi, Indirect Network Effects and the Product Cycle: Video Games in the U.S., 1994-2002, 53 J. Indus. Econ. 515, 528 (2005) (video game software has an average commercial life of 4 years, after which time new copies become unavailable on the primary market); Henry Lowood, Devin Monnens, et al., *Before It's Too Late: A Digital Game Preservation White Paper*, 2 Amer. J. Play 139, 140 (2009) ("Every year, thousands of games move one step closer to oblivion as a result of the same threats to longevity that affect all digital media: bit rot and obsolescence"); Jon-Paul C. Dyson, *Collecting, Preserving, and Interpreting the History of Electronic Games*, 10 Am. J. Play 1 (2017) ("even if the [video game] information is intact, the operating systems, codecs, and other pieces of software necessary to run programs of the type the game uses may be compromised and nonfunctional").

[7] Anastasia Ershova and Gerald Schneider, Software updates: the "unknown unknown" of the replication crisis, LSE Impact Blog, June 7, 2018, https://blogs.lse.ac.uk/impactofsocialsciences/2018/06/07/software-updates-the-unknown-unknown-of-the-replication-crisis/ (describing how updates to proprietary research software can change algorithms used to calculate research results, casting doubt on their reliability over time).

How Jonathan Larson Created Rent," New York Times ArtsBeat, Feb. 1, 2012, https://artsbeat.blogs.nytimes.com/2012/02/01/tale-of-the-floppy-disks-how-jonathan-larson-created-rent/. Those disks now reside at the Library of Congress, and it turns out they contained many iterations of the script for *RENT*, as well as the software Larson used to compose music, and digital files embodying personal records like letters, work schedules, and holiday party guest lists. *Id.* Unlike an analog archive, however, the information on Larson's disks could not be consulted until a professional digital archivist did substantial forensic work to recover it. To begin his research in the Larson archive, Doug Reside, the digital curator for performing arts at the New York Public Library, had to migrate the contents of the disks (including some of the software Larson used) to a more stable medium, then "hunt[] down vintage software… which allowed him to see the files exactly as Larson had seen them…." *Id.* As Reside explains, "If you're interested in the genesis of the text, it's important to see not just the earlier versions but the mechanisms by which those earlier versions were created." *Id.* Access to Larson's digital composition software, called "Performer," gave Reside insight into his creative process, including the possibility that, "If 'Rent' had been composed 10 years earlier, before such software was available, 'it might have been a radically different show.'" *Id.*

The Albert and Shirley Small Special Collections Library at the University of Virginia is a well-known destination for research on its founder Thomas Jefferson, including his architectural drawings and other records related to the buildings that form the University's historic campus, a UNESCO World Heritage site. *See* The Thomas Jefferson Papers, https://small.library.virginia.edu/collections/featured/the-thomas-jefferson-papers/ (last visited Dec. 10, 2021). Indeed, the Library holds a wide range of unique materials relating to architecture, and architectural records are among the Library's collecting priorities. *See* Special Collections: Collection Development Policy, https://www.library.virginia.edu/special-collections/collections/collection-development-policy/ (last visited December 10, 2021). One of the University's most recent architectural records acquisitions is the archive of Sheeran Architects, a firm that recently closed after operating in Charlottesville for 20 years. In stark contrast to Jefferson's papers, which have survived in their original medium for nearly two centuries and are accessible with the naked eye, the designs in the Sheeran collection were stored on digital media that is not likely to last more than a few decades, and in proprietary digital file formats that were "already incompatible or 'too old', as the error message…says, to even open in available modern viewers in 2020." Lauren Work et al., Fostering a Community of Practice at the University of Virginia Library: Final Report 3,

https://www.softwarepreservationnetwork.org/fostering-a-community-of-practice-at-the-university-of-virginia-library-final-report/ (2020). Before any collection can be added to the Library's catalog for discovery by researchers, a team of librarians processes the items it contains—creating a basic inventory and description of the items in the collection. Because modern viewer software could not render the Sheeran files, Library staff had to use the firm's original software (which was, thankfully, included in the firm's archive in the form of CD-ROM install disks) to open the records. The Library also determined that the best way to enable researchers to view the designs in the collection would be to use an emulation service that recreates the hardware on which the Sheeran design records depend, along with an operating system from the relevant era and the specific (now-obsolete) CAD software the firm used to create its designs. *Id.* at 6. Work to process the collection and enable access for research is still in progress.

For the reasons described in Part I above, fair use offers libraries, archives, and museums their best hope of lawfully preserving and providing access to digital cultural heritage. Recognizing this, the Association of Research Libraries and the Software Preservation Network facilitated the creation of the *Code of Best Practices in Fair Use for Software Preservation*. The development of fair use best practices has enabled a diverse and growing body of practitioners to exercise this important right. *See generally* Anthony Falzone & Jennifer Urban, *Demystifying*

Fair Use: The Gift of The Center For Social Media Statements Of Best Practices, 57 J. Copyright Soc'y USA 337 (2010). The *Code of Best Practices in Fair Use for Software Preservation* describes recurring scenarios encountered in cultural heritage institutions where fair use can be applied to enable responsible stewardship of software collections, based on the consensus views of librarians, archivists, curators, and other software preservation professionals. One of the scenarios where the *Code* says fair use can be applied is "providing access to software for use in research, teaching, and learning." *Id.* at 9.

CONCLUSION

For the foregoing reasons, this Court should affirm the district court's ruling that providing research access to software is a transformative purpose and that enabling non-superseding research about software is a fair use.

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CERTIFICATE OF COMPLIANCE

I hereby certify that this brief complies with the type-volume limitations of Fed. R. App. P. 32(a)(7)(B) because this brief contains 5,700 words, excluding the parts of this brief exempted by Fed. R. App. P. 32(f).

This brief complies with the typeface requirements of Fed. R. App. P. 32(a)(5) and the type style requirements of Fed. R. App. P. 32(a)(6) because this brief has been prepared in a proportionately spaced typeface using Microsoft Word in 14-point Times New Roman font.

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CERTIFICATE OF SERVICE

I hereby certify that I electronically filed the foregoing with the Clerk of Court for the United States Court of Appeals for the Eleventh Circuit by using the appellate CM/ECF system on February 16, 2022. I certify that all participants in this case are registered CM/ECF users and that service will be accomplished by the appellate CM/ECF system.

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