UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF FLORIDA
CASE NO: 9:19-cv-81160-RS

APPLE INC.,

Plaintiff,

v.

CORELLIUM, LLC,

Defendant.

_____/

DEFENDANT CORELLIUM, LLC'S MOTION FOR SUMMARY JUDGMENT AND MEMORANDUM IN SUPPORT

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Pursuant to Rule 56 of the Federal Rules of Civil Procedure and Local Rule 56.1, Defendant Corellium, LLC ("Corellium") hereby moves for Summary Judgment (the "Motion") as to and dismissal of each of Apple's claims against Corellium.

I. SUMMARY OF ARGUMENT

Corellium does not infringe any of Apple's copyrights. As an initial matter, Apple's copyrighted code is nowhere in the accused product. Corellium's virtual hardware platform contains no copyrighted iOS code at all nor was any copyrighted iOS code used in its creation. But even if Corellium or its customers used some or all of Apple's copyrighted iOS code, which they do not, Corellium is entitled to summary judgment of non-infringement because its use is categorically fair use. And to the extent Apple argues that Corellium permits its users to make unauthorized copies of iOS to virtualize, such copies would be considered intermediate and necessary for those users' research into the functional elements of iOS security, and thus, fair use.[1]

Corellium offers a security research and testing platform that enables users to load and run mobile operating systems, including Android, Linux, and iOS, on virtualized hardware. The platform, lauded by the research industry, also enables users to run third-party applications on those mobile operating systems for research, and it provides advanced tools for those same purposes. [redacted] use Corellium for highly socially-beneficial research that protects not only end users of mobile operating systems and applications but also the citizens of the United States.

Corellium's users, *i.e.* security researchers, care only about the function and ideas of portions of operating systems that they are analyzing—not the creative elements, which are only of interest to commercial consumers. Security researchers care only about *what* those operating systems do with data but **not** *how* they do it nor how pretty they look doing it. As an example, no Corellium user is interested in how the iOS calendar app looks or how well it organizes their meetings. For that, they would use a commercial smartphone or tablet. All they care about is *what*

[1] Corellium contends that it does not copy any copyrightable elements of iOS; the virtualization system deletes Apple's iOS files that it downloads within seconds and what is left is transformative new software based entirely on functional elements of Apple's iOS. However, disputed facts including the portions of code downloaded, the duration each one is kept there, and the creativity versus utilitarianism of the portions used, pose questions for the finder of fact. This is rendered moot because Corellium is entitlted to summary judgment on its fair use defense.

iOS does with a user's private data: whom that data goes to, whether outsiders can get access to the data, and whether important data can get lost or damaged.

Further, Corellium does not violate the DMCA because no technological measures exist in the allegedly infringed code. Apple makes its allegedly copyrighted code freely available online, without any technological restriction or license agreement. Anyone with a web browser can download a copy of that code, open the code file, access the contents of the file, and copy, modify, distribute, and display that file, without any technological restriction or license agreement. And even if that was not true, DMCA trafficking prohibitions do not prohibit fair use. Corellium is thus entitled to summary judgment as to all DMCA claims as well.

"[W]ith great power there must also come -- great responsibility!"[2] Apple has hundreds of millions of portable supercomputers in the pockets and homes of Americans. Many households have several of these devices, which, in addition to storing and sharing our personal data, have sensitive microphones and high definition cameras. We must ensure that our devices are secure. Software companies, including Apple, frequently make security mistakes that have enormous consequences on user privacy, and independent researchers have been instrumental in identifying these mistakes and holding Apple accountable.[3] Yet, by the filing of this lawsuit, Apple is attempting to assert complete dominance over how research into its mistakes is conducted and the timing and content of the public narrative on what is found; Apple seeks a monopoly on security research into its software and to undermine the very existence of fair use. Apple has shown that it cares more about control than security for end users. In grabbing for this power, Apple is abandoning the responsibility it has to respect the fair use of its software by security researchers.

However, the law prohibits such a misuse of copyright. Copyright law's built-in safeguards exclude functional elements and uses and limit copyright protection only to creative elements. Security research is exclusively focused on function and ideas. And the fair use doctrine is worded

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[2] Stan Lee, Steve Ditko, Jack Kirby, *Spider-man!*, AMAZING FANTASY (VOL. 1) 15, at 13 (Marvel Comics Aug. 1962), https://read.marvel.com/#/book/4746.

[3] *See e.g.* Christopher Bing, Josephf Menn, *Flaw in iPhone, iPads may have allowed hackers to steal data for years*, REUTERS, Apr. 22, 2020, https://www.reuters.com/article/us-usa-apple-cyber/flaw-in-iphone-ipads-may-have-allowed-hackers-to-steal-data-for-years-idUSKCN2242IK; William Gallagher, *China believed to have used iPhone exploits to track Uyghur Muslims*, APPLE INSIDER (Sep, 1, 2019), https://appleinsider.com/articles/19/09/01/china-believed-to-have-used-iphone-exploits-to-track-uyghur-muslims.

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unambiguously to permit the public, not Apple, to decide our level of involvement in security research for the software that runs our lives.

Apple is not harmed by the existence of Corellium's product. Corellium does not supplant the sale of Apple's iOS devices. No commercial consumer would consider Corellium a substitute for an iPhone or an iPad. Further, Apple provides its iOS code online for download by anyone, free, unencrypted, and without any access controls or agreement required. For the most part, the iOS files available online cannot be read by humans. That does not change in Corellium's system. Corellium cannot be used by people to enjoy the fruits of Apple's creativity.

Apple was aware of this technology since at least 2014 when Senior Apple executives invited Mr. Wade to give a technical demonstration. Yet, five years later, despite interactions, demonstrations, and Apple's encouragement of Corellium to continue, Apple suddenly sued Corellium—but only after a failed acquisition attempt. Apple has unduly prejudiced Corellium.

Apple's premise for this lawsuit is faulty. Software security research belongs to the public. A software's security properties are functional and are not part of the bundle of rights conferred by the existence of a copyright. The first amendment, furthermore, guarantees researchers the right to talk publicly about what they find. Even if Apple is foolhardy enough not to want their help, security researchers have a statutory right to the tools necessary to permit fair use research.

II. STATEMENT OF MATERIAL FACTS

A. CORELLIUM'S CREATION

In 2011, Chris Wade created iEmu, a product that emulated some versions of iOS. SMF[4] ¶ 25. [redacted]. In 2014, Wade developed Virtual, which went further than iEmu and allowed users to create virtualized hardware to run a modified version of iOS, similar to Corellium. *Id.* ¶¶ 26-27. [redacted] *Id.* ¶ 27. Ultimately, Citrix Systems Inc. purchased Virtual in late 2014. *Id.* ¶ 28.

In August 2017, [redacted] founded Corellium, which provides virtualized hardware that is capable of running portions of Linux, Android, or iOS operating systems. *Id.* ¶¶ 29-30. Corellium's users can choose between a cloud-based or on-premises version of the product. *Id.* ¶ 44.

[4] References to "SMF" are to Defendant Corellium, LLC's Statement of Material Facts in Support of its Motion for Summary Judgment and Incorporated Memorandum of Law, filed concurrently.

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[redacted]

B. APPLE'S iOS

iOS is an operating system distributed by Apple. *Id.* ¶ 1. It contains software ranging from low-level firmware to high-level pieces that the user perceives as the operating system. *Id.* ¶ 2. Importantly, the publicly distributed iOS code does not include certain software, [redacted]. ¶¶ 5-6, 12-13. And most parts of iOS, including the kernel[5] (or core) of the operating system are not encrypted. *Id.* ¶ 8.

[5] The kernel is the core of the operating system that has complete control over all system resources. SMF ¶ 8.

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Many parts of iOS are open source, including most of the kernel, the compiler[6] (Clang), Swift,[7] the web browser engine (WebKit),[8] and more. *Id.* ¶¶ 10-11. Other parts that Apple created exclusively are potentially subject to copyright protection. However, the copyrights asserted by Apple in this action do not cover the kernel or other core functions of iOS but instead cover tangential portions of discrete apps or programs such as, *inter alia*, Animojis, Apple TV, Apple Music, and certain improvements to a Notes app. *Id.* ¶¶ 20-22. Each copyright asserted explicitly "[e]xclude[s] . . . [p]reviously published Apple material," including prior registrations of code. *Id.* ¶ 21. In addition, iTunes versions 12.3, 12.4, 12.5.1, and 12.6 are not incorporated into iOS. *Id.* ¶ 24. Copyright registration necessarily extends only to "those component parts of the work that both are the subject matter of copyright and in which the copyright owner has the right to claim." 17 U.S.C.A. § 410(a) (1994). *See also* H.R. Rep. No. 388, 103d Cong., 1st Sess. 23 (1993).

[redacted] It does not stop anyone from downloading, inspecting, or using an IPSW file with portions of iOS in it. *Id.* ¶ 19. [redacted].

C. THE UNIQUE CORELLIUM PRODUCT

Corellium developed its hardware virtualization, including the ability to run portions of Android, Linux, and iOS, without the inclusion or use of any copyrighted Apple code. *Id.* ¶¶ 30, 41-42. It is a standalone product designed solely for security research. *Id*. ¶ 30. It is rich with features specifically built for security researchers, one of which is to permit portions of operating systems, including portions of iOS, to run. *Id*. ¶¶ 47-52.

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[6] "A compiler is a computer program that translates computer code written in one programming language (the source language) into another language (the target language)." *Compiler*, WIKIPEDIA, THE FREE ENCYCLOPEDIA (May 11, 2020), https://en.wikipedia.org/wiki/Compiler.

[7] "Swift is a powerful and intuitive programming language for macOS, iOS, watchOS, tvOS and beyond" *Swift*, APPLE.COM (May 11, 2020), https://developer.apple.com/swift/.

[8] "WebKit is the web browser engine used by Safari, Mail, App Store, and many other apps on macOS, iOS, and Linux." WEBKIT.ORG (May 11, 2020), https://webkit.org.

Significantly, Corellium does not unencrypt or in any way use any files that are encrypted by Apple in its iOS distribution. *Id.* ¶ 9. And because Corellium's product does not run on Apple hardware, the secure boot chain is simply not necessary. *Id.* ¶ 64.

D. CAUSES OF ACTION

In this action, Apple has asserted the following causes of action against Corellium.

(1) Direct Federal Copyright Infringement, under 17 U.S.C. § 501, of the Computer Programs in the Copyright Registrations identified, dated, and numbered in Exhibit A to Apple's First Amended Complaint ("FAC"), ECF No. 56, Ex. A;

(2) Direct Federal Copyright Infringement, under 17 U.S.C. § 501, of the Graphical User Interface Elements in the Copyright Registrations identified, dated, and numbered, *id.*;

(3) Contributory Federal Copyright Infringement of the Copyright Registrations identified, dated, and numbered, *id.*; and

(4) Unlawful Trafficking Under the Digital Millennium Copyright Act ("DMCA") under 17 U.S.C. § 1201(a)(2), (b), *id.* at 25.

III. ARGUMENTS AND AUTHORITIES

A. LEGAL STANDARD

1. Standard

Summary judgment is appropriate when "the pleadings . . . show that there is no genuine issue as to any material fact and that the moving party is entitled to a judgment as a matter of law." *Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 247 (1986); *HCA Health Servs. of Ga., Inc. v. Employers Health Ins. Co.*, 240 F.3d 982, 991 (11th Cir. 2001). Once the moving party demonstrates the absence of a genuine issue of material fact, the non-moving party must "come forward with 'specific facts showing that there is a genuine issue for trial.'" *Matsushita Elec. Indus. Co. v. Zenith Radio Corp.*, 475 U.S. 574, 587 (1986) (quoting Fed. R. Civ. P. 56(e)). The Court must view the record and all factual inferences therefrom in the light most favorable to the non-moving party and decide whether "'the evidence presents a sufficient disagreement to require submission to a jury or whether it is so one-sided that one party must prevail as a matter of law.'" *Allen v. Tyson Foods, Inc.*, 121 F.3d 642, 646 (11th Cir. 1997) (quoting *Anderson*, 477 U.S. at 251-52)).

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2. Copyright Infringement

To establish a claim of copyright infringement, a plaintiff must show "(1) ownership of a valid copyright, and (2) copying of constituent elements of the work that are original." *Feist Publ'ns, Inc. v. Rural Tel. Serv. Co.*, 499 U.S. 340, 361 (1991). "[O]ne who, with knowledge of the infringing activity, induces, causes or materially contributes to the infringing conduct of another, may be held liable as a 'contributory' infringer." *Sony Corp. of America v. Universal City Studios, Inc.*, 464 U.S. 417, 487 (1984) (Blackmun, J., dissenting). "[I]f a *significant* portion of the product's use is *noninfringing*, the manufacturers and sellers cannot be held contributorily liable for the product's infringing uses." *Id*. at 491, emphasis in original.

3. Fair Use

Courts developed the doctrine of fair use to put a necessary limit on copyright, which otherwise would tend "to limit, rather than expand, public knowledge." *Authors Guild v. Google, Inc.*, 804 F.3d 202, 212 (2d Cir. 2015) (citing U.S. Const., Art. I, § 8, cl. 8); *Sony*, 464 U.S. at 428-29 (Blackmun, J., dissenting). Fair use was codified in Section 107 of the Act, as follows:

> [T]he fair use of a copyrighted work . . . for purposes such as criticism, comment, news reporting, teaching (including multiple copies for classroom use), scholarship, ***or research***, is not an infringement of copyright. In determining whether the use made of a work in any particular case is a fair use the factors to be considered shall include—
>
> (1) the purpose and character of the use, including whether such use is of a commercial nature or is for nonprofit educational purposes;
>
> (2) the nature of the copyrighted work;
>
> (3) the amount and substantiality of the portion used in relation to the copyrighted work as a whole; and
>
> (4) the effect of the use upon the potential market for or value of the copyrighted work.

17 U.S.C. § 107 (emphasis added). Courts do not consider these four statutory factors in isolation. *Katz v. Google Inc.*, 802 F.3d 1178 (11th Cir. 2015). Rather, "[a]ll are to be explored, and the results weighed together, in light of the purposes of copyright." *Id*. at 1182 (quoting *Campbell v. Acuff-Rose Music, Inc.*, 510 U.S. 569, 578 (1994)). The factors are not exclusive. *Harper & Row Publishers, Inc. v. Nation Enters.*, 471 U.S. 539, 549 (1985).

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Fair use stops copyright owners from taking their copyrights so far that they harm the progress the arts and sciences. Fair use is designed to adapt to changing technology and to account for the nature of the copyrighted material. *See* H.R. Rep. No. 94-1476, at 66 (1976). As technology advances, it also changes how it affects our lives and rights, and the fair-use doctrine "must be construed in light of [its] basic purpose." *Sony*, 464 U.S. at 432 (citation omitted); H.R. Rep. No. 94-1476, at 66 (explaining that Congress did not intend "to freeze the doctrine in the statute, especially during a period of rapid technological change").

Fair use determinations may be decided on summary judgment. *Campbell*, 510 U.S. 569; *Katz*, 802 F.3d at 1184.

4. Digital Millennium Copyright Act

Section 1201(a)(2) of the Digital Millennium Copyright Act (DMCA) states that

> No person shall manufacture, import, offer to the public, provide, or otherwise traffic in any technology, product, service, device, component, or part thereof, that:
>
> (A) is primarily designed or produced for the purpose of circumventing a technological measure that effectively controls access to a **work protected under this title**;
>
> (B) has only limited commercially significant purpose or use other than to circumvent a technological measure that effectively controls access to a **work protected under this title**; or
>
> (C) is marketed by that person or another acting in concert with that person with that person's knowledge for use in circumventing a technological measure that effectively controls access to a **work protected under this title**.

17 U.S.C. § 1201(a)(2) (emphasis added); Section 1201(b) is very similar to Section 1201(a)(2). It focuses on measures protecting "a **right of a copyright owner under this title in a work** or a portion thereof." 17 U.S.C. §§ 1201(b) (emphasis added).

B. THE CORELLIUM PRODUCT CONTAINS NO APPLE CODE

The code that runs Corellium's virtualization environment contains no copyrighted Apple code at all. SMF ¶ 42. Nor did Corellium use Apple's copyrighted code to create it. *Id*. ¶ 41. Apple has not and cannot provide any evidence of direct infringement in the CP itself. Likewise, the CP does not contain Apple's graphical user interface. *Id.* ¶ 46. The CP is a standalone hardware

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virtualization solution, created by Corellium from the ground up. Id. ¶¶ 29-30, 41-42. Corellium is entitled to summary judgment that the CP does not directly infringe any of Apple's copyrights.

C. COPYRIGHT DOES NOT PROTECT THE FUNCTION OF SOFTWARE

The functional results of software are not protected by copyright. Section 101 defines a "computer program" as "a set of statements or instructions to be used directly or indirectly in a computer in order to bring about a certain result." 17 U.S.C. § 101. Section 102(b) expressly denies copyright protection "to any idea, procedure, process, system, method of operation, concept, principle, or discovery, regardless of the form in which it is described, explained, illustrated, or embodied in such work." 17 U.S.C. § 102(b). Thus, this Circuit has determined not to extend copyright protection to the operation of a computer program. "In no case [] should copyright protection be extended to functional results obtained when program instructions are executed and such results are processes of the type better left to patent and trade secret protection." *Bateman v. Mnemonics, Inc.*, 79 F.3d 1532, 1547 n.33 (11th Cir. 1996).

The functional versus creative dichotomy comes into play in the analysis of copyright infringement in two ways, copyrightability and fair use analysis. First, courts assess whether copyright protection exists at all for a given registration in a computer program. "Where the 'expression is essential to the statement of the idea,'… or where there is only one way or very few ways of expressing the idea, the idea and expression are said to have "merged." *Lexmark Int'l, Inc. v. Static Control Components, Inc*., 387 F.3d 522, 535 (6th Cir. 2004) (internal citations omitted).

Second, with respect to computer programs, the "fair use doctrine preserves public access to the ideas and functional elements embedded in copyrighted computer software programs." *Lexmark Int'l, Inc.* 387 F.3d at 537 (citing *Sony*, 203 F.3d at 603). Fair use ensures that functional uses are not accorded protection. *See Sega Enterprises Ltd. v. Accolade, Inc*., 977 F.2d 1510, 1527 (9th Cir.1992) ("the ultimate aim [of the Copyright Act] is, ...to stimulate artistic creativity for the general public good" quoting *Sony*, 464 U.S. at 432). The inquiry is thus whether the use to which the alleged infringer puts allegedly copyrighted code takes advantage of the function or enjoys the creativity.

Corellium only exists for its users to conduct research into the security of computer programs, including portions of Apple's iOS. SMF ¶¶ 30, 46-52. That is, Corellium's users are only interested in functional output of operating systems. *See, e.g., id.* As such, even to the extent

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that Apple's registered copyrights qualify for copyright protection, and it is not clear to what extent they do, Corellium's use of them must be found to be fair use, as discussed below.

D. SECURITY RESEARCH IS FUNCTIONAL AND THUS FAIR USE

1. Corellium's Usage Is Highly Transformative

The heart of the fair use inquiry is the first statutory factor, "the purpose and character of the use. . . ." 17 U.S.C. § 107(1); *Campbell*, 510 U.S. at 579; *Katz*, 802 F.3d at 1182. "The more transformative the new work, the less will be the significance of other factors, like commercialism, that may weigh against a finding of fair use." *Campbell*, 510 U.S. at 579. As an initial matter, "research" is one of the examples of fair use explicitly enumerated in section 107. 17 U.S.C. § 107; *Campbell*, 510 U.S. at 576. Thus, the purpose for which Corellium makes its tool available is inherently fair use. Furthermore, use of a copyrighted work does not have to "alter or augment the work to be transformative in nature." *A.V. ex. rel. Vanderhye v. iParadigms, LLC*, 562 F.3d 630, 639 (4th Cir. 2009). Rather, the use can be transformative in function or purpose without altering or adding to the original work. *Id*. In this Circuit, "even verbatim copying 'may be transformative so long as the copy serves a different function than the original work.'" *Cambridge Univ. Press v. Patton*, 769 F.3d 1232, 1262 (11th Cir. 2014) (quoting *Perfect 10, Inc. v. Amazon.com, Inc.*, 508 F.3d 1146, 1165 (9th Cir. 2007)). Corellium's tool, even in conjunction with portions of iOS, is transformative.

The Corellium product is a specialty security research tool. Among its many features, Corellium's product provides the ability for researchers to 1) visualize in real time the input and output processes of the operating systems running in it; 2) freeze the processes in the operating system and study a specific state for as long as they need to; 3) step backwards and forward in time at will to closely monitor system activity using CoreTrace; 4) make and test their own kernels; 5) run multiple experiments from the same starting point. SMF ¶ 48. These features are not available as part of iOS, and they "add something new, with a further purpose or different character… with new expression, meaning, or message." *Campbell*, 510 U.S. at 579. Apple acknowledged the value of Corellium's [redacted] SMF ¶ 39. *See also id.* ¶¶ 35-37. This further underscores the transformative nature of the product above and beyond what Apple already possesses

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What Corellium does not sell is anything similar to a consumer iPhone or iPad product. Even if a security researcher, for some reason, wanted to use an instance of iOS running on Corellium in a way that resembled the use of a consumer iPhone or iPad, they could not. *Id.* ¶¶ 43, 46. Corellium's virtual environment cannot be used, for example, to make calls, receive text messages, take photos, use iTunes, download apps from the App Store, navigate with GPS, or pair Bluetooth devices. *Id*. It doesn't have the processing power to play video games and, perhaps most importantly, Corellium does not sell a portable electronic device. *See id.* ¶¶ 30, 46 (the CP is a standalone product that lacks, inter alia, GPU acceleration).

The Second Circuit's decision in *Authors Guild*, 804 F.3d 202 is instructive here. In that case, Google's use of complete digital copies of the plaintiffs' books within its Google Books search engine—which allowed users to run keyword searches for books containing specific terms and view them—was found to be highly transformative use. *Id*. at 208-09. Google's search engine also included a proprietary software tool, "which ma[de] possible new forms of research, known as 'text mining' and 'data mining,'" by providing researchers with statistics relating to the frequency of usage of selected words in the aggregate body of published books throughout different historical periods. *Id*. at 209-10. The search engine provided users with snippets of relevant pages, which the court found added "important value" by allowing a researcher to skim the relevant text to evaluate whether the original work fell within the scope of his or her research interests. *Id*. Google's copying was transformative because rather than merely digitizing the original works, "***the purpose of Google's copying of the original copyrighted books [wa]s to make available significant information about those books***." *Id*. at 217 (emphasis added).

In another transformative fair use case, *Sony Computer Entertainment, Inc. v. Connectix Corp.*, 203 F.3d 596 (9th Cir. 2000), the Ninth Circuit found that a software emulator, which enabled Sony video games to be played on a personal computer, rather than on Sony's video game console, was a transformative use of Sony's BIOS operating system software. In that case, Connectix created its emulation software by copying the Sony PlayStation's operating software, its BIOS, to discover signals sent between the BIOS and the rest of the game console. *Id*. at 600. After uncovering those signals, Connectix wrote its own source code to duplicate these interfaces to create its emulator for the desktop computer, thereby enabling games written for the PlayStation console to be played on Connectix's desktop computer emulator. *Id*. The court found that

Connectix's "Virtual Game Station" was transformative because it created a new platform, i.e. a personal computer, on which consumers could play games designed for Sony's PlayStation console. *Id*. at 606. According to the Ninth Circuit, this "innovation" afforded ***added mobility*** and ***opportunity for game play in new environments***. *Id*. In addition, the court found persuasive that the Virtual Game Station "itself is a ***wholly new product***, notwithstanding the similarity of uses and functions" between it and Sony's PlayStation. *Id*. (emphasis added).

Like Connectix, Corellium has created an entirely new product through which iOS can be studied and tested in an entirely new environment. SMF ¶¶ 30, 47. Corellium has not created a clone of an Apple device; it has transformed the field of security research for mobile operating systems entirely. *Id.* ¶ 48. Corellium has invested significant resources to develop and implement a unique set of software research tools that interact with mobile operating systems for the purpose of security research. *Id.* ¶¶ 47-48, 51-52. By permitting users to run iOS with those integrated research tools, Corellium permits customers to interact with a new expression of iOS, through which Corellium users achieve entirely different purposes than the purposes for which Apple sells its iOS devices. [redacted]

This element of the fair use analysis weighs heavily in Corellium's favor.

2. Nature of the Works at Issue: Software Is Accorded Less Protection

Software is accorded less protection than literary works. "[S]ome works are closer to the core of intended copyright protection than others." *Campbell,* 510 U.S. at 586. Works that contain unprotected functional elements are accorded a "lower degree of protection than more traditional literary works." *Sega*, 977 F.2d at 1526. *See also Connectix,* 203 F.3d at 603-604. When copying both functional and expressive elements is the only way to gain access to the functional elements of a computer program for a legitimate reason, such access is fair use as a matter of law. *See Bateman*, 79 F.3d at 1539, n.18 (citing *Sega*, 977 F.2d at 1527–28).

Because iOS contains functional elements, copyright protection for it is limited. "An important distinction to be emphasized is that reverse engineering, in addition to accessing nonprotectable ideas and functional elements, may also yield access to original expression. However, while the former may be unoriginal and not worthy of copyright protection, the latter, though original and hence copyrightable, may also be denied protection where its use is found to

be "fair" under 17 U.S.C. § 107." *Id.* Apple's iOS code contains unprotected functional elements and open source code. Thus, this factor weighs in favor of Corellium as well.

3. The Use of Portions of Apple's iOS Software Package and its Graphical User Interface Are Appropriate and Necessary to Bring About Corellium's Transformative Purpose

Executing functional elements of a computer program necessary to a legitimate purpose is fair use. In *Sega*, the court held that intermediate copying was protectible as fair use if it is "necessary" to gain access to the functional elements of the software itself. *Sega,* 977 F.2d at 1518 (internal citations omitted). In *Sony*, the court extended the *Sega* court's analysis to copying of copyrighted code into emulated computer environments. *Id.* at 603–04. Where intermediate copying of both protected and unprotected elements of software is *necessary* to conduct research for a fair use purpose, it constitutes fair use. *Id*.

> Connectix presented evidence that it observed the Sony BIOS in an emulated environment to observe the functional aspects of the Sony BIOS. When this method of reverse engineering was unsuccessful, Connectix engineers disassembled discrete portions of the Sony BIOS to view directly the ideas contained therein. We conclude that intermediate copying in this manner was "necessary" within the meaning of *Sega*.

Id. at 604.

Due to the nature of security research, the portions of code that a security researcher is looking to test are by definition necessary. Security researchers use Corellium's platform to research iOS itself or the third-party apps that run on iOS. SMF ¶ 63. Importantly, such third-party apps cannot be researched without being run on iOS. Security research necessarily requires stepping methodically through the functional processes and corresponding results that may impact user privacy or come into contact with private data by running that program in the same manner that a consumer would be exposed to it. *E.g. id.* 51.No other form of expression will suffice for the results of security testing to be at all accurate. The security properties of iOS are not capable of multiple expressions in this context. One could not write their own version of a mobile operating system and purport to run security testing on iOS.

Likewise, displaying the graphical user interface is intermediate and necessary to the conduct of security research. To properly test and understand what a real-life device would do, a

researcher must from time to time interact with the interface in the virtual environment as would a regular user. *Id.* ¶ 47.

Because research is enumerated in the statute, Apple's direct and contributory infringement claims fail as a result of the fair use defense even if Apple could prove that its registrations contain copyrightable subject matter and that Corellium is using that copyrighted code.

4. Corellium Has No Adverse Effect on the Market for Apple's Products

Corellium does not compete with Apple. In determining whether an act constitutes copyright infringement or fair use, one must consider what the alleged infringer is getting from the act. The fact that Corellium makes a profit alone does not weigh against it on this factor. *Campbell*, 510 U.S. at 584 (internal citations omitted). ("If, indeed, commerciality carried presumptive force against a finding of fairness, the presumption would swallow nearly all of the illustrative uses listed in the preamble paragraph of § 107, including news reporting, comment, criticism, teaching, scholarship, and research, since these activities "are generally conducted for profit in this country.")

Thus, the question must be whether Corellium competes with Apple or otherwise harms their ability to profit from their alleged copyright. Are Corellium users purchasing the Corellium product to enjoy Apple's user interface or use the functions of the fancy applications? No. Corellium users are only interested in figuring out what issues exist in the code, what mistakes Apple or other app makers have made, not use the apps themselves. No-one is keeping their calendar, checking their emails, watching movies, storing their notes, making calls, or playing games in Corellium's expensive virtual environment. No matter what portion of iOS is running, Corellium's virtual environment cannot be used to make calls, receive text messages, take photos, use iTunes, download apps from the App Store, or navigate with GPS. SMF ¶ 46. No ordinary consumer that wants to a smartphone or a tablet will go buy from Corellium instead of Apple. Apple has adduced no evidence in discovery of such consumer use of Corellium's systems and that is because it is objectively unreasonable and does not happen.

Furthermore, Apple's iOS is not a security research tool. iOS itself is does not have any properties that make it useful to conduct security research in general. *Id.* ¶ 60. *See also id.* ¶¶ 49-50 (security researchers utilizing iPhones and iOS must rely on exploiting vulnerabilities). Corellium is the research tool and operating systems are the subject of the research.

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Apple wishes to and to obtain a monopoly over the sale of security research tools for its software but not because it sees a potential profit there. If profit was Apple's goal, they would already have such a product. Instead, Apple wants to control who can do iOS security research, what they can do with the results, and the timing and content of the public disclosure of the results. This would destroy fair use. Apple does not get to make those choices because 17 U.S.C. § 107 gives that power to the public.

E. APPLE MISUSED COPYRIGHT IN AN ATTEMPT TO GAIN A MONOPOLY ON SECURITY RESEARCH CONTRARY TO PUBLIC POLICY

Apple's position here is contrary to public policy and therefore a categorical misuse of its alleged copyright. "The doctrine of copyright misuse prohibits a copyright holder from using a copyright 'to secure an exclusive right or limited monopoly not granted by the [Copyright] Office and which it is contrary to public policy to grant.'" *Tingley Sys., Inc. v. HealthLink, Inc.*, 509 F. Supp. 2d 1209, 1219 (M.D. Fla. 2007) (quoting *Alcatel USA, Inc. v. DGI Techs., Inc.*, 166 F.3d 772, 792 (5th Cir. 1999)). Here, the inescapable, intended effect of Apple's assertion of copyright over what is clearly a fair use is as follows: Apple would have monopolistic control over security research into iOS software. Security researchers would be required to obtain a license from Apple before conducting research into iOS. Apple would love to be the fox guarding the hen house. But, by operation of law, we are entitled to dig into and learn from the devices in our stores and the software programs that are made available online. By this lawsuit, Apple has asserted that within its bundle of rights is the right to keep security researchers out of its publicly available code. Moreover, as discussed below, the twenty-two registrations asserted in this case are tangential to iOS at best and nowhere in the accused product. This a blatant power grab and a purposeful attempt to secure a monopoly to prevent independent researchers from being able to hold Apple accountable and injure its reputation. It is thus as clear a misuse of copyright as there has ever been. Corellium is entitled to summary judgment on this affirmative defense as well and to declaratory judgment that Apple misused its copyrights.

F. APPLE SHOULD BE ESTOPPED FROM ASSERTING COPYRIGHTS AGAINST CORELLIUM

"Copyright estoppel applies when the alleged infringer can show that (1) the copyright owner knew the facts of the infringement, (2) the copyright owner intended its conduct to be acted upon or the copyright owner acted such that the alleged infringer has a right to believe it was so

intended, (3) the alleged infringer is ignorant of the true facts, and (4) the alleged infringer relies on the copyright owner's conduct to his detriment." *HGI Assocs., Inc. v. Wetmore Printing Co.*, 427 F.3d 867, 875 (11th Cir. 2005) ("A copyright owner can be estopped not only by words and actions but also by silence and inaction." *Id.*)

Here, all four elements of copyright estoppel have been met. First, it is undisputed that Apple was aware of Corellium's allegedly infringing product, including that Corellium intended to sell its services by way of a subscription model, since 2017. SMF ¶¶ 31-32. Apple become further aware of the capabilities of the Corellium product during three demonstrations and months of technical due diligence. *Id.* ¶¶ 33-34. Second, Corellium had a right to believe—based on exhaustive technical due diligence, acquisition conversations, Apple's continuous encouragement of Corellium's development, and the time and energy that Apple put into negotiations—that Apple intended Corellium to continue to develop its products. *Id.* ¶¶ 33-34, 36-37. Third, Corellium was ignorant of Apple's hidden intentions. Indeed, Apple fastidiously avoided expressing to anyone at Corellium its alleged belief that the Corellium product infringes its copyrights or violates the DMCA. *Id.* ¶¶ 71-72. Fourth, Corellium relied on Apple's conduct to its own detriment. With Apple's encouragement, Corellium continued to develop its products, investing millions of dollars and years of sweat equity while Apple schemed to pull the rug out from under them. *Id.* ¶ 36.

Apple's actions and inaction speak volumes as to Apple's true intention. To pull the rug out from beneath Corellium now with millions of dollars and reputation on the line would be in opposition to fundamental principles of both law and equity. Accordingly, Corellium has relied on Apple's misrepresentations to its detriment and Apple must be estopped causing any further harm.

G. APPLE CANNOT SHOW THAT CORELLIUM INFRINGES THE SPECIFIC REGISTERED COPYRIGHTS THAT APPLE ASSERTS HERE

Apple cannot simply claim copyright in iOS in general. The Supreme Court recently affirmed the Court of Appeals for the Eleventh Circuit, holding that "a copyright claimant may commence an infringement suit, when the Copyright Office registers a copyright." *Fourth Estate Pub. Benefit Corp. v. Wall-Street.com, LLC*, 139 S. Ct. 881, 886–87 (2019). Apple identified twenty-two copyright registrations that form the basis of its infringement claims in its complaint, which included the registration number, registration date, and title of the work. FAC, ECF No. 56, Ex. A. Corellium does not infringe any of these registrations for at least three reasons.

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First, the CP does not support iOS versions earlier than 10.3—and never did. SMF ¶ 56. This quickly disposes of nine registrations: that of iOS 9.0 (TX 8-205-229), 9.1 (TX 8-205-204), and 10.0 (TX 8-344-158), as well as the registrations for Apple's iOS 9 icon compilation (VA 2-061-057) and the four registrations for wallpapers in iOS versions 7 and 8 (VA 1-922-660; VA 1-967-209; VA1-967-206; VA 1-967, 208).

Second, iTunes is not incorporated in iOS or used by the CP. SMF ¶ 24. That is why, aside from its complaint, Apple offered no evidence relating to the CP's alleged use of iTunes. Four of the registrations in suit cover iTunes, which are all irrelevant to this case.

Third, while Apple *alleged* that its iOS registrations covered the entirety of each version of iOS, they do not. FAC, ECF No. 56 at Para. 66. All of Apple's copyright registrations at issue explicitly "[e]xclude . . . [p]reviously published Apple material," including prior versions of iOS. SMF ¶ 21. Apple has not identified the "[redacted] allegedly covered by each of the registrations for iOS that it chose to assert. Apple cannot be permitted to argue to a jury that CP infringes some unidentified code. Moreover, Corellium does not support aspects (*e.g.* GPU) that are required to utilize many of the publicly touted new features of each version of iOS which may be implicated in the code covered by the remaining registrations in suit. *Id.* ¶¶ 22, 46.

Thus, summary judgment as to all of Apple's copyright infringement claims is proper.

H. CORELLIUM'S PRODUCT DOES NOT VIOLATE THE DMCA

1. No Technological Protection Mechanism Exists that Protects Access to or Rights in iOS

Corellium does not traffick in tools that circumvent any effective technological protection measures, as required by the DMCA. 17 U.S.C. § 1201 That section requires technological measures that control access to a work "protected under this title." *Id.* The protection measures that Apple alleges that Corellium circumvents do not protect access to or rights in the iOS software; they are only measures to protect the iPhone and iPad themselves from direct hacking. And though Apple does encrypt some files in the IPSW files it distributes online, those files are not unencrypted or used in any way by the Corellium virtual environment. SMF ¶ 9.

[redacted]

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[redacted]

At the moment that an IPSW file containing iOS is downloaded online, there exist no access controls whatsoever. *Id.* ¶¶ 8, 19. This file contains object code, icons, and file structures. *Id.* ¶ 5. While it is not human-readable, it does respond to functional computer input and produces output.

Accordingly, Corellium is entitled to summary judgment that no DMCA violation has occurred because no protection mechanism exists that controls access to or the rights management pertaining to Apple's allegedly copyrighted object code. This alone is dispositive of the DMCA claim under both subsections (a)(2) and (b).

2. If Apple Had an Effective Technological Protection Measure that the CP Circumvents, Substantial Fair Use Limits the DMCA Trafficking Prohibition

Even if Apple did have a technological protection measure in place that protects its alleged copyright in iOS, which it does not, and the CP permitted others to circumvent it, fair use prevents a finding of liability. Because there are substantial fair uses of the virtual hardware that Corellium provides, the DMCA trafficking provisions does not apply.

Section 1201(a)(2) prohibits trafficking in tools that circumvent protections that control access to "work protected under this title." 17 U.S.C. § 1201(a)(2). Likewise, Section 1201(b) refers to protections of a "right of a copyright owner under this title in a work . . . ." *Id.* § 1201(b). The terms "work protected under this title" and "right of a copyright owner under this title" refer to Title 17. The DMCA excludes "idea, procedure, process, system, method of operation, concept, principle, or discovery" that are carved out of the subject matter of copyright protection by section 102(b) as well as fair use under section 107. *Id.*; 17 U.S.C. §§ 102(b), 107 (1999).

Courts have applied the fair use doctrine to the DMCA. *See Lexmark*, 387 F.3d 522 (effort to use DMCA to block manufacturer of compatible printer toner cartridges rejected as conduct found to be fair use); *Online Policy Group v. Diebold, Inc.*, 337 F. Supp. 2d 1195 (N.D. Cal. 2004) (use of DMCA notices to suppress fair use led to damages being imposed on copyright owner). This makes sense; fair use is codified in Title 17, having been created out of necessity by courts in upholding Article I, Section 8, Clause 8 of the Constitution.

This is also strongly supported by the legislative history. By enacting the DMCA, Congress did not intend to create a workaround to the fair use doctrine that was created in the pre-digital age. To ensure there was no confusion with respect to what was meant by "work protected **under this title**," the act ensures that "[n]othing in this section shall affect rights, remedies, limitations, or defenses to copyright infringement, including fair use, **under this title**." 17 U.S.C. § 1201(c)(1); *see also* ***id.*** **§ 1201(c)(2). Cong**ress's intent on this point was clear: "[A]n individual would not be able to circumvent in order to gain unauthorized access to a work, **but would be able to do so in order to make fair use of a work which he or she has acquired lawfully.**" H.R. Rep. No. 105–551(I), 105th Cong., 2d Sess. ("Judiciary Comm. Rep."), at 18 (1998) (emphasis added); *see also* H.R. Rep. 105–551(II), at 38 (July 22, 1998) ("This provision is not aimed at products that are capable of commercially significant non-infringing uses, such as consumer electronics, telecommunications, or computer products [...] used by businesses and consumers for perfectly legitimate purposes."). The Senate Committee agreed, stating "[t]his paragraph does not apply to the subsequent actions of a person once he or she has obtained authorized access to a copy of a work protected under title 17 [sic], even if such actions involve circumvention of other types of technological protection measures." S. Rep. No. 105-190, at 28 (1998).

Public policy further requires courts to undertake the fair use analysis. A finding that the mere existence of technological measures necessarily prevents fair use effectively destroys the doctrine of fair use. The roadmap to block fair use entirely is as simple as erecting an "effective" barrier to copying. Every device that we bring into our homes could implement such a measure.

Several fair uses exist for the CP, including within the ambit of security research generally: (1) testing the security and privacy measures of iOS itself; (2) testing the security and privacy measures of individual third party apps; (3) testing the security and privacy measures of one's own application as it runs on a virtualized iOS operating system; (4) testing the security of the Android

operating system and apps created for Android; (5) testing the security of the Linux operating system and the applications created for Linux; (6) education related to security testing; (7) understanding previously patched vulnerabilities; (8) investigating past and current breaches; and (9) criticism of Apple for past or current security vulnerabilities. *E.g. id.* ¶¶ *49-50, 63*. Within that long list Apple only complains of one discrete potential use that Apple believes should not be considered fair: testing the security and privacy measures of iOS itself wherein the vulnerabilities discovered are not reported to Apple confidentially.

Researchers are not hackers and no hacking occurs on the Corellium platform. Outlawing the mechanism of public knowledge, education, and discourse is like faulting libraries for providing access to the knowledge that may lead to the creation of something bad, like a bomb. We value the existence of the former and have other mechanisms to combat the threat of the latter. Other laws, like the Computer Fraud and Abuse Act, are better suited to prevent the nefarious uses of the security vulnerabilities learned through fair use security research. *See* 18 U.S.C. § 1030

IV. CONCLUSION

Corellium does not infringe Apple's copyrights directly or contributorily, but even if it did Security Research into the function of iOS by Corellium's customers is a quintessential fair use. Furthermore Corellium does not traffick in software in violation of the DMCA because no technological protection measures exist here but, again, even if it did the doctrine of fair use stands mighty against Apple's attempt to take from the public its right to Security Research. Thus, this Court should enter summary judgment for all of the causes of action that Apple has brought against Corellium here and dismiss Apple's case against Corellium with prejudice.

WHEREFORE, and for the reasons set forth above, Corellium, LLC respectfully requests that this Court grant this Motion for Summary Judgment in its entirety as outlined above or, in the alternative, any portion thereof this Court deems proper and just, and grant any other relief this Court deems proper and just.

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that on this 11th day of May, 2020, a true and correct copy of the foregoing has been furnished by electronic filing with the Clerk of the court via CM/ECF, which will send notice of electronic filing to all counsel of record.

Dated: May 11, 2020 Respectfully submitted,

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