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Cracking the Code: Computer Code as Pure Speech and Its First Amendment Implications on the 3D Printed Firearms Controversy

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CRACKING THE CODE: COMPUTER CODE AS PURE SPEECH AND ITS FIRST AMENDMENT IMPLICATIONS ON THE 3D PRINTED FIREARMS CONTROVERSY

Brian E. Heckmann*

ABSTRACT

The advent of three-dimensional (3D) printing presents unprecedented challenges to the regulation of digital speech. Whereas previously, ideas constructed solely of computer code remained reliably in cyberspace, 3D printing allows for near unlimited physical realization of previously electronic concepts through relatively rapid prototyping. No controversy better exemplifies these challenges than that of 3D printed firearms. Those promoting the availability of 3D printed firearms have waged a years-long legal battle for the right to participate in the marketplace of ideas, and, at every turn, have raised First Amendment challenges to the regulations preventing them from doing so. However, even decades after the near ubiquitous adoption of the personal computer and internet, the Supreme Court still has not addressed the status of computer code under the First Amendment. This comment determines computer code's First Amendment status by viewing lower court precedent through the lens of a detailed understanding of computer science, and by providing originalist support through a historical analog. Then, this comment applies the accurate First Amendment status of computer code to address the 3D printed gun controversy.

I.	Introduction.....	366
II.	Basic Computer Science and 3D Printing Primer	369
	A. Computer Code Fundamentals.....	369
	B. 3D Printing Fundamentals	370
III.	Computer Code Should Be Considered a Medium of Pure Speech Under the First Amendment.....	372
	A. Existing Case Law Supports This Conclusion.....	372

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B.	Cryptography as a Historical Analog Used by the Founders Provides Originalist Support for the Conclusion that Computer Code Is Pure Speech	376
C.	The DefCAD Files Are Not Only Pure Speech but also Pure Speech Protected Under the First Amendment	380
IV.	Existing Federal Regulation Is Facially Neutral but Constitutionally Invalid Due to the Exercise of Boundless Discretion by the Government. Prospective State Regulation Is Likely to Be Facially Unconstitutional	382
A.	Federal Regulation Under AECA, ITAR, and USML Were Content Based As Applied Because the DDTTC Failed to Follow the Mechanisms Prescribed to Channel Its Discretion.....	385
1.	The DDTTC Abused Its Discretion by Failing to Justify Its Irregular Conduct	386
2.	The DDTTC Abused Its Discretion by Imputing a Definition to “Technical Data” That Is Both Unreasonable and Significantly Different Than the Definition Intended by Congress.....	388
B.	Prospective State Regulation in the Form of a Complete Ban Is Unconstitutional.....	390
1.	3D Printed CAD Files Are Ineligible for Categorical Exclusion From First Amendment Protection Because the States Cannot Show An Unrecognized Historical Practice of Censorship.....	391
2.	Strict Scrutiny Is Not Satisfied Because While the States’ Interest Is Compelling, a Complete Ban Is Not Narrowly Tailored	392
V.	Possible Prior Restraints Acceptable Under the First Amendment	393
VI.	Conclusion	394

I. INTRODUCTION

On May 5, 2013, Defense Distributed published on its website computer assisted design (CAD) files for “The Liberator,” a pistol intended to be made almost entirely out of plastic and produced by a 3D printer.¹ Within a matter of days, Defense Distributed received a letter from the United States Department of State demanding the removal of all CAD files for 3D printable

¹ Lee Hutchinson, *The First Entirely 3D Printed Handgun Is Here*, ARSTECHNICA (May 3, 2013, 7:00 PM), <https://arstechnica.com/gadgets/2013/05/the-first-entirely-3d-printed-handgun-is-here/>.

firearms from its website alleging noncompliance with the Arms Export Control Act (AECA) and the International Traffic in Arms Regulations (ITAR).² While Defense Distributed did comply with the State Department's demands, it also eventually filed suit in the United States District Court for the Western District of Texas alleging, among other things, that prohibiting publication of the CAD files under AECA and ITAR amounted to an unconstitutional prior restraint on Defense Distributed's freedom of speech.³

While the court did rule in the State Department's favor, future prohibition of 3D printed firearms using ITAR is uncertain. The State Department conceded that AECA and ITAR do not prohibit or prevent purely domestic electronic exchanges of the CAD files,⁴ and ITAR allows for exemptions to be made by the appropriate federal agency on a case-by-case basis.⁵ Furthermore, the Trump administration has endorsed specifically exempting firearm CAD files from the United States Munitions List (USML),⁶ a practice likely to change with every presidential transition between Democrats and Republicans.

In June of 2018, Defense Distributed settled its legal dispute with the State Department and satisfied the court's concerns regarding compliance with AECA and ITAR by restricting the dissemination of the CAD files to consumers within the United States.⁷ In response, the State Department agreed to exempt the files from the USML.⁸ However, several states and the

² Andy Greenberg, *State Department Demands Takedown of 3D-Printable Gun Files for Possible Export Control Violations*, FORBES (May 9, 2013, 2:36 PM), <https://www.forbes.com/sites/andygreenberg/2013/05/09/state-department-demands-takedown-of-3d-printable-gun-for-possible-export-control-violation/#75d73150375f>.

³ See generally *Def. Distributed v. U.S. Dep't of State*, 121 F. Supp. 3d 680 (W.D. Tex. 2015).

⁴ *Id.* at 695.

⁵ See 22 C.F.R. § 125.4 (b)(13) (2019).

⁶ First Amended Complaint for Declaratory and Injunctive Relief at 3–4, *Wash. v. U.S. Dep't of State*, No. C18-1115RSL (W.D. Wash. Aug. 2, 2018) [hereinafter *Washington Complaint*].

⁷ Admittedly, there are concerns that third parties who legally procure Defense Distributed's CAD files *could* then turn around and post them for international download on the dark web or that international consumers using VPN services could fraudulently represent themselves to Defense Distributed as domestic consumers. However, neither possibility would render Defense Distributed liable for those actions so long as Defense Distributed took all reasonable measures to ensure that access to the files was only available in the United States. *Cf.* RESTATEMENT (SECOND) OF TORTS § 448 (1965) (stating that third party criminal act is a superseding intervening cause unless the third party's criminal act is so foreseeable as to put the original party on notice).

⁸ See Christopher Carbone, *Texas Says He's Selling 3-D Printed Gun Plans, Despite Ruling*, FOX NEWS (Aug. 28, 2018), <https://www.foxnews.com/tech/texas-says-hes-selling-3-d-printed-gun-plans-despite-ruling>; Megan Flynn, *Data Allowing People to Print out Their Own Guns Temporarily Blocked from Internet in Pa. After Legal Pressure*, WASH. POST (July 30, 2018), https://www.washingtonpost.com/news/morning-mix/wp/2018/07/30/data-allowing-people-to-print-out-their-own-guns-temporarily-blocked-from-internet-in-pa-after-legal-pressure/?noredirect=on&utm_term=.e070262d2ff8.

District of Columbia sued to enjoin the State Department from enacting this settlement in an attempt to further prevent Defense Distributed from publishing its CAD files.⁹

This second attempt to prevent Defense Distributed's publication of CAD files further complicates an already unprecedented legal issue combining: (1) The uniqueness and complexity of computer code; (2) the full breadth of the First Amendment's protections; (3) no as of yet enacted legislation with which the States or Federal governments have attempted to regulate the purely domestic transfer of this type of electronic information; and (4) the emerging technology of 3D printing, which has the practical effect of blurring the already often nebulous line between speech and conduct.

Of the forty-eight page complaint filed in the Western District of Washington, twenty full pages are dedicated, not to any discussion of AECA or ITAR or the legality of allowing persons outside of the United States to download the CAD files, but to speculative¹⁰ adverse effects the availability of such files might have on the respective states' existing gun control laws.¹¹ Therefore, the apparent intent of the petitioning states is to prevent the dissemination of the CAD files with or without AECA and ITAR, and if need be by state specific legislation.

This comment aims to simplify this complex legal issue through a methodical examination of both computer code and First Amendment jurisprudence. In order to do this, the comment will be divided into four principal sections. The first will examine the technical properties of computer code and 3D printing¹²; because it is plainly obvious that no legitimate legal analysis can occur if the nature of what is being analyzed is misunderstood. The second section will take this understanding of code and compare it to legal precedent and historical evidence, to support the conclusion that computer code is pure speech rather than expressive conduct.¹³ In the third section, this comment will analyze the current federal mechanism and

⁹ Kenneth Hall, *Federal Judge Temporarily Halts Distribution of 3D Gun Blueprints*, JURIST (Aug. 1, 2018, 11:38 AM), <https://www.jurist.org/news/2018/08/federal-judge-temporarily-halts-distribution-of-3d-gun-blueprints/>.

¹⁰ As of March 16, 2019, according to Westlaw, there has not been a single case in the entire United States in either federal or state court involving violations of the Undetectable Firearms Act of 1988. Nor do the petitioning States articulate in their complaint how a 3D printed firearm in substantial compliance with the Act (and other federal firearms regulations such as the National Firearms Act of 1934) would harm the States' interest in maintaining public safety. The complaint relies on a mere formulaic recitation of existing firearms laws in each state and a conclusory assertion that the publication of the CAD files will undermine those laws unsupported by any reference to actual incidents where the laws have been undermined.

¹¹ Washington Complaint, *supra* note 6, at 21–41.

¹² See *infra* Section II.

¹³ See *infra* Section III.

prospective state mechanisms used to prevent publication of the CAD files to highlight the regulations' noncompliance with the demands of the First Amendment.¹⁴ Lastly, the final section will discuss possible regulatory measures that could pass constitutional muster.¹⁵

II. BASIC COMPUTER SCIENCE AND 3D PRINTING PRIMER

In order to intelligently examine the First Amendment properties of 3D printing, it is pertinent to provide a primer on the technological realities of computer code and 3D printing.

A. Computer Code Fundamentals

At a 50,000-foot perspective, computer code can generally be broken down into two distinct types of code: (1) the object code; and (2) the source code.¹⁶ The object code is what directs the computer to engage in a certain activity.¹⁷ Specifically, the object code instructs the computer to process electrical currents in a way that achieves the outcome desired by the user's input.¹⁸ What appears to the user on the screen is the end result of this process. Object code operates on the most fundamental level of computer function, dealing with the basic unit of a binary digit.¹⁹ Whenever a movie, a tv show, or any sort of popular media portrays a dramatic "hacking" attempt and the audience typically sees a large series of numbers (usually 1s or 0s), the real life analog to what is being shown is the object code operating at the binary digit level.²⁰

Object code is the least abstract and most arduous version of computer code for humans to understand or use.²¹ However, it is critically important to note that it is still *possible* for humans to understand object code.²² Since it is difficult and time consuming to construct complex operations directly from

¹⁴ See *infra* Section IV.

¹⁵ See *infra* Section V.

¹⁶ HARRY HENDERSON, *Compiler*, in THE ENCYCLOPEDIA OF COMPUTER SCIENCE AND TECHNOLOGY 95, 95–97 (2009).

¹⁷ *Id.*; HARRY HENDERSON, *Bits and Bytes*, in THE ENCYCLOPEDIA OF COMPUTER SCIENCE AND TECHNOLOGY 50, 50–51 (2009).

¹⁸ HENDERSON, *supra* note 16, at 95–97; HENDERSON, *supra* note 17, at 50–51.

¹⁹ *Id.*

²⁰ HENDERSON, *supra* note 17, at 50–51.

²¹ HARRY HENDERSON, *Programming Languages*, in THE ENCYCLOPEDIA OF COMPUTER SCIENCE AND TECHNOLOGY 388, 388–89 (2009).

²² *Id.*

object code, computer scientists will optimize the creation of new functions through the use of a programming language.²³ This optimized version of code is known as source code.²⁴ How the source code is actually written depends on the language it is written in. For example, construction of source code follows different rules if coding in C, compared to C++, or Java.²⁵ Yet despite the different rules of construction, these programming languages can be used to program the same functions. The choice of which programming language is used is largely determined by the preference of the programmer and his familiarity with the language.

In essence, different programming languages and their rules of construction are directly analogous to various spoken languages and their respectively different grammar. For example, if you wanted to say, “The First Amendment generally prohibits prior restraints, except for those which could pass strict scrutiny,” the construction of the sentence (placement of the subject, direct object, verb, etc.) would undoubtedly vary significantly between, for example, German and Italian. However, the fundamental concept expressed by sentence would be the same regardless of the difference in language. So, too, with programming languages, where the means of *how* the programmer tells the computer what he wants to happen will vary but *what idea* is conveyed will be the same regardless of the programming language the function has been coded in.²⁶

In order to bridge the gap between highly abstract source code and the least abstract object code, computers use a process known as compilation.²⁷ The source code is run through the compiler, the compiler interprets the directives desired by the source code and outputs those directives in object code for the machine to act on.²⁸

B. 3D Printing Fundamentals

The 3D printing process follows the same general procedure regardless of the particular software or hardware that is being used by the printer.²⁹ First, a 3D model is created using a CAD program.³⁰ A CAD program allows for

²³ *Id.*

²⁴ *Id.*

²⁵ *Id.*

²⁶ *See infra* Part III(A).

²⁷ HENDERSON, *supra* note 16, at 95–96.

²⁸ *Id.*

²⁹ *See generally* RAFIQ NOORANI, 3D PRINTING: TECHNOLOGY, APPLICATIONS, AND SELECTION 31, 31–52 (2017).

³⁰ *Id.* at 34–36.

the electronic design of blueprints that previously would have been drawn by hand.³¹ Second, that CAD file is converted into a Stereolithography (STL) file.³² This conversion essentially takes the 3D object in the CAD file and interprets it as a series of coordinates along the X, Y, and Z axes.³³ When combined, the coordinates “describe a connected set of triangles to approximate the surface of an object.”³⁴ This conversion is usually accomplished through the CAD program’s interface before allowing the STL file to be exported for use in a different program.³⁵

Third, the STL file is then processed through a slicing program that takes the object and slices it into hundreds of two-dimensional cross-sectioned layers.³⁶ Slicing programs are usually proprietary to each 3D printer manufacturer, but all manufacturers still use this slicing process.³⁷ The slicing process is the last opportunity for the user to modify any aspects of the printed object.³⁸ While the slicing program will not allow the user to completely change the design of an object—to do so would require starting over again at the CAD stage—the user can dictate options such as, “layer thickness, quality of print, extrusion temperature, material, in fill percentage, or the option to add support material or print rafts.”³⁹

Fourth, the printer runs and creates the object by layering hot filament onto the build platform in the shape of a cross-section.⁴⁰ Then, once it has finished one layer, the build platform is moved slightly down, and the process begins again with the next cross-section layer.⁴¹ Fifth, and lastly, the object is “postprocessed” meaning that after the printing is complete the object is examined for defects, any extra material is removed, and the object is cleaned.⁴² The code of the original CAD-designed object is thus involved throughout the entire process, albeit in three different iterations.⁴³ The only part of the process where code may not be involved is the post processing

³¹ HARRY HENDERSON, *Computer-Aided Design and Manufacturing*, in THE ENCYCLOPEDIA OF COMPUTER SCIENCE AND TECHNOLOGY 98, 98–99 (2009).

³² NOORANI, *supra* note 29, at 36–39.

³³ *Id.* at 36–37.

³⁴ *Id.*

³⁵ *Id.* at 37.

³⁶ *Id.* at 39–40.

³⁷ *Id.*

³⁸ *Id.*

³⁹ *Id.*

⁴⁰ *Id.* at 40.

⁴¹ *Id.*

⁴² *Id.* at 40–42.

⁴³ *See generally id.* at 31–52.

stage, but only if the postprocessing is done by hand or without the aid of computers.

III. COMPUTER CODE SHOULD BE CONSIDERED A MEDIUM OF PURE SPEECH UNDER THE FIRST AMENDMENT

Unfortunately, the Supreme Court of the United States has never addressed the issue of computer code's status under the First Amendment (apart from its status under copyright and trademark law). There are three possible interpretations on the issue: first, that computer code constitutes pure speech comparable to traditional language; second, that computer code is expressive conduct with non-speech elements; and third, that computer code is conduct with no communicative qualities as speech and thus exists outside of the protections of the First Amendment.⁴⁴ Without a clear statement of interpretation from the Court, various lower courts have endorsed differing interpretations.⁴⁵ However, as will be discussed, the conclusion that computer code is pure speech comparable to traditional languages more accurately reflects the realities of how computer code operates. Furthermore, this interpretation receives such considerable originalist support that it should prevail over all other interpretations.⁴⁶

A. Existing Case Law Supports This Conclusion

Two of the most comprehensive cases to discuss the First Amendment status of computer code are *Universal City Studios, Inc. v. Corley* and *Bernstein v. United States Department of State*.⁴⁷ In *Corley*, Mr. Corley developed decryption software that could be used to remove the anti-piracy encryption protecting copyrighted movies distributed on DVDs.⁴⁸ While the court ruled that computer code is protected as pure speech under the First Amendment,⁴⁹ it then created a false distinction between computer code and

⁴⁴ John P. Collins, Jr., Note, *Speaking in Code*, 106 YALE L.J. 2691, 2691–92 (1997).

⁴⁵ Compare *Universal Studios, Inc. v. Corley*, 273 F.3d 429, 451 (2d Cir. 2001), with *Bernstein v. U.S. Dep't of State*, 922 F. Supp. 1426, 1435–37 (N.D. Cal. 1996); see also Mark C. Bennett, *Was I Speaking to You?: Purely Functional Source Code As Noncovered Speech*, 92 N.Y.U.L. REV. 1494, 1504–06 (2017).

⁴⁶ See *infra* Part III(B).

⁴⁷ See generally *Corley*, 273 F.3d 429; *Bernstein*, 922 F. Supp. 1426.

⁴⁸ See *Corley*, 273 F.3d at 436–40.

⁴⁹ “If someone chose to write a novel entirely in computer object code by using strings of 1’s and 0’s for each letter of each word, the resulting work would be no different for constitutional purposes than if it had been written in English.” *Id.* at 445–46.

certain computer programs.⁵⁰ The court insinuated that the execution of computer code, “without the intercession of the mind or the will,” of the user would not be protected under the First Amendment.⁵¹

This distinction is logically suspect. It would allow the government to censor otherwise protected speech, so long as it could be proven that the audience to whom the speech was directed did not understand the speech or ignored it.⁵² A rule like this would result in chaos, as any First Amendment decision regarding computer code or technology would be predicated upon the relative technological acumen of each individual plaintiff. Something as important as the fundamental right of a speaker to publish his wares in the marketplace of ideas⁵³ depends no more on the ability of his audience to fully appreciate the nuances of every concept discussed than it would depend on the government’s approval.⁵⁴

The *Bernstein* court endorsed a much more accurate (and unlike *Corley*, logical) view of computer code’s status under the First Amendment. Dr. Bernstein, then a Ph.D. candidate at UC Berkley studying applied mathematics, created an encryption and decryption program using the programming language C.⁵⁵ The encryption program was called, “Snuffle.c” and the decryption program was called, “Unsnuffle.c.”⁵⁶ Dr. Bernstein wanted to publish his dissertation as well as Snuffle.c and Unsnuffle.c, to be

⁵⁰ See *id.* at 445–52.

⁵¹ See *id.* at 448–49.

⁵² By hinging its First Amendment analysis on the audience’s reaction (or lack of reaction) to the speaker, the *Corley* court ignored significant Supreme Court jurisprudence to the contrary. *Cf.* *Boos v. Barry*, 485 U.S. 312, 321 (1988) (noting that the emotive impact of speech on an audience is not a secondary effect and therefore largely irrelevant to the First Amendment analysis); *NAACP v. Claiborne Hardware Co.*, 458 U.S. 886, 927–29 (1982) (reaffirming an exacting standard to censor speech based on the audience’s possible incitement to violent and lawless action rather than a lower standard based on mere speculation of potential wrongful conduct by the audience). Additionally, future cases would reaffirm the insignificance of audience reaction. *Cf.* *Snyder v. Phelps*, 562 U.S. 443, 460–61 (2011) (stating that the emotional or physical pain effected upon the audience as a result of the speaker’s offensive speech insufficient to abridge the First Amendment rights of the speaker).

⁵³ See *Whitney v. California*, 274 U.S. 357, 375–76 (1927) (Brandeis, J. concurring); *Abrams v. United States*, 250 U.S. 616, 630–31 (1919) (Holmes, J., dissenting).

⁵⁴ Consider, for example, a video on Youtube.com of a law professor discussing Justice Jackson’s famously profound opinion in *West Virginia State Board of Education v. Barnette*, 319 U.S. 624 (1943). The audio and video displayed could be identical to what a student in class would see and hear. But unless the YouTube viewer could explain to a court how exactly the audio and video were replicated through his computer or articulate some “intercession of the mind or will” that occurred after initially clicking to play the video, then, under the *Corley* court’s logic, the government would be justified in preventing that viewer’s access to the speech even if they would not be justified in preventing access to an experienced software engineer or a law student present when the video was made.

⁵⁵ *Bernstein v. U.S. Dep’t of State*, 922 F. Supp. 1426, 1428–29 (N.D. Cal. 1996).

⁵⁶ *Id.* at 1429.

able to teach students the algorithm he used to create the programs and to present the code at academic conferences.⁵⁷

However, the AECA allows the President (and the Secretary of State, using the authority delegated to him through ITAR) to add certain items to the USML and prohibit their export or import without a license.⁵⁸ Under section 121.1, Category XIII of the USML items known as, “Auxiliary Military Equipment,” includes encryption software absent clearly defined exclusions.⁵⁹ Dr. Bernstein (much like Defense Distributed twenty-one years later) found himself at odds with the State Department, which insisted that both Snuffle.c and Unsnuffle.c required a license under the AECA prior to publication. Dr. Bernstein filed suit against the State Department alleging, among other things, that AECA and ITAR were unconstitutional as content based prior restraints on his speech both facially and as applied.

Dr. Bernstein advocated that his code should be protected as pure speech, while the federal government argued that computer code did not constitute speech but was instead pure conduct that lacked sufficient elements of communication to be protected by the First Amendment under the *Spence-Hurley* test.⁶⁰ The court strongly rejected the State Department’s argument as misguided, dubious, and lacking any support in First Amendment jurisprudence.⁶¹ The court reasoned that *Spence-Hurley*, “inquired into the communicative nature of conduct *only* after concluding that the act at issue was indeed conduct and not speech,” and that the cases strongly implied such analysis was unnecessary for “the spoken or written word.”⁶² While the court recognized the code was “functional writing,”⁶³ it was so dissimilar to the non-verbal expressive conduct in the *Spence* progeny of cases that it would be “convoluted indeed to characterize Snuffle as conduct in order to

⁵⁷ *Id.* at 1430.

⁵⁸ *See id.* at 1429; *see also* 22 U.S.C. § 2778 (2014); 22 C.F.R. §§ 120–30 (2014).

⁵⁹ *See Bernstein*, 922 F. Supp. at 1429; *see also* 22 C.F.R. § 121.1 (2018).

⁶⁰ *See id.* at 1434; *see also* *Spence v. Washington*, 418 U.S. 405, 409 (1974).

⁶¹ *Bernstein*, 922 F. Supp. at 1434–36.

⁶² *Id.* at 1434 (emphasis added).

⁶³ Whether source code and object code are functional is immaterial to the analysis at this stage. Contrary to defendants’ suggestion, the functionality of a language does not make it any less like speech . . . Thus, even if [computer code] . . . is essentially functional, that does not remove it from the realm of speech. Instructions, do-it-yourself manuals, recipes, even technical information . . . are often purely functional; they are also speech. Music, for example, is speech protected under the First Amendment. The music inscribed in code on the roll of a player piano is no less protected for being wholly functional. Like source code converted to object code, it ‘communicates’ to and directs the instrument itself, rather than the musician, to produce the music. That does not mean it is not speech. Like music and mathematical equations, computer language is just that, language, and it communicates information either to a computer or to those who can read it.

Id. at 1435.

determine how expressive it is when, at least formally, it appears to be speech.”⁶⁴

It was clear to the *Bernstein* court, and should be clear to any practitioner of the law, that computer code is the written word.⁶⁵ It may be written using a keyboard rather than a pen, or in C++ instead of English, but the *Bernstein* court correctly found these differences to be irrelevant.⁶⁶ To support its conclusions, the *Bernstein* court cited the Ninth Circuit in holding:

Of course, speech in any language consists of the “expressive conduct” of vibrating one’s vocal chords, moving one’s mouth and thereby making sounds, or of putting pen to paper, *or hand to keyboard*. Yet the fact that such “conduct” is shaped by language—that is, a sophisticated and complex system of understood meanings—is what makes it speech. Language is by definition speech, and the regulation of any language is the regulation of speech.⁶⁷

The court further held that no particular language changes the nature of languages as a general concept under the First Amendment.⁶⁸ For the purposes of the First Amendment, the court ruled that there is no meaningful difference between the abstract programming languages of source code (C++, Java, etc.), the relatively non-abstract object code, and traditional spoken languages such as English and Italian.⁶⁹ “All participate in a complex system of understood meanings within specific communities.”⁷⁰ Furthermore, once it had ruled that computer code and the languages that it operates in are definitively speech, the *Bernstein* court held that the functionality of such speech is immaterial.⁷¹ Even if the communication of ideas in a language was essentially functional, it does not change the quality of what is said in the language to something other than speech.⁷²

It is easy to see why *Bernstein* provides a more desirable holding for the Supreme Court to adopt should it take on the issue of computer code’s status

⁶⁴ *Id.*

⁶⁵ *Id.* at 1434–35.

⁶⁶ *See id.* at 1435.

⁶⁷ *Id.* (quoting *Yniguez v. Arizonans for Official English*, 69 F.3d 920, 934 (9th Cir. 1995), *vacated as moot sub nom.* *Arizonans for Official English v. Arizona*, 520 U.S. 43 (1997)) (emphasis added).

⁶⁸ *Bernstein*, 922 F. Supp. at 1435.

⁶⁹ *Id.*

⁷⁰ *Id.*

⁷¹ *Id.* at 1435–37.

⁷² *Id.*

under the First Amendment. *Corley*'s fundamental misunderstanding of computer science provides good reason to be hesitant to endorse the opinion.⁷³ Even more damning to the *Corley* court's credibility is the fact that their opinion results in an illogical and unworkable analysis. *Corley* implies that it would consider code as analogous to traditional languages just as *Bernstein* would.⁷⁴ Yet, it contradicts itself and would apply a different analytical framework to the same speech from different perspectives.⁷⁵ If traditional languages were protected under the First Amendment in the manner adopted by *Corley*, it would result in absurd and chaotically different rulings antithetical to the purpose of the Amendment.⁷⁶ By comparison, *Bernstein* is completely logical in its reasoning and provides consistent results regardless of the technological acumen of the audience.

*B. Cryptography as a Historical Analog Used by the Founders
Provides Originalist Support for the Conclusion that Computer
Code Is Pure Speech*

While the *Bernstein* court's sound logic provides ample support for considering computer code as pure speech, there is still a certain difficulty in reconciling a twenty-first century practice with the eighteenth-century concept of freedom of speech as understood by the founders and codified in the First Amendment. The Court has, in the past, addressed the First Amendment status of technology foreign to the founding generation based on its utility as a means for the conveyance of ideas.⁷⁷ Yet, in the case of computer code, there is a very strong and persuasively analogous medium well-known to and used by the founders. One which they undoubtedly considered protected under the First Amendment: cryptography.

Cryptography in the age before computers involved encoding written documents using cyphers to prevent the documents from being understood

⁷³ See *supra* notes 47–54.

⁷⁴ See *Universal Studios, Inc. v. Corley*, 273 F.3d 429, 445–46 (2d Cir. 2001).

⁷⁵ *Id.* at 447–48.

⁷⁶ See *supra* note 54.

⁷⁷ *Joseph Burstyn, Inc. v. Wilson*, 343 U.S. 495, 501 (1952). Furthermore, in the context of the religion clauses, the Court has predicated much of their analysis on a historical understanding of the founders' intent; specifically, the understanding of the First Amendment of Thomas Jefferson and James Madison. See also *McCreary Cty. v. ACLU*, 545 U.S. 844, 885–912 (2005) (Scalia, J., dissenting); *Van Orden v. Perry*, 545 U.S. 677, 722–35 (2005) (Stevens, J., dissenting); *Lee v. Weisman*, 505 U.S. 577, 609–31 (1992) (Souter, J., dissenting); *Wallace v. Jaffree*, 472 U.S. 38, 91–114 (1985) (Rehnquist, J., dissenting); *Everson v. Bd. of Educ.*, 330 U.S. 1, 8–16 (1947).

by anybody other than the intended recipient.⁷⁸ The ciphertext (encoded message) would be processed using a predetermined key (sometimes a word, sometimes a number to shift letters) and thus decoded into plaintext that any literate person could understand.⁷⁹ The parallels between the process of classical encryption and that of computer processing are obvious. The source code (much like the ciphertext) acts as an abstract text, easily understood by those writing it but not by the computer awaiting instruction. The compiler serves the same function as the key, allowing for the translation of the cipher text and the ability to act on its information. Last, the object code resembles plaintext, the least abstract, most direct format of the information conveyed.

Cryptography has existed nearly as long as the written word.⁸⁰ As long as there has been powerful nations engaging in espionage, diplomacy, or military campaigns, there have been heads of state seeking to encrypt their nation's dispatches.⁸¹ Famously, Julius Caesar created his own skip cypher for use in his personal correspondence.⁸² Anybody who received a classical education—such as the founding fathers—would be familiar with the history of the Caesarian cypher.

In particular, George Washington was undoubtedly familiar with the practice of cryptography as he operated as the United States' first spymaster.⁸³ Under his direction, Major Benjamin Tallmadge organized the famous Culper spy ring in New York.⁸⁴ The ring would use a code book to encrypt letters sent out of Manhattan by replacing individual words with prearranged numbers (not conceptually dissimilar to the binary digits that make up object code).⁸⁵ While Washington used the Culper code book, he also created his own ciphers to use in personal correspondence and military dispatches.⁸⁶

⁷⁸ JOHN F. MURPHY, JR., *Cryptography*, in *ENCYCLOPEDIA OF INTELLIGENCE AND COUNTERINTELLIGENCE* Vol. I, 182–83 (Rodney P. Carlisle ed., 2005).

⁷⁹ *Id.*

⁸⁰ See generally JOHN F. MURPHY, JR., *Timeline of Intelligence*, in *ENCYCLOPEDIA OF INTELLIGENCE AND COUNTERINTELLIGENCE* Vol. I, xv–xvi (Rodney P. Carlisle ed., 2005).

⁸¹ See generally *id.*

⁸² Suetonius, *The Life of Julius Caesar*, in *THE LIVES OF THE CAESARS*, 54 (Catharine Edwards, trans., Oxford Univ. Press) (2000).

⁸³ See generally Edward G. Lengel, *George Washington: Spymaster in Chief*, *MILITARY HISTORY* (July 2009), <https://www.historynet.com/george-washington-spy-master-chief.htm>.

⁸⁴ See *id.*; *The Culper Code Book*, MOUNT VERNON, <https://www.mountvernon.org/george-washington/the-revolutionary-war/spying-and-espionage/the-culper-code-book/>.

⁸⁵ *The Culper Code Book*, *supra* note 84; see also *supra* Section II(A).

⁸⁶ See Lengel, *supra* note 83.

Although modern legal orthodoxy holds that freedom of speech is not absolute⁸⁷—therefore, strongly implying the founding fathers did not intend it as absolute either—the protection of encoded messages and ciphers can easily be presumed from the content of the message and context in which the founders used them. This presumption survives even in the absence of an express statement of such protection. The best evidence for this is the letters between Thomas Jefferson and James Madison.⁸⁸

Jefferson first sent Madison a cypher to use for their communications in May 1785, while the former was serving as the second United States Ambassador to France.⁸⁹ Jefferson and Madison did not usually encode the entirety of their correspondence, only those parts which they deemed pertinent to keep secret in case of interception.⁹⁰ While some small parts of the letters were purely personal, most of the content was dedicated to matters of such social or political importance to the United States as to warrant First Amendment protection.⁹¹ For example, the writer would begin to talk about Great Britain's antagonistic approach to trade after the Treaty of Paris.⁹² Then the letter would shift to encoded text, without breaking the grammar or syntax of the sentence, when the writer sought to provide his own personal insight

⁸⁷ “[I]t is well understood that the right of free speech is not absolute at all times and under all circumstances. There are certain well-defined and narrowly limited classes of speech, the prevention and punishment of which have never been thought to raise any Constitutional problem.” *Chaplinsky v. State of N.H.*, 315 U.S. 568, 571–72 (1942). A comprehensive list of the speech the Court holds categorically unprotected by the First Amendment is given by Justice Kennedy in the Court's opinion of *United States v. Alvarez*, 567 U.S. 709, 716–18 (2012). *See also* *Reed v. Town of Gilbert*, 135 S. Ct. 2218, 2226 (2015) (“Content-based laws—those that target speech based on its communicative content—are presumptively unconstitutional and may be justified only if the government proves that they are narrowly tailored to serve compelling state interests.”).

⁸⁸ *See generally* Letters Between James Madison and Thomas Jefferson (1780–1826) (on file with the National Archives) *available at* <https://founders.archives.gov/?q=Correspondent%3A%22Jefferson%2C%20Thomas%22%20Correspondent%3A%22Madison%2C%20James%22&s=1111211111&r=251>.

⁸⁹ Letter from Thomas Jefferson to James Madison (May 11, 1785) (on file with the National Archives) *available at* <https://founders.archives.gov/documents/Madison/01-08-02-0150>.

⁹⁰ *E.g.*, Letter from James Madison to Thomas Jefferson (Aug. 23, 1788) (on file with the National Archives) *available at* <https://founders.archives.gov/?q=Correspondent%3A%22Jefferson%2C%20Thomas%22%20Correspondent%3A%22Madison%2C%20James%22&s=1111311111&r=253>.

⁹¹ *Id.*; *see also* *New York v. Ferber*, 458 U.S. 747, 755 (1982) (discussing at length that part of the rationale behind categorical exclusion of certain speech was because that speech had little to no, “literary, artistic, political, or scientific value”).

⁹² Letter from James Madison to Thomas Jefferson (Aug. 20, 1785) (on file with the National Archives) *available at* <https://founders.archives.gov/?q=Correspondent%3A%22Jefferson%2C%20Thomas%22%20Correspondent%3A%22Madison%2C%20James%22&s=1111311111&r=155>.

or perspective, such as when Madison speculated that Great Britain's purpose in disrupting trade was an attempt to fracture the young union of states.⁹³

The content of the encoded text varied from international intrigue regarding the United States' diplomatic interests,⁹⁴ to domestic partisan schemes within Congress and the several states,⁹⁵ to even personal matters and revelations such as Madison confiding in Jefferson that he, John Jay, and Alexander Hamilton wrote the Federalist Papers under the pseudonym of Publius.⁹⁶ Yet, for how varied the subject matter was, one characteristic was constant: the encoded text was always of a nature that has been unquestionably held protected under the First Amendment.⁹⁷

None of the encoded text engaged in any of the "certain well-defined and narrowly limited classes of speech, the prevention and punishment of which have never been thought to raise any Constitutional problem."⁹⁸ The words encoded were not lewd or obscene,⁹⁹ libelous,¹⁰⁰ or profane.¹⁰¹ The words were not used to commission a crime.¹⁰² Instead, they were the medium through which two of the most significant legal minds in early American history participated in the *diffusion of ideas*, which is the very purpose¹⁰³ of the First Amendment's protections.

Perhaps the biggest motivation in adopting the free expression clause of the First Amendment was to preserve the free and open expression of ideas from the arbitrary censorship of a sovereign ideologically opposed to what

⁹³ *Id.*

⁹⁴ Letter from James Madison to Thomas Jefferson (Aug. 23, 1788) (on file with the National Archives) *available at* <https://founders.archives.gov/?q=Correspondent%3A%22Jefferson%2C%20Thomas%22%20Correspondent%3A%22Madison%2C%20James%22&s=1111311111&r=254>.

⁹⁵ Letter from James Madison to Thomas Jefferson (Oct. 17, 1788) (on file with the National Archives) *available at* <https://founders.archives.gov/?q=Correspondent%3A%22Jefferson%2C%20Thomas%22%20Correspondent%3A%22Madison%2C%20James%22&s=1111311111&r=259>.

⁹⁶ Letter from James Madison to Thomas Jefferson (Aug. 10, 1788) (on file with the National Archives) *available at* <https://founders.archives.gov/documents/Madison/01-11-02-0159>.

⁹⁷ *Cf.* Chaplinsky v. New Hampshire, 315 U.S. 568, 571–72 (1942) (Where none of the categories the Court counted as categorically excluded would apply to the letters in question.).

⁹⁸ *See id.*

⁹⁹ *Miller v. California*, 413 U.S. 15, 24 (1973).

¹⁰⁰ *See generally* *N.Y. Times Co. v. Sullivan*, 376 U.S. 254 (1964).

¹⁰¹ *See generally* *Cohen v. California*, 403 U.S. 15 (1971).

¹⁰² "But it has never been deemed an abridgement of freedom of speech or press to make a course of conduct illegal merely because the conduct was in part initiated, evidenced, or carried out by means of language, either spoken, written, or printed." *Giboney v. Empire Storage & Ice Co.*, 336 U.S. 490, 502 (1949).

¹⁰³ *See* *Whitney v. California*, 274 U.S. 357, 375–76 (1927) (Brandeis, J., concurring); *Abrams v. United States*, 250 U.S. 616, 630–31 (1919) (Holmes, J., dissenting).

was being said.¹⁰⁴ To consider the plain text of Madison and Jefferson's correspondence as being protected from governmental censorship of the ideas expressed, but to also consider the same ideas further expressed in encoded text as unprotected is a completely arbitrary, illogical, and unworkable conclusion. The only logical conclusion is that the properties of speech under the First Amendment are unaffected by the medium of conveyance, to include encryption. Furthermore, it must be understood that the cipher itself is protected as a crucial component allowing speakers to utilize their reasonably chosen medium of communication.

Last, it is worth noting that the Founders would likely consider their private correspondence protected from government interference under the Fourth Amendment.¹⁰⁵ However, without taking an unnecessary detour through another expansive and complex area of constitutional jurisprudence, it should suffice to say that the forum of the speech conveyed (personal letters) is irrelevant.¹⁰⁶ What matters is the substance of the ideas conveyed¹⁰⁷ and the mechanism used to convey them (cryptography).

C. The DefCAD Files Are Not Only Pure Speech but also Pure Speech Protected Under the First Amendment

As has been explored, the assertion that computer code is pure speech is supported by sound precedent¹⁰⁸ as well as history.¹⁰⁹ Yet, just because something is pure speech (or expressive conduct) does not mean that it will automatically receive First Amendment protection.¹¹⁰ There must be an inquiry into the message and context of the speech. For example, a picture can receive significant First Amendment protection when it depicts a politically or culturally historic event (e.g., Nick Ut's photo of a crying girl

¹⁰⁴ See *Police Dep't of Chi. v. Mosley*, 408 U.S. 92, 96 (1972); *Whitney*, 274 U.S. at 375–76 (Brandeis, J., concurring); *Abrams*, 250 U.S. at 630–31 (Holmes, J., dissenting).

¹⁰⁵ The Founders would likely have considered private letters to fall under the “papers” or “effects” language of the Fourth Amendment.

¹⁰⁶ Compare *Hague v. Comm. for Indus. Org.*, 307 U.S. 496, 515–16 (1939), with *New York v. Ferber*, 458 U.S. 747, 755 (1982) (both speech in private and in the public fora that involves issues of public importance are protected).

¹⁰⁷ See generally *Ferber*, 458 U.S. at 755 (discussing at length that part of the rationale behind categorical exclusion of certain speech was because that speech had little to no “literary, artistic, political, or scientific value”).

¹⁰⁸ See *supra* Section III(A).

¹⁰⁹ See *supra* Section III(B).

¹¹⁰ See generally *Ferber*, 458 U.S. at 747; *Cent. Hudson Gas & Elec. Corp. v. Pub. Serv. Comm'n*, 447 U.S. 557 (1980); *FCC v. Pacifica Found.*, 438 U.S. 726 (1978).

running naked after her clothes have been burned off by napalm).¹¹¹ But nobody would seriously claim that *any* protection should be given to similar pictures in other contexts (e.g., child pornography).¹¹² This begs the question: what are the CAD files in dispute actually saying?

To answer simply, “guns” and to label the files as purely commercial speech with little to no constitutional protection is foolish and misguided. However, so is imputing to the files Defense Distributed’s advocacy for greater access to and ability to exercise the individual constitutional right to bear arms.¹¹³ The end result, the printed guns, are commodities. The CAD files are information that conveys the *idea* of that commodity yet to be realized. Does that idea hold any literary, artistic, political, educational, or scientific value?¹¹⁴ The objective, non-partisan answer is yes: these ideas have significant educational and scientific value as means for debating and experimenting with the engineering process of firearms.

CAD files are not used exclusively in additive manufacturing.¹¹⁵ They are also the basis for traditional subtractive manufacturing.¹¹⁶ Conventional gun manufacturers will still design their firearms using CAD software, and then those electronic blueprints will be used with a lathe, which creates the firearm out of a steel block. The nature of CAD files allows the designer or the engineer the ability to effortlessly experiment and attempt to optimize their product.¹¹⁷ This is the purpose and message behind Defense Distributed’s CAD files, the ability of users to interact with, manipulate, and change the files to try their own hands at engineering a firearm. As noted previously, up until the CAD file is sliced, there is still the opportunity to significantly alter it.¹¹⁸ These files facilitate the diffusion of ideas among the marketplace of ideas,¹¹⁹ albeit within the limited subsets of mechanical engineering, firearms manufacturing, and testing the tensile strength of different parts of the design.

¹¹¹ Nick Ut, THE TERROR OF WAR (1972), <http://100photos.time.com/photos/nick-ut-terror-war>.

¹¹² *Ferber*, 458 U.S. at 773.

¹¹³ “[A]dvertising which ‘links a product to a current public debate’ is not thereby entitled to the constitutional protection afforded noncommercial speech.” *Bolger v. Youngs Drug Prods. Corp.*, 463 U.S. 60, 68 (1983).

¹¹⁴ *Cf. Ferber*, 458 U.S. at 755; *Miller v. California*, 413 U.S. 15, 24 (1973) (noting where the Court used these touchstones in their analysis determining whether speech should be protected).

¹¹⁵ NOORANI, *supra* note 29, at 31–34.

¹¹⁶ *Id.*

¹¹⁷ HENDERSON, *supra* note 31, at 98–99.

¹¹⁸ *See supra* Section II(B).

¹¹⁹ *See generally* *Whitney v. California*, 274 U.S. 357, 375–76 (1927) (Brandeis, J., concurring); *Abrams v. United States*, 250 U.S. 616, 630–31 (1919) (Holmes, J., dissenting).

Furthermore, 3D printing assists the amateur gunsmiths who lack the financial resources to experiment using conventional lathes (which cost thousands of dollars)¹²⁰ and to procure the expensive raw materials used in the lathes. These CAD files and the 3D printing process provide a significantly lower barrier to entry. Amateur gunsmiths are also more likely to take risks in design than established manufacturers. Since the cost of production is relatively low, a mechanical engineer with a 3D printer could develop and test an innovative new firearm without having to worry about ruinous sunk costs. If his prototype fails catastrophically when tested, then he simply goes back to the drawing board. If his prototype works, he can patent it and begin to seek partners for large scale conventional manufacturing. By prohibiting the opportunity for limited capital inventors to use 3D printing and CAD files for experimentation, the State stunts the development of a lawful commodity. Furthermore, by restricting access to such resources the government creates a risk of censoring the speech of the disadvantaged amateur engineers who lack financial resources; which, in turn, creates concerns of favoritism and protectionism towards established manufacturers.¹²¹

**IV. EXISTING FEDERAL REGULATION IS FACIALLY NEUTRAL BUT
CONSTITUTIONALLY INVALID DUE TO THE EXERCISE OF
BOUNDLESS DISCRETION BY THE GOVERNMENT.
PROSPECTIVE STATE REGULATION IS LIKELY TO BE
FACIALLY UNCONSTITUTIONAL.**

Before directly examining the specifics of Defense Distributed's case and the State Department's use of ITAR and the USML to censor Defense Distributed, a primer on the law of prior restraints is well advised. A prior restraint is any form of regulation imposed by the government that prerequisites government approval before somebody can speak.¹²² It is also,

¹²⁰ *The CBT1640 CNC Metal Lathe*, BOLTON TOOLS, https://boltontool.com/16-x-40-cnc-metal-lathe-machine-with-six-position-toolpost-cbt1640?search=CBT1640&gclid=CjwKCAjw4LfkBRBDEiwAc2DSIE4-bIgbzPRMvj1MGpXi_Oyqkv0JJ08Kt05ueAEzlg3VBfXwULyxoC108QAvD_BwE (last visited Mar. 17, 2019).

¹²¹ *Cf. Williams-Yulee v. Fla. Bar*, 135 S. Ct. 1656, 1676 (2015) (Scalia, J., dissenting) (explaining that by banning judicial candidates from individually soliciting campaign donations, the Florida law violated the First Amendment by favoring the political speech of some candidates—the incumbent judges and wealthier candidates—over that of the challenger or less wealthy candidates).

¹²² “In its simple, most blatant form, a prior restraint is a law which requires submission of speech to an official who may grant or deny permission to utter or publish it based upon its contents.” *Alexander v. United States*, 509 U.S. 544, 566 (1993) (Kennedy, J., dissenting).

“the most serious and the least tolerable infringement on First Amendment rights . . . [it] has an immediate and irreversible sanction. If it can be said that a threat of criminal or civil sanctions after publication ‘chills’ speech, prior restraint ‘freezes’ it at least for the time.”¹²³

Any prior restraint bears a “heavy presumption against its constitutional validity.”¹²⁴ However, they are not patently unconstitutional. A content neutral prior restraint may be imposed if it is “without reference to the content of the regulated speech . . . narrowly tailored to serve a significant governmental interest, and . . . leave[s] open ample alternative channels for communication of the information.”¹²⁵ A content based prior restraint must satisfy strict scrutiny, meaning that the government must demonstrate the prior restraint serves the more demanding compelling interest standard.¹²⁶

Yet, even ostensibly content neutral restrictions on speech can be of such a quality that they are for all intents and purposes content based, and as such, the government must have a compelling reason to enact them.¹²⁷ Furthermore, while traditionally the Court has rejected the practice of determining and evaluating legislative motives,¹²⁸ more recent cases have signaled that an improper legislative intent is a relevant part of the content based analysis.¹²⁹ This shift in focus suggests that the current Court would be willing to strike down a facially neutral law under the strict scrutiny standard if they are able to elicit improper censorial motives in the enactment or enforcement of the law.

Even if a prior restraint passes the Court’s content based or content neutral analysis, it will still be held as constitutionally invalid if it conditions the speech “on obtaining a license or permit from a government official in

¹²³ *Nebraska Press Ass’n v. Stuart*, 427 U.S. 539, 559 (1976).

¹²⁴ *Org. for a Better Austin v. Keefe*, 402 U.S. 415, 419 (1971).

¹²⁵ *Clark v. Cmty. for Creative Non-Violence*, 468 U.S. 288, 293 (1984).

¹²⁶ *See Reed v. Town of Gilbert*, 135 S. Ct. 2218, 2231 (2015).

¹²⁷ “Our precedents have also recognized a separate and additional category of laws that, though facially content neutral, will be considered content-based regulations of speech: laws that cannot be ‘justified without reference to the content of the regulated speech,’ or that were adopted by the government ‘because of disagreement with the message [the speech] conveys,’ . . . Those laws, like those that are content based on their face, must also satisfy strict scrutiny.” *Id.* at 2227.

¹²⁸ “As we have said before, however, this Court will not strike down an otherwise constitutional statute on the basis of an alleged illicit motive.” *City of Erie v. Pap’s A.M.*, 529 U.S. 277, 292 (2000).

¹²⁹ “A law that is content based on its face is subject to strict scrutiny regardless of the government’s *benign motive*, content-neutral justification, or lack of ‘animus toward the ideas contained’ in the regulated speech. . . . Because strict scrutiny applies either when a law is content based on its face or when the purpose and justification for the law are content based, a court must evaluate each question before it concludes that the law is content neutral and thus subject to a lower level of scrutiny. . . . The First Amendment requires no less. *Innocent motives do not eliminate the danger of censorship presented by a facially content-based statute, as future government officials may one day wield such statutes to suppress disfavored speech.*” *Reed*, 135 S. Ct. at 2228–29 (emphasis added).

that official's boundless discretion."¹³⁰ The common sense, and perhaps well justified, reason for the Court's concern regarding boundless discretion is that it would allow an otherwise facially content neutral prior restraint to be wielded in a discriminatory manner so as to censor speakers who advocate views the government official is ideologically or politically opposed to.¹³¹ The speaker would be left with no recourse to challenge the censorship besides a lengthy and expensive legal battle,¹³² which they may well not be able to afford in either money or time.

There is a significant difference between the analyses for prior restraints on pure speech and prior restraints on expressive conduct. Prior restraints of pure speech are analyzed under the *Clark*, *Lakewood*, and *Saia* precedents as previously mentioned.¹³³ By comparison, restraints on expressive conduct are analyzed under a less rigorous standard. A prior restraint on expressive conduct is constitutional so long as the prior restraint "furthers an important or substantial governmental interest; if the governmental interest is unrelated to the suppression of free expression; and if the incidental restriction on alleged First Amendment freedoms is no greater than is essential to the furtherance of that interest."¹³⁴

The *Defense Distributed* court erroneously applied the lesser *O'Brien* standard for two reasons. First, the court found that the files are "consider[ed] . . . as *subject to the protection* of the First Amendment."¹³⁵ This language implies the court considered the CAD files as expressive conduct but not pure speech.¹³⁶ The prior sections of this comment have already discussed why that consideration was erroneous.¹³⁷ Second, the court determined that the AECA, ITAR, and USML were content neutral prior restraints.¹³⁸ That analysis was mistaken as it failed to consider how the Directorate of Defense Trade Controls (DDTC) abused its discretion by ignoring the statutorily prescribed safeguards to channel its decision-making authority; effectively

¹³⁰ *City of Lakewood v. Plain Dealer Pub. Co.*, 486 U.S. 750, 764 (1988).

¹³¹ *Cf. Reed*, 135 S. Ct. at 2228–29. *See generally* *Saia v. New York*, 334 U.S. 558, 560–61 (1948).

¹³² *See generally Saia*, 334 U.S. at 560–61.

¹³³ *See Reed*, 135 S. Ct. at 2218; *Lakewood*, 486 U.S. at 750; *Clark v. Cmty. for Creative Non-Violence*, 468 U.S. 288, 297–98 (1984); *Saia*, 334 U.S. at 558.

¹³⁴ *United States v. O'Brien*, 391 U.S. 367, 377 (1968).

¹³⁵ *Def. Distributed v. U.S. Dep't of State*, 121 F. Supp. 3d 680, 692 (W.D. Tex. 2015) (emphasis added).

¹³⁶ *Nota bene* the fact that the court describes the files as "subject to the protection of the First Amendment" and not as "speech" is significant. Such a distinction has been used to distinguish the constitutional status of expressive conduct from pure speech. *See generally* *Texas v. Johnson*, 491 U.S. 397, 405–06 (1989).

¹³⁷ *See supra* Part II and Part III.

¹³⁸ *Def. Distributed*, 121 F. Supp. 3d at 694.

making the AECA, ITAR, and USML content based prior restraints as applied.¹³⁹

A. Federal Regulation Under AECA, ITAR, and USML Were Content Based As Applied Because the DDTC Failed to Follow the Mechanisms Prescribed to Channel Its Discretion

It is obvious that the Western District of Texas erred in ruling that AECA, ITAR, and the USML acted in concert as content neutral prior restraints against Defense Distributed. This conclusion is based on two factual occurrences that went unanalyzed by the court and unexplained by the government: (1) The DDTC's sua sponte decision to rule on the CAD files¹⁴⁰ outside of the proper commodity jurisdiction proceedings; and (2) the DDTC's abuse of the "technical data" definition within ITAR to include the CAD files when such an inclusion clearly is not within the plain reading of the law. Both of these actions by the DDTC exhibit a disconcerting disregard for the statutorily prescribed rules¹⁴¹ that channel the DDTC's discretion when evaluating whether or not an item is subject to ITAR under commodity jurisdiction.

These actions raise the same concern over ideological or political abuse of boundless discretion the Court articulated in *Saia* and *Reed*.¹⁴² This concern is further compounded by reasonable inferences: (1) from the prior political actions of Kenneth B. Handelman,¹⁴³ the Deputy Assistant Secretary of State for Defense Trade Controls who managed the DDTC at the time of the determination; (2) from the failure to provide a timely determination on the commodity jurisdiction requests as required by law;¹⁴⁴ and (3) from the

¹³⁹ See *infra* Part IV(A).

¹⁴⁰ Complaint at 5, *Def. Distributed v. U.S. Dep't of State*, 121 F. Supp. 3d 680 (W.D. Tex. 2015) (No. 1:15-cv-372) [hereinafter *Def. Distributed Complaint*].

¹⁴¹ See 22 C.F.R. § 120.4 (2014).

¹⁴² See generally *Reed v. Gilbert*, 135 S. Ct. 2218, 2218 (2015); *Saia v. New York*, 334 U.S. 558, 560–61 (1948).

¹⁴³ Prior to his work at the State Department, Handelman was the Legislative Director for Senator Howard Metzenbaum (D-OH), the initial sponsor of the Brady Handgun Bill. *Kenneth B. Handelman: Former Principal Deputy Assistant Secretary of Defense for International Security Affairs*, U.S. DEP'T OF DEF., <https://dod.defense.gov/About/Biographies/Biography-View/Article/618086/kenneth-b-handelman/> (last visited Nov. 3, 2019); *President Signs 'Brady' Gun Control Law*, CQ ALMANAC 1993, 300–03 (49th ed.), <https://library.cqpress.com/cqalmanac/document.php?id=cqal93-1105725> (last visited Nov. 3, 2019); see also *Reed*, 135 S. Ct. at 2228–29.

¹⁴⁴ 22 C.F.R. § 120.4(d)(2) (2014).

Obama Administration's general advocacy for greater gun control¹⁴⁵ which is diametrically opposed to Defense Distributed's advocacy.¹⁴⁶

1. The DDTC Abused Its Discretion by Failing to Justify Its Irregular Conduct

When the State Department originally contacted Defense Distributed regarding supposed noncompliance with ITAR, Defense Distributed submitted a commodity jurisdiction request to the DDTC for a miniature lathe called "The Ghost Gunner" and the software to operate it.¹⁴⁷ Defense Distributed also submitted nine further commodity jurisdiction requests for prepublication approval of firearm CAD files.¹⁴⁸ Whenever the State Department is unsure if an item qualifies as a "defense article" under the USML, it provides the producer of the item the opportunity to request a commodity jurisdiction determination by submitting a specific form.¹⁴⁹ Each request must "identify the article or service, and include a history of this product's design, development, and use. Brochures, specifications, and any other documentation related to the article or service should be submitted as electronic attachments."¹⁵⁰

These requests are specific to each individual item.¹⁵¹ For example, when Defense Distributed was first contacted by the State Department and, in response, submitted ten different commodity jurisdiction requests to include the Ghost Gunner lathe and nine CAD files,¹⁵² the commodity jurisdiction process required the DDTC to make an individualized determination of each request.¹⁵³ However, two years after Defense

¹⁴⁵ See *US Gun Debate: Obama Unveils Gun Control Proposals*, BBC NEWS (Jan. 16, 2013), <https://www.bbc.com/news/world-us-canada-21049942>; *Party Platform: Preventing Gun Violence*, DEMOCRATIC NAT'L COMMITTEE, <https://democrats.org/where-we-stand/the-issues/preventing-gun-violence/> (last visited Mar. 17, 2019).

¹⁴⁶ Def. Distributed Complaint, *supra* note 140, at 4; *About*, DEF. DISTRIBUTED, <https://defdist.org/about/> (last visited Mar. 17, 2019).

¹⁴⁷ Def. Distributed Complaint, *supra* note 140, at 4–5.

¹⁴⁸ *Id.* at 5.

¹⁴⁹ See generally 22 C.F.R. § 120.4 (2014).

¹⁵⁰ 22 C.F.R. § 120.4(c) (2019). *Nota bene* the language of the statute is exclusively singular. The lack of plural verbiage indicates the statute requires individualized determinations, not ad hoc group determinations.

¹⁵¹ 22 C.F.R. § 120.4(c) (2019).

¹⁵² Def. Distributed Complaint, *supra* note 140, at 7.

¹⁵³ 22 C.F.R. § 120.4(d)(2) (2019).

Distributed filed commodity jurisdiction requests, the DDTC failed to provide determinations on any of the ten requests.¹⁵⁴

Defense Distributed submitted a second (and eleventh overall) request specifically regarding the Ghost Gunner lathe.¹⁵⁵ Four months after this second request for the Ghost Gunner, the DDTC provided a determination.¹⁵⁶ But the outstanding nine requests never received a determination.¹⁵⁷ While the DDTC determined the Ghost Gunner and software required to operate it were not subject to control under ITAR,¹⁵⁸ the DDTC also added on to their determination regarding the Ghost Gunner (seemingly as an ad hoc afterthought) a statement notifying Defense Distributed that its other “software, data files, project files, coding, and models for producing a defense article, to include 80% AR-15 lower receivers, are subject to the jurisdiction of the Department of State in accordance with [ITAR].”¹⁵⁹ The State Department did this despite the fact that the specific Defense Distributed requested review of those items was never answered by the DDTC.¹⁶⁰ This directly contradicts the requirement for an individualized determination set by Congress and constitutes an ultra vires abuse of the discretion provided to the DDTC under commodity jurisdiction proceedings.¹⁶¹ It also prevents Defense Distributed from understanding what characteristics or aspects of its CAD files cause the files to be subject to ITAR, thereby preventing Defense Distributed any meaningful opportunity to alter or adjust the files to bring them outside of ITAR’s scope.

These actions objectively raise the specter of politically motivated viewpoint censorship that the Court has categorically refused to countenance.¹⁶² The DDTC allowed Defense Distributed’s commodity jurisdiction requests to wallow unanswered for over two years. Yet, the DDTC proved that it was capable of taking timely action by responding to Defense Distributed’s second commodity jurisdiction request for the Ghost Gunner lathe in four months. The lathe is, by any objective measure, far more capable of manufacturing effective and durable firearms than the experimental and fragile firearms derived from 3D printing.

¹⁵⁴ Def. Distributed Complaint, *supra* note 140, at 8.

¹⁵⁵ *Id.* at 5.

¹⁵⁶ *Id.*

¹⁵⁷ *Id.*

¹⁵⁸ *Id.*

¹⁵⁹ *Id.*

¹⁶⁰ *Id.*

¹⁶¹ See 22 C.F.R. § 120.4 (2019).

¹⁶² See *Reed v. Gilbert*, 135 S. Ct. 2218, 2228–29 (2015); see also *Saia v. New York*, 334 U.S. 558, 560–61 (1948); *Hague v. Comm. for Indus. Org.*, 307 U.S. 496, 516 (1939).

Why was the DDTC willing to allow the lathe's export, the export of the software used to operate it—presumably with the knowledge that CAD files are used as part of its operation—but then refuse to allow publication of CAD files that had the stated purpose of being used in a 3D printer? This decision is nonsensical given the fact that the same CAD files could be used to operate the Ghost Gunner, even though there has been no indication that there is a demand for 3D printed firearms among the foreign enemies of the United States. Every aspect of that decision is contradictory to ITAR's stated goal of preventing trafficking in arms,¹⁶³ and the conclusion seems inescapable that the DDTC used ITAR as a mere pretext to censor political speech it did not like.¹⁶⁴ If the decision was not politically motivated, it would follow logically that the Ghost Gunner lathe should have been restricted as subject to ITAR while the CAD files should have been approved.¹⁶⁵

2. The DDTC Abused Its Discretion by Imputing a Definition to “Technical Data” That Is Both Unreasonable and Significantly Different Than the Definition Intended by Congress

The second indication that the DDTC abused its discretion and engaged in viewpoint discrimination against Defense Distributed is the expansion of the statutory definition of “technical data” beyond its natural and intended reading.¹⁶⁶ Consistently throughout litigation, the State Department asserted that the CAD files in dispute are not defense articles in the traditional sense of munitions, but rather in the sense of “technical data.”¹⁶⁷ While the court correctly noted that ITAR's definition of “technical data” is broadly

¹⁶³ As previously mentioned, the 3D printing process is effectively limited to use in prototyping new firearms. 3D printing is cheaper, but often more time consuming and results in a more fragile product. The printed guns are more novelty than weapon of war. In contrast, a metal lathe can produce conventional small arms that are much more durable and practical to use on a battlefield. It therefore seems that the DDTC's decision to allow the export of the means to create conventional arms, while denying export of the means to create novelties, is counterproductive to the stated goal of preventing arms trafficking benefiting enemies of the United States.

¹⁶⁴ This conclusion is compounded by DDTC's failure to provide reasoning for decision, meaning that there can be no judicial review of their discretionary motives. This ambiguous government motive for censorship is far removed from the openly recognized “benign motives” contemplated and expressly rejected by *Reed. Reed*, 135 S. Ct. at 2228–29.

¹⁶⁵ See *supra* note 163.

¹⁶⁶ See 22 C.F.R. § 120.10 (2019).

¹⁶⁷ See generally Defendants' Opposition to Plaintiff's Motion for a Preliminary Injunction, *Def. Distributed v. U.S. Dep't. of State*, 121 F. Supp. 3d 680 (W.D. Tex. 2015) (No. 1:15-cv-372-RP); Brief of Respondent-Appellees, *Def. Distributed v. U.S. Dep't. of State*, 838 F.3d 451 (5th Cir. 2016).

defined¹⁶⁸ to include information such as any non-software blueprints¹⁶⁹ and software directly related to defense articles,¹⁷⁰ the court clearly erred in holding that the DDTC's application of this definition was not specifically aimed to chill Defense Distributed's speech.¹⁷¹ The plain reading of the definition for "technical data" implies that technical data is comprised of two distinct groups: analog¹⁷² and software.¹⁷³ The CAD files in dispute appear not to fit into either category, being a digital form of media but not software. Software is computer code that allows for the execution of files and the resulting action to be completed by the computer.¹⁷⁴ The CAD files are what is being executed, not the software doing the execution.¹⁷⁵

Nevertheless, the State Department used the "technical data" definition to bar Defense Distributed from publishing the CAD files rather than properly adding CAD files to the USML under Category XXI¹⁷⁶ until such a time as the technical data definition could be amended or otherwise clarified by Congress. Through this action, the DDTC abused its discretion and acted beyond the scope of its authority by reading, into a term defined by Congress, a secondary definition that Congress failed to write itself.¹⁷⁷ The DDTC, a politically appointed position within the executive branch, in effect usurped the congressional prerogative to create and amend law. It further compounded this abuse of discretion by completely ignoring the statutorily provided mechanism for temporarily including a previously unconsidered item under the USML until Congress—the proper authority—could review the item and determine if it should be added to the USML.

¹⁶⁸ 22 C.F.R. § 120.10 (2019).

¹⁶⁹ 22 C.F.R. § 120.10(a)(1) (2019).

¹⁷⁰ 22 C.F.R. § 120.10(a)(4) (2019).

¹⁷¹ *Def. Distributed*, 121 F. Supp. 3d at 694.

¹⁷² See 22 C.F.R. § 120.10(a)(1)–(3) (2019).

¹⁷³ See 22 C.F.R. § 120.10(a)(4) (2019).

¹⁷⁴ See DANIEL B. GARRIE & FRANCIS M. ALLEGRA, *PLUGGED IN: GUIDEBOOK TO SOFTWARE AND THE LAW* § 2.1, at 45–46 (2013).

¹⁷⁵ See *supra* Section II(B).

¹⁷⁶ See 22 C.F.R. § 121.1 Category XXI (2019).

¹⁷⁷ "Context establishes the conditions for applying the [Negative-Implication Cannon], but where those conditions exist, the principle that specification of the one implies exclusion of the other validly describes how people express themselves and understand verbal expression." ANTONIN SCALIA & BRYAN A. GARNER, *READING LAW: THE INTERPRETATION OF LEGAL TEXTS* 107 (2012). See also *id.* at 107–11. In *Defense Distributed's* case, the critical contexts are: (1) The express distinction between analog technical data (such as blueprints) and software made in 22 C.F.R. § 120.10(a)(1); (2) The absence of executable files but enumeration of application programs in 22 C.F.R. § 120.45(f) statutory definition of "software"; and (3) The language of 22 C.F.R. § 121.1 Category XXI acting as a temporary catch all provision for articles not considered by Congress until such a time that Congress would decide to amend the USML.

It is hard to think of any possible legitimate motive for the DDTC to so blatantly abandon the explicitly defined due process. There simply is no objective justification for the DDTC to act in the way they did. At best, it may have been unbiased incompetence, but the worst-case scenario is patently unconstitutional viewpoint discrimination. These acts strongly implicate the concern of political censorship¹⁷⁸ specifically aimed¹⁷⁹ at Defense Distributed's political advocacy. At the time of the determination, the Democrats held the executive branch while the Republicans controlled both houses of Congress. If the DDTC had added the CAD files to Category XXI, it is unlikely that a gun-rights-friendly Congress would agree to include them in the USML (especially given the publicity of the 3D printed gun controversy and the upcoming 2016 election). This, obviously, was contrary to the political interests of the Obama administration and would prove problematic as Category XXI only allows for *temporary* restriction. But by disregarding procedure and congressional authority, the DDTC ensured the CAD files would not be disseminated either abroad or in the United States until there was either a successful legal challenge or a change in administration.

B. Prospective State Regulation in the Form of a Complete Ban Is Unconstitutional

At the time of the writing of this comment, no state, as of yet, has written any law regulating 3D printed firearms; and as such, this section is necessarily speculative and brief. For the time being, any state that does not wish to see Defense Distributed's CAD files published has no need to act because the injunction from the Western District of Washington makes other regulatory action unnecessarily redundant. However, should that injunction be invalidated, or the case resolved in some other manner, the states who did seek the injunction will almost certainly act to regulate 3D printed firearms in the absence of federal regulation.

While no proposals have been put forward, the tone of the complaint and political stances of the state administrations suggest that the intended

¹⁷⁸ See generally *Saia v. New York*, 334 U.S. 558, 560–61 (1948).

¹⁷⁹ This inference is strengthened by the fact that the DDTC did not purport to restrict all firearm CAD files, only those published by Defense Distributed. As previously mentioned, conventional subtractive manufacturing of firearms also uses CAD files of the components. Many manufacturers such as Glock still manufacture their products overseas. Yet, there is no indication that the DDTC prohibited the engineers working for Glock in the United States from sending their CAD designs to the factory in Austria for production. See generally *Williams-Yulee v. Fla. Bar*, 135 S. Ct. 1656, 1676 (2015) (Scalia, J., dissenting).

course of action would be a total prohibition on the files.¹⁸⁰ The states seem to be adverse to the idea of any level of public availability of the CAD files, and so it is unlikely they would implement a more limited time, place, or manner restriction.¹⁸¹ Therefore, the states would have to justify their regulation on the grounds that the CAD files are either categorically excluded from the protection of the First Amendment, or they would have to satisfy the strict scrutiny standard. Without any binding precedent specifically regarding 3D printed firearm CAD files, the lower courts would have to apply general principles of First Amendment law. Any prospective state laws resulting in a complete prohibition of the CAD files should be held invalid for the following well established doctrinal reasons.

1. 3D Printed CAD Files Are Ineligible for Categorical Exclusion From First Amendment Protection Because the States Cannot Show An Unrecognized Historical Practice of Censorship

As mentioned previously, computer code is best understood as pure speech,¹⁸² though not all pure speech falls within the protection of the First Amendment.¹⁸³ However, the Court is incredibly hesitant to recognize new classes of categorically unprotected speech.¹⁸⁴ A new class will be recognized only when the Court is, “presented with ‘persuasive evidence that a novel restriction on content is part of a long (if heretofore unrecognized) tradition of proscription.’”¹⁸⁵ Prohibiting 3D printed firearm CAD files obviously cannot pass this test. They are a novel emerging technology that did not exist even ten years ago, let alone sufficiently throughout American or English history to demonstrate a historical practice of proscription.

Furthermore, the CAD files’ closest analog from the founding era, cryptographic messages, were not categorically excluded from First Amendment protection.¹⁸⁶ As both law and history are against the states seeking total prohibition, the only means of justifying a content-based total

¹⁸⁰ Washington Complaint, *supra* note 6, at 21–41.

¹⁸¹ *Id.*

¹⁸² See *supra* Section III.

¹⁸³ See generally *United States v. Alvarez*, 567 U.S. 709, 717–18 (2012); *Chaplinsky v. New Hampshire*, 315 U.S. 568, 571–72 (1942).

¹⁸⁴ See *United States v. Stevens*, 559 U.S. 460, 470–72 (2010).

¹⁸⁵ *Alvarez*, 567 U.S. at 722 (quoting *Brown v. Entm’t Merchs. Ass’n*, 564 U.S. 786 (2011)).

¹⁸⁶ See *supra* Section III(B).

prohibition left to them would be to argue that the regulation satisfies strict scrutiny.¹⁸⁷

2. Strict Scrutiny Is Not Satisfied Because While the States' Interest Is Compelling, a Complete Ban Is Not Narrowly Tailored

The states' purported purpose for a total prohibition on the dissemination of the CAD files is rooted in public safety.¹⁸⁸ It hardly needs to be recognized that firearms are capable of harming people. Nor is it a controversial idea to say that designating individuals as "prohibited persons" and stripping them of their individual right to own a firearm can be absolutely justified based on that individual's past actions demonstrating a proclivity towards harming others.¹⁸⁹ Therefore, even in the event that the Court decides to engage in a *Reed*-like legislative motive inquiry, it is all but indisputable that the states have a legitimate and non-partisan compelling interest in protecting their citizens from prohibited individuals unlawfully acquiring firearms. The question then becomes: is the means of achieving this—through total prohibition of access to the CAD files—sufficiently narrowly tailored to serve the State's compelling interest?

"[T]he essence of narrow tailoring is that the regulation focuses on the source of the evils the [government] seeks to eliminate . . . and eliminates them without at the same time banning or significantly restricting a substantial quantity of speech that does not create the same evils."¹⁹⁰ In the context of 3D printed firearm CAD files, this means that if there is a substantial quantity of speakers prevented from using the files to convey information and ideas that do not endanger public safety, then the prospective statute is not sufficiently narrowly tailored and must fail strict scrutiny.

It is obvious that a total ban on publication, allowing no exceptions, would suppress all speakers regardless of their lawful or unlawful intended

¹⁸⁷ Several doctrines that would allow for content-based regulation under less exacting scrutiny are inapplicable in *Defense Distributed*'s case. *Defense Distributed* desires to disseminate the files free of charge; therefore, they are not proposing a commercial transaction and the commercial speech doctrine does not apply. *See City of Cincinnati v. Discovery Network, Inc.*, 507 U.S. 410, 423 (1993). *Defense Distributed* does not advocate for violent and/or unlawful use of the weapons produced from their CAD files; therefore, *Defense Distributed*'s speech does not "communicate a serious expression of an intent to commit an act of unlawful violence" that would invoke the true threat doctrine. *See also Virginia v. Black*, 538 U.S. 343, 359–60 (2003).

¹⁸⁸ *See generally* Washington Complaint, *supra* note 6, at 2.

¹⁸⁹ *See generally* 18 U.S.C. § 922(g) (2019) (detailing the criteria for prohibited persons).

¹⁹⁰ THOMAS E. BAKER ET AL., *FIRST AMENDMENT LAW* 367 (4th ed. 2018) (quoting *Ward v. Rock Against Racism*, 491 U.S. 781, 799 n.7 (1989) (internal quotation marks omitted)).

use of the CAD files. As such, not only would the ban prevent the evil the states seek to prevent—prohibited persons obtaining firearms outside of the lawful clearance process—but it would chill the speech of lawful speakers such as mechanical engineering students, licensed firearm manufacturers, or lawfully permitted amateur gunsmiths.¹⁹¹ The doctrine of narrow tailoring is not a balancing analysis;¹⁹² it does not require a showing that there are substantially *more* lawful speakers effected than unlawful speakers, just that there is a substantial number of lawful speakers who could be affected.

According to the Bureau of Alcohol, Tobacco, and Firearms, there are 68,341 individuals or companies who in 2017 were licensed to engage in gunsmithing or manufacturing.¹⁹³ This represents 85 percent of all federal firearm license holders in the United States. Even if each license holder were treated as an individual and employees working under a company's license were discounted, this number represents a substantial population of speakers by any means. This also excludes the countless number of mechanical engineering students who may use these files for purely academic purposes. With so many lawful speakers being affected by a total ban, there is no possible way that any court could hold that such a ban would be sufficiently narrowly tailored to survive strict scrutiny.

V. POSSIBLE PRIOR RESTRAINTS ACCEPTABLE UNDER THE FIRST AMENDMENT

This does not mean that there is no state (or federal) regulation that could survive strict scrutiny.¹⁹⁴ In fact, the means for doing so are relatively simple: the government needs only to avoid the defects in prior regulation attempts that violated the Constitution. For example, if Washington enacts a law categorically prohibiting the possession, transmission, or use of CAD files

¹⁹¹ See Section III(C) *supra*. It is important to note that the phrase “amateur gunsmith” is not used to connote an individual making unauthorized attempts to fabricate or modify firearms, but rather individual smiths who operate on a small (usually single brick and mortar shop) scale that do not have the same financial resources as a conventional large-scale manufacturer.

¹⁹² “In light of the substantial and expansive threats to free expression posed by content-based restrictions, this Court has rejected as ‘startling and dangerous’ a ‘free-floating test for First Amendment coverage . . . [based on] an ad hoc balancing of relative social costs and benefits.’” *United States v. Alvarez*, 567 U.S. 709, 717 (2012) (quoting *United States v. Stephens*, 559 U.S. 460, 470 (2010)).

¹⁹³ Listing of Federal Firearms Licensees, BUREAU OF ALCOHOL TOBACCO & FIREARMS (2017), <https://www.atf.gov/firearms/listing-federal-firearms-licensees-fpls-2017>.

¹⁹⁴ “We have emphasized that it is the rare case in which a State demonstrates that a speech restriction is narrowly tailored to serve a compelling interest.” *Williams-Yulee v. Fla. Bar*, 135 S. Ct. 1656, 1665–66 (2015) (internal quotation marks omitted).

for the purposes of designing or manufacturing a firearm, that law is not sufficiently narrowly tailored and violates the First Amendment. But if Washington enacts a law prohibiting the possession, transmission, or use of CAD files for the purpose of designing or manufacturing a firearm *by any person prohibited by state or federal law from obtaining firearms*, that statute would not affect the lawful speakers using the CAD files and so is sufficiently narrowly tailored.

The state could also define specifically the lawful uses of the files and provide that *only* those who have a predetermined lawful purpose are able to possess the files. For example, Washington could enact a law that required all individuals who possess, transmit, or use a CAD file to design or manufacture a firearm hold or be employed by a federal firearm license holder, or be enrolled in a mechanical engineering program at an accredited university and acting within the scope of their education. Both proposals would regulate the evil sought to be prevented by the state (acquisition of firearms by prohibited persons) without burdening or censoring a substantial population of speakers not associated with that evil.

Lastly, the state could allow the executive to authorize possession and use of the CAD files on a case by case basis. However, the state would need to avoid the constitutional defects associated with the similar federal regulatory scheme.¹⁹⁵ Any abuse of the discretion afforded to the executive decision maker would need to be swiftly redressed and diligently prevented.¹⁹⁶ To prevent any arguable abuse of discretion, the state must carefully craft the statute so the language unambiguously defines what acts and what actors are subject to regulation and specifically enumerate what factors the state actor can and cannot consider in his decision.¹⁹⁷ For example, the statute could mandate that the decision maker only consider an applicant's criminal history and prohibit consideration of their political affiliation.

VI. CONCLUSION

The controversy surrounding 3D printed firearms presents a complex legal issue because of the uncertain First Amendment status of the CAD files at heart of the controversy. With an accurate understanding of the properties of computer code and computer science,¹⁹⁸ it becomes abundantly clear that

¹⁹⁵ See *supra* Section IV(A).

¹⁹⁶ See *id.*

¹⁹⁷ See *id.*

¹⁹⁸ See *supra* Section II.

computer code is a medium of pure speech. It is a language that translates ideas in an identical fashion to traditional spoken languages, and therefore should be protected by the First Amendment in the same vein as the spoken or written word.¹⁹⁹ Sound legal precedent²⁰⁰ and historical analogs²⁰¹ from the founding era support this conclusion. By accurately considering computer code as pure speech, it is evident that the Western District of Texas erred in applying the less rigorous standard of intermediate scrutiny reserved for expressive conduct.²⁰²

It is also clear that the existing federal and prospective state regulations against the CAD files fail to satisfy the weighty standard required to allow a prior restraint on pure speech.²⁰³ Existing federal regulation is constitutionally invalid because the DDTC acted without regard to the channeling mechanisms placed on its discretion by Congress.²⁰⁴ Therefore, regardless of ITAR or the USML's *de jure* character as a content neutral or content based regulatory scheme, their *de facto* application was, as regulatory schemes, with boundless discretion that resulted in politically motivated viewpoint discrimination.²⁰⁵ The Court has categorically refused to allow such schemes to survive judicial review.²⁰⁶

Prospective state legislation in the form of a total prohibition is unconstitutional because there is no historical support for a categorical exclusion of the files from the protection of the First Amendment.²⁰⁷ Furthermore, because a total prohibition censors such a large pool of lawful speakers, it is not sufficiently narrowly tailored to survive the strict scrutiny analysis associated with evaluation of a content-based prior restraint.²⁰⁸

The federal or state governments remain free to regulate the CAD files in ways that avoid the constitutional defects explored in this comment. So long as the discretion of the presiding governmental authority is channeled when deciding who can access the files, and the regulatory law allows for sufficient alternative channels for non-prohibited persons to access and use

¹⁹⁹ *Bernstein v. U.S. Dep't of State*, 922 F. Supp. 1426, 1435 (N.D. Cal. 1996).

²⁰⁰ *See supra* Section III(A).

²⁰¹ *See supra* Section III(B).

²⁰² *See supra* Section IV(A).

²⁰³ *See supra* Section IV.

²⁰⁴ *See supra* Section IV(A).

²⁰⁵ *See id.*

²⁰⁶ “Viewpoint discrimination is thus an egregious form of content discrimination. The government must abstain from regulating speech when the specific motivating ideology or the opinion or perspective of the speaker is the rationale for the restriction.” *Rosenberger v. Rector & Visitors of Univ. of Va.*, 515 U.S. 819, 829 (1995).

²⁰⁷ *See supra* Section IV(B)(I).

²⁰⁸ *See supra* Section IV(B)(II).

the files for a lawful purpose, the laws will not violate the First Amendment rights of those publishing, transferring, or consuming the CAD files.