

2000

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Katherine A. Moerke

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Recommended Citation

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<https://scholarship.law.umn.edu/mlr/1733>

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Note

Free Speech to a Machine? Encryption Software Source Code Is Not Constitutionally Protected "Speech" Under the First Amendment

*Katherine A. Moerke**

In the middle of the last century, many scientists, engineers, and science-fiction writers predicted that the future would be transformed by robotics, with robots replacing human laborers on a grand scale.¹ This has not yet happened; instead, one of the largest, unanticipated technological transformations of society is the prevalence of personal computers in people's daily lives, both at work and at home, in a way and to a degree few imagined.² With computers comes a profusion of software—the mechanism by which modern computer hardware serves multiple functions (like word processor, video game, and web browser). People create software to operate computers by writing software source code in various programming languages. Currently, a debate is raging within legal, software, and academic communities about whether source code is speech in the First Amendment sense.

This question is important, and not merely theoretical, as it is sure to arise in numerous contexts in which computer programmers challenge various government restrictions affecting software on free speech grounds. The first of these challenges concerns the federal government's export regulations of encryption software (which allow for concealed electronic communication) and presents the opportunity for courts to consider and determine the legal status of software under the First Amendment. The government regulates the export of various crypto-

* J.D. Candidate 2001, University of Minnesota Law School; B.A. 1993, Carleton College. The author would like to thank Professor Daniel A. Farber for his insights and constructive criticism and Nicholas A. Coult for his support and his perspectives as a mathematician and computer scientist.

1. See Hans Moravec, *Rise of the Robots*, SCI. AM., Dec. 1999, at 124, 124.
2. See *id.*

graphic technologies (including software) for national security reasons and thereby limits computer programmers' abilities to distribute encryption software freely, such as by posting it on the Internet.³ People have brought suit against these regulations, alleging that they abridge the freedom of speech guaranteed by the United States Constitution.⁴ Specifically, they argue that source code, the highly-structured text in which computer programs are written, is constitutionally protected speech.

The United States Court of Appeals for the Ninth Circuit recently agreed that source code is protected speech in *Bernstein v. United States Department of Justice*, a panel decision affirming the district court's broader holding.⁵ The court ruled that the challenged export regulations are an impermissible prior restraint on speech.⁶ In contrast, two other federal district courts have held that the challenged export regulations do not violate the First Amendment. *Karn v. United States Department of State* found the regulations valid without determining whether encryption source code is constitutionally protected speech.⁷ Contrary to *Bernstein*, *Junger v. Daley* found encryption software source code insufficiently expressive to merit full First Amendment protection.⁸ These cases are significant because of their practical importance to the field of encryption and to the validity of the export regulations.⁹ They are

3. See *infra* Part I.D (discussing the export regulations of encryption software).

4. See *Bernstein v. United States Dep't of Justice*, 176 F.3d 1132, 1136, *reh'g granted*, 192 F.3d 1308 (9th Cir. 1999); *Junger v. Daley*, 8 F. Supp. 2d 708, 712 (N.D. Ohio 1998); *Karn v. United States Dep't of State*, 925 F. Supp. 1, 9, 12 (D.D.C. 1996).

5. *Bernstein*, 176 F.3d at 1147. The Ninth Circuit has granted rehearing en banc. See *Bernstein v. United States Dep't of Justice*, 192 F.3d 1308 (9th Cir. 1999). Oral argument is scheduled for March 21, 2000. See *Bernstein v. United States Dep't of Justice*, Order Granting Government Motion to Reschedule Oral Argument, available in EFF "Legal Cases-Crypto-Bernstein v. US Dept. of State: Legalese" Archive (last modified Oct. 29, 1999) <http://www.eff.org/pub/Privacy/ITA.Legal/19991028_ord_gran_resch.html>. Regardless of the outcome on rehearing, the court's initial groundbreaking decision—finding source code expression under the First Amendment—will remain influential in other conflicts involving free speech and computer software.

6. See *Bernstein*, 176 F.3d at 1145.

7. *Karn*, 925 F. Supp. at 8-9.

8. *Junger*, 8 F. Supp. 2d at 717-18.

9. Several commentators have discussed these cases and evaluated the First Amendment constitutionality of the export controls on encryption software. See, e.g., Patrick Ian Ross, Comment, *Bernstein v. United States De-*

also germane to the fundamental question of what constitutes "speech" under the First Amendment. Other courts will look to the reasoning and analysis of these conflicting decisions for guidance when resolving free speech challenges to government regulations of different types of computer software in the future.¹⁰

This Note discusses whether encryption software source code is speech under the First Amendment. Part I outlines relevant free speech principles, describes encryption software source code, summarizes the challenged regulations, and explains the reasoning of the *Bernstein*, *Junger*, and *Karn* decisions. Part II compares and critiques the constitutional frameworks of these cases and evaluates the technical nature of source code. This Note concludes that encryption software source code itself is not speech under the First Amendment, although it may be entitled to some First Amendment protection nonetheless because it protects the ability to speak privately.

I. FREE SPEECH PRINCIPLES AND GOVERNMENT REGULATION OF ENCRYPTION SOFTWARE

The First Amendment creates the right to free speech and protects against state censorship of expression. Whether gov-

partment of State, 13 BERKELEY TECH. L.J. 405, 415-16 (1998) (discussing the first district court opinion in *Bernstein* and concluding that the court's result was correct, but its reasoning suspect because "[n]ot all source code is speech protected by the First Amendment"); James J. Carter, Comment, *The Devil and Daniel Bernstein: Constitutional Flaws and Practical Fallacies in the Encryption Export Controls*, 76 OR. L. REV. 981, 982 (1997) (discussing the *Bernstein*, *Karn*, and *Junger* district court opinions and focusing on the effectiveness of the encryption export controls); John P. Collins, Jr., Case Note, *Speaking in Code*, 106 YALE L.J. 2691, 2692 (1997) (arguing that cryptographic computer source code is "pure conduct not entitled to any First Amendment protection"); David T. Movius, Note & Comment, *Bernstein v. United States Department of State: Encryption, Justiciability, and the First Amendment*, 49 ADMIN. L. REV. 1051, 1069-70 (1997) (approving the district court opinions in *Bernstein* and focusing on changes in the relevant export regulations); Yvonne C. Ocrant, Comment, *A Constitutional Challenge to Encryption Export Regulations: Software Is Speechless*, 48 DEPAUL L. REV. 503, 505 (1998) (discussing the *Bernstein* and *Karn* district court opinions and arguing that 1) "encryption software is not speech," 2) "even if software is speech, software is not speech protected by the First Amendment," and 3) "even if software is speech protected under the First Amendment, software is expressive conduct and thus is afforded limited First Amendment protection").

10. Circuit Judge Bright, sitting by designation, suggested that the importance of this issue makes *Bernstein* appropriate for review by the United States Supreme Court. See *Bernstein*, 176 F.3d at 1147 (Bright, J., concurring).

ernment regulations abridge the freedom of speech depends on the type of speech and the type of regulations involved. The federal government's export regulations of encryption software, which allow for the encoding and decoding of electronic messages or information, give rise to the question of whether encryption software source code is protected speech under the First Amendment. Three federal courts have answered this question, each reaching a different conclusion.

A. PROTECTED "SPEECH" UNDER THE FIRST AMENDMENT

The free speech right is expressly granted in the United States Constitution. The First Amendment provides that "Congress shall make no law . . . abridging the freedom of speech, or of the press."¹¹ From this language, it seems obvious that the initial question asked in a free speech challenge necessarily must be whether "speech" (or "the press") is involved at all. Supreme Court precedent has, however, provided surprisingly little guidance on this issue.¹² Most First Amendment cases do not begin by determining whether a certain activity is speech;¹³ and this issue usually is not discussed when the activity in question is plainly speech protected by the First Amendment, such as a political debate or dramatic performance.¹⁴

The Supreme Court has provided guidance about what constitutes speech under the First Amendment most often when the activity in question has involved non-verbal expression.¹⁵ As the Court has clearly stated, the protection of the First Amendment "does not end at the spoken or written

11. U.S. CONST. amend. I.

12. See generally R. Polk Wagner, *The Medium Is the Mistake: The Law of Software for the First Amendment*, 51 STAN. L. REV. 387 (1999) (discussing and contrasting what the author terms the Supreme Court's ontological mode, which focuses on the alleged "speech," with the teleological mode, which focuses on the motive of the regulations, and concluding that the teleological approach is preferable for extending robust First Amendment protection to new media).

13. See *id.* at 392 ("That the threshold question is not always explicitly answered by the Court does not mean that it does not exist.").

14. See *id.* at 392-93.

15. See, e.g., *Barnes v. Glen Theatre, Inc.*, 501 U.S. 560, 566-67 (1991) (concluding that prohibitions on nude dancing do not violate the First Amendment); *Spence v. Washington*, 418 U.S. 405, 415 (1974) (per curiam) (concluding that flag defacing could be protected under the First Amendment); *United States v. O'Brien*, 391 U.S. 367, 382-83 (1968) (concluding that draft card burning is not protected under the First Amendment).

word.”¹⁶ Therefore, when a person chooses not to articulate his views in words, the Court determines whether his conduct is “sufficiently imbued with elements of communication” to implicate the First Amendment.¹⁷ This expressive conduct analysis is most applicable when “symbolic speech” is involved.¹⁸

The Supreme Court has also emphasized the values embraced by the First Amendment in determining whether a certain activity or class of activities constitutes speech, because “not all speech is of equal First Amendment importance.”¹⁹ The Court has emphasized repeatedly that the judiciary must be sensitive to any infringement of “genuinely serious literary, artistic, political, or scientific expression.”²⁰ Free speech values include the “marketplace of ideas” and search for truth,²¹ unimpaired political discussion,²² and individualism and autonomy. Although speech on a particular occasion need not promote these values to be protected, consideration of values influences the Court’s determinations of what types of expression are entitled to First Amendment protection.²³ For example, although an activity, such as advertising product prices, is

16. *Texas v. Johnson*, 491 U.S. 397, 406 (1989) (holding that flag burning is protected speech).

17. *Spence*, 418 U.S. at 409, 415 (holding that a flag improper-use statute, as applied to appellant’s activity of displaying a flag with a peace symbol affixed, impermissibly infringed protected activity); see also *O’Brien*, 391 U.S. at 377 (holding that governmental regulation preventing draft-card burning did not violate the First Amendment because it was a narrow means of protecting a substantial interest).

18. See, e.g., *Barnes*, 501 U.S. at 566-67 (applying the four-part *O’Brien* test).

19. *Dun & Bradstreet, Inc. v. Greenmoss Builders, Inc.*, 472 U.S. 749, 758 (1985) (finding that matters of public concern are of more value than those that are only of private concern).

20. E.g., *Miller v. California*, 413 U.S. 15, 23 (1973) (incorporating this phrasing into its test of what constitutes obscenity). The Court stated in dicta that “[t]he First Amendment protects works which, taken as a whole, have serious literary, artistic, political, or scientific value.” *Id.* at 34.

21. See, e.g., *Red Lion Broad. Co. v. FCC*, 395 U.S. 367, 390 (1969). “It is the purpose of the First Amendment to preserve an uninhibited marketplace of ideas in which truth will ultimately prevail . . .” *Id.* (citations omitted).

22. See, e.g., *Roth v. United States*, 354 U.S. 476, 484 (1957) (stating that free speech assures “unfettered interchange of ideas for the bringing about of political and social changes desired by the people” and upholding a prohibition on mailing obscene materials).

23. See *id.* (emphasizing that obscenity, “as utterly without redeeming social importance,” is not protected); *Chaplinsky v. New Hampshire*, 315 U.S. 568, 572 (1942) (emphasizing that fighting words are so far removed from any “exposition of ideas” that they are not entitled to free speech protection).

related to the commercial marketplace, it may also have value as speech in the "marketplace of ideas."²⁴ Conversely, types of speech categorically excluded from free speech protection are excluded (at least in part) because they are considered of slight social value²⁵ or even directly harmful.²⁶ In some sense, these types of speech are not provided First Amendment protection because they are not speech at all.²⁷ The proper understanding, though, is that these types of expression are unprotected speech.²⁸

Because of the scarcity of precedent concerning what constitutes speech under the First Amendment, the Supreme Court's specific holdings also have increased relevance to the issue. Either by neglecting or by applying analysis about what constitutes speech, the Supreme Court has concluded that the freedom of speech may encompass, for example, flag burning,²⁹

24. *Virginia State Bd. of Pharmacy v. Virginia Citizens Consumer Council*, 425 U.S. 748, 762 (1976) (emphasizing that commercial speech—publishing commercial drug prices—is not wholly unrelated to traditional free speech values and holding that it is protected by the First Amendment).

25. *See, e.g., Roth*, 354 U.S. at 484 (finding obscenity unprotected for this reason).

26. *See United States v. O'Brien*, 391 U.S. 367, 382 (1968) (contrasting the draft-card-burning statute with a situation where the governmental regulatory interest arises because the communication in question "is itself thought to be harmful").

27. This reasoning does not always apply, however. For example, fighting words are an unprotected category of speech, *see infra* note 38 and accompanying text, but shouting "I am going to kill you" is obviously speech in the ordinary sense of the word.

28. *See R.A.V. v. City of St. Paul*, 505 U.S. 377, 383 (1992) (noting that the freedom of speech does not extend to a few limited categories of speech). The Court noted that it has:

sometimes said that these categories of expression are "not within the area of constitutionally protected speech" . . . or that the "protection of the First Amendment does not extend" to them. . . . Such statements must be taken in context, however, and are no more literally true than is the occasionally repeated shorthand characterizing obscenity "as not being speech at all." . . . What they mean is that these areas of speech can, consistently with the First Amendment, be regulated *because of their constitutionally proscribable content* (obscenity, defamation, etc.).

Id. (quoting *Sable Communications, Inc. v. FCC*, 492 U.S. 115, 124 (1989); *Bose Corp. v. Consumers Union of United States, Inc.*, 466 U.S. 485, 504 (1984); *Roth v. United States*, 354 U.S. 476, 483 (1957); Cass R. Sunstein, *Pornography and the First Amendment*, 1986 Duke L.J. 589, 615 n.146)).

29. *See Texas v. Johnson*, 491 U.S. 397, 418 (1989) (holding that a conviction for burning the United States flag as a political protest violates the First Amendment because "the expressive, overtly political nature of the conduct was both intentional and overwhelmingly apparent"); *see also Spence v.*

a parade,³⁰ the wearing of black armbands as a protest,³¹ and nude dancing—“expressive conduct within the outer perimeters of the First Amendment.”³² Speech is protected if it is sold for profit, such as in books or movies, or proposes a commercial transaction.³³ The First Amendment protects traditional forms of expression, such as peacefully distributing leaflets,³⁴ but also affords robust protection to the Internet, as a new mode of communication.³⁵ Some lower courts have concluded that choice of language is expression under the First Amendment.³⁶

Conversely, the Supreme Court has excluded categorically several types of speech from protection under the First Amendment.³⁷ Fighting words, for example, are not protected

Washington, 418 U.S. 405, 415 (1974) (per curiam).

30. See *Hurley v. Irish-American Gay, Lesbian & Bisexual Group*, 515 U.S. 557, 568-70 (1995) (holding that a parade was protected expression because marchers are making a collective point, not just moving from here to there).

31. See *Tinker v. Des Moines Indep. Community Sch. Dist.*, 393 U.S. 503, 505-06 (1969) (holding that the wearing of armbands conveyed an unmistakable message and was protected speech).

32. In *Barnes v. Glen Theatre, Inc.*, 501 U.S. 560, 566 (1991) (plurality opinion), Chief Justice Rehnquist accepted the premise that nude dancing is sufficiently expressive to receive some First Amendment protection. See *id.* The state’s ordinance prohibiting public nudity was content-neutral, however, and constitutional under the *O’Brien* test. See *id.* at 567.

33. See *Virginia State Bd. of Pharmacy v. Virginia Citizens Consumer Council*, 425 U.S. 748, 761, 770 (1976) (holding that commercial speech is protected but that some regulation is permissible) (citations omitted).

34. See *Organization for a Better Austin v. Keefe*, 402 U.S. 415, 419 (1971) (holding that peaceful distribution of informational literature was unconstitutionally prohibited by injunction) (citations omitted).

35. See *Reno v. ACLU*, 521 U.S. 844, 859-64 (1997) (holding that the “indecent transmission” and “patently offensive display” provisions of the Communications Decency Act of 1996 abridge the freedom of speech protected by the First Amendment).

36. See, e.g., *Asian Am. Bus. Group v. City of Pomona*, 716 F. Supp. 1328, 1330 (C.D. Cal. 1989) (holding that “[c]hoice of language is a form of expression as real as the textual message conveyed”); see also *Yniguez v. Arizonans for Official English*, 69 F.3d 920, 934-36 (9th Cir. 1995) (en banc) (discussing the fact that speech in any language is protected by the First Amendment), cert. granted, 517 U.S. 1102 (1996), vacated sub nom. *Arizonans for Official English v. Arizona*, 520 U.S. 43 (1997). The Ninth Circuit, in assessing the constitutionality of an English-only amendment to Arizona’s constitution, concluded that “[l]anguage is by definition speech, and the regulation of any language is the regulation of speech.” *Yniguez*, 69 F.3d at 934-35.

37. The classic illustration of this maxim is that one may not cry “fire” falsely in a crowded theatre. See, e.g., *Schenck v. United States*, 249 U.S. 47, 52 (1919) (“The most stringent protection of free speech would not protect a man in falsely shouting ‘fire’ in a theatre and causing a panic.”). Of course,

because the speech itself inflicts injury or tends to incite immediate violence.³⁸ Likewise, obscenity³⁹ and defamation⁴⁰ are not protected by the First Amendment.

The First Amendment does not apply only to protected speech itself. It protects the communication, the speaker, and the listener(s).⁴¹ Therefore, the freedom of speech may not be abridged merely because the speaker could speak elsewhere or because the speaker's listeners could receive the message by other means.⁴² The First Amendment may also protect the right not to speak publicly.⁴³

one can cry "fire" falsely in a crowded theatre. The point is that the government constitutionally may punish one for doing so.

38. See *Chaplinsky v. New Hampshire*, 315 U.S. 568, 572 (1942) (upholding a criminal conviction under a statute prohibiting language tending to incite a breach of the peace because appellant's speech constituted non-protected conduct).

39. See *Roth v. United States*, 354 U.S. 476, 485 (1957). *Miller v. California* set out the current standard of what constitutes obscenity:

The basic guidelines for the trier of fact must be: (a) whether "the average person, applying contemporary community standards" would find that the work, taken as a whole, appeals to the prurient interest; (b) whether the work depicts or describes, in a patently offensive way, sexual conduct specifically defined by the applicable state law; and (c) whether the work, taken as a whole, lacks serious literary, artistic, political, or scientific value.

413 U.S. 15, 24 (1973) (citations omitted); cf. *Jacobellis v. Ohio*, 378 U.S. 184, 197 (1964) (Stewart, J., concurring) (stating that obscenity is difficult to define, but "I know it when I see it").

40. See *New York Times Co. v. Sullivan*, 376 U.S. 254, 280-83 (1964). Although defamation is an unprotected category of speech, the Court held that a public official may recover damages only when a statement was made with "actual malice." *Id.* at 280.

41. See *Virginia State Bd. of Pharmacy v. Virginia Citizens Consumer Council*, 425 U.S. 748, 756-57 (1976) (citations omitted).

42. See *id.* at 756 n.14; *Schneider v. New Jersey*, 308 U.S. 147, 163 (1939) ("[O]ne is not to have the exercise of his liberty of expression in appropriate places abridged on the plea that it may be exercised in some other place.").

43. See *Harper & Row, Publishers, Inc. v. Nation Enters.*, 471 U.S. 539, 559 (1985) (quoting *Estate of Hemingway v. Random House, Inc.*, 23 N.Y.2d 341, 348 (1986)). The Court stated:

The essential thrust of the First Amendment is to prohibit improper restraints on the *voluntary* public expression of ideas; it shields the man who wants to speak or publish when others wish him to be quiet. There is necessarily, and within suitably defined areas, a concomitant freedom *not* to speak publicly, one which serves the same ultimate end as freedom of speech in its affirmative aspect.

Id.

B. "ABRIDGING" THE FREEDOM OF SPEECH

Despite the absolute wording of the First Amendment, the free speech right is not absolute, and the government may regulate speech in certain circumstances.⁴⁴ Not all speech is protected, and not all protected speech is protected equally.⁴⁵ Therefore, whether regulations abridge the freedom of speech depends on the type of speech and the type of regulation.⁴⁶

First, the constitutionality of state regulation of speech depends on the type of speech involved. Categories of unprotected speech may be regulated, prevented, and punished.⁴⁷ Regulations affecting less-protected categories of speech are subject to less stringent judicial review than those affecting fully-protected speech.⁴⁸ Although the Supreme Court has recognized some differences in justifiable government regulations of speech depending on the medium involved,⁴⁹ First Amendment scrutiny of speech through the Internet is not similarly qualified.⁵⁰

Second, government regulations may violate the First Amendment by restricting speech based on its content⁵¹ or by acting as a prior restraint on speech. The freedom of speech generally prevents the government from censoring speech be-

44. See *Chaplinsky v. New Hampshire*, 315 U.S. 568, 571-72 (1942).

45. See *Roth v. United States*, 354 U.S. 476, 483 (1957) ("[T]he First Amendment was not intended to protect every utterance.").

46. The First Amendment restricts *government* action. In other words, the "freedom of speech" applies to the censorship of speech by the government. Thus, it does not violate the First Amendment, when, for example, a newspaper chooses not to publish a letter to the editor.

47. See *Roth*, 354 U.S. at 485.

48. Regulations of fully-protected speech are subject to strict judicial scrutiny. Regulations affecting less-protected speech are subject to intermediate scrutiny. Under intermediate scrutiny: "First, the government must assert a substantial interest in support of its regulation; second, the government must demonstrate that the restriction on commercial speech directly and materially advances that interest; and third, the regulation must be 'narrowly drawn.'" *Florida Bar v. Went For It, Inc.*, 515 U.S. 618, 624 (1995) (quoting *Central Hudson Gas & Elec. Corp. v. Public Serv. Comm'n*, 447 U.S. 557, 564-65 (1980)).

49. In *Southeastern Promotions, Ltd. v. Conrad*, the Supreme Court stated that "[e]ach medium of expression . . . may present its own problems." 420 U.S. 546, 557 (1975). Some cases have recognized special justifications for regulation of the broadcast media. See, e.g., *FCC v. Pacifica Found.*, 438 U.S. 726, 760-61 (1978); *Red Lion Broad. Co. v. FCC*, 395 U.S. 367, 396 (1969).

50. See *supra* note 35 and accompanying text.

51. Unprotected categories of speech are the exception to this rule, of course, since they are excluded from protection based precisely on content.

cause of disapproval of the views expressed or disagreement with its message.⁵² Accordingly, content-based regulations are presumptively impermissible and subject to strict scrutiny.⁵³

Content-neutral regulations, on the other hand, are subject only to intermediate scrutiny.⁵⁴ When content-neutral government regulations restrict expressive conduct, in which both speech and non-speech elements are present, a sufficiently important government interest for regulating the non-speech aspect(s) justifies incidental limitations on free speech.⁵⁵ *United States v. O'Brien* laid out the following four-part test to determine whether government regulations are permissible under these circumstances:

[A] government regulation is sufficiently justified if it is within the constitutional power of the Government; if it 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

52. See, e.g., *R.A.V. v. City of St. Paul*, 505 U.S. 377, 381-82 (1992); *Texas v. Johnson*, 491 U.S. 397, 414 (1989) (stating that a "bedrock principle" of the First Amendment "is that the government may not prohibit the expression of an idea simply because society finds the idea itself offensive or disagreeable").

53. See, e.g., *Turner Broad. Sys., Inc. v. FCC*, 512 U.S. 622, 642 (1994); *Boos v. Barry*, 485 U.S. 312, 321 (1988) (plurality opinion). "Our cases indicate that . . . a content-based restriction on *political speech* in a *public forum* . . . must be subjected to the most exacting scrutiny." *Boos*, 485 U.S. at 321 (citing *Board of Airport Comm'rs v. Jews for Jesus*, 482 U.S. 569, 572-573 (1987); *Cornelius v. NAACP Legal Defense & Educ. Fund, Inc.*, 473 U.S. 788, 800 (1985); *Perry Educ. Ass'n v. Perry Local Educators' Ass'n*, 460 U.S. 37, 45 (1983); *United States v. Grace*, 461 U.S. 171, 177 (1983)). Strict scrutiny requires narrowly tailored regulations necessary to serve a compelling state interest. See, e.g., *Turner Broad. Sys., Inc.*, 512 U.S. at 642; *Boos*, 485 U.S. at 321. Essentially, a content-based regulation requires reading, listening to, or otherwise observing the speech in order to regulate it. In contrast, an example of content-neutral regulation would be the restriction of noise above a certain decibel after a certain time of night.

54. See, e.g., *Turner Broad. Sys., Inc.*, 512 U.S. at 662 (citing *United States v. O'Brien*, 391 U.S. 367, 377 (1968)). Intermediate scrutiny requires an important or substantial government interest and narrowly tailored regulations that are "unrelated to the suppression of free expression." *Id.* Regulations on less-protected speech are also subject to intermediate scrutiny. See *supra* note 48 and accompanying text.

55. See *Clark v. Community for Creative Non-Violence*, 468 U.S. 288, 289 (1984) (holding that "a National Park Service regulation prohibiting camping in certain parks [does not violate] the First Amendment when applied to prohibit demonstrators from sleeping in Lafayette Park and the Mall in connection with a demonstration intended to call attention to the plight of the homeless"). The Court assumed that the plaintiffs' demonstration was expressive conduct and applied intermediate scrutiny. See *id.* at 293.

essential to the furtherance of that interest.⁵⁶

This balancing test is most often applied to symbolic speech.⁵⁷

Another primary purpose of the First Amendment is to prevent prior restraints on speech⁵⁸ because such restraints pose the dangers of government censorship as well as “self-censorship.”⁵⁹ Therefore, regulations that act as prior restraints on speech and publication, like content-based regulations, also have a “heavy presumption” against constitutional validity and are subject to the strictest judicial scrutiny.⁶⁰ Prior restraints may arise by judicial injunctions preventing publication or through licensing schemes that allow unrestrained government discretion to restrict speech.⁶¹

Plaintiffs may bring facial challenges⁶² to regulations that allegedly constitute prior restraints when the regulations “have a close enough nexus to expression, or to conduct commonly associated with expression, to pose a real and substantial threat” of censorship.⁶³ To be constitutional, prior restraints must pro-

56. 391 U.S. 367, 377 (1968).

57. See, e.g., *Clark*, 468 U.S. at 289 (involving demonstration about the plight of the homeless by sleeping outside in tents).

58. See *Near v. Minnesota ex rel. Olson*, 283 U.S. 697, 713 (1931).

59. *City of Lakewood v. Plain Dealer Publ'g Co.*, 486 U.S. 750, 757 (1988).

60. E.g., *New York Times Co. v. United States*, 403 U.S. 713, 714 (1971) (per curiam); *Organization for a Better Austin v. Keefe*, 402 U.S. 415, 418-19 (1971) (citations omitted); see also *Southeastern Promotions, Ltd. v. Conrad*, 420 U.S. 546, 558 (1975) (noting that prior restraints are not “unconstitutional per se”).

61. See, e.g., *City of Lakewood*, 486 U.S. at 757 (holding that an ordinance giving the government unfettered discretion regarding the placement of newspaper racks was unconstitutional); *New York Times Co.*, 403 U.S. at 714 (reviewing the government’s request for an injunction).

62. A facial challenge contests legislation on its face, rather than as applied. In the context of this Note, this means that plaintiffs may challenge the export regulations without first applying for a license or submitting the encryption technology for a technical review. See *infra* Part I.D (discussing the regulations at issue). Although facial challenges are generally disfavored, they are permitted in the First Amendment context when a licensing scheme allows the government “unbridled discretion” and when regulations are challenged as overbroad. See *FW/PBS, Inc. v. City of Dallas*, 493 U.S. 215, 223 (1990) (determining whether the claim was within the “narrow class of permissible facial challenges to allegedly unconstrained grants of regulatory authority”).

63. *City of Lakewood*, 486 U.S. at 757. The Court emphasized that the regulation at issue was 1) “directed narrowly and specifically at expression or conduct commonly associated with expression: the circulation of newspapers;” and 2) not a law of general application carrying “little danger of censorship.” *Id.* at 760-61; see also *Roulette v. City of Seattle*, 97 F.3d 300, 303 (9th Cir. 1996) (holding that prohibition on sitting on sidewalks was not subject to fa-

vide adequate procedural safeguards.⁶⁴ If a licensing scheme does not present the "grave 'dangers'" of censorship, however, full procedural protections are not required.⁶⁵

C. ENCRYPTION SOFTWARE SOURCE CODE

The issue of whether encryption software source code is protected speech under the First Amendment arises because of the federal government's export regulations of encryption software (discussed below in Part I.D). Encryption software allows for electronic communication and information to be kept confidential. Encryption⁶⁶ translates a readable message into an indecipherable one to keep the message secret.⁶⁷ Cryptography was traditionally a military science,⁶⁸ but today is also of great interest to individuals and businesses as a way to keep communication confidential and protect privacy, especially with regard to the Internet and other digital media.⁶⁹

Computers have improved greatly the task of encryption—encoding and decoding messages.⁷⁰ Encryption software en-

cial challenge, even though sometimes sitting may be expressive).

64. See *Freedman v. Maryland*, 380 U.S. 51, 58-59 (1965). These safeguards include: 1) that the burden of proving "unprotected expression must rest on the censor"; 2) a "specified brief period" to issue or deny a license; and 3) a "prompt final judicial decision." *Id.*

65. *FW/PBS, Inc.*, 493 U.S. at 228 (quoting *Freedman*, 380 U.S. at 58). The essential safeguards that remain are that the license must be issued within a reasonable period of time and that prompt judicial review must be possible. See *id.*

66. Encryption is an application of the science of cryptography and has been around for thousands of years. See Edward J. Radlo, *Legal Issues in Cryptography*, COMPUTER LAW., May 1996, at 1, 1-2.

67. An illustrative example of encryption is provided in NATIONAL RESEARCH COUNCIL, CRYPTOGRAPHY'S ROLE IN SECURING THE INFORMATION SOCIETY 374 (1996). A simple encryption system could shift each letter of a message one position. The phrase "freedom of speech" would thus become "gssffepn pg tqffdi."

68. See Radlo, *supra* note 66, at 2. Governments use encryption to protect their communication from other nations and to attempt to decipher the protected communications of other nations.

69. See *id.* Related applications include ensuring data integrity (preventing tampering or altering a message), authenticating users (stamping messages with digital signatures), facilitating nonrepudiation (linking of a specific message with a specific sender), and maintaining confidentiality (making a message readable only to the intended recipient). See NATIONAL RESEARCH COUNCIL, *supra* note 67, at 374.

70. See Radlo, *supra* note 66, at 2 (noting that mechanical encryption systems were developed around the turn of the century and that computerized systems were developed beginning in the 1950s).

crypts readable "plaintext" into unintelligible "ciphertext" by using a mathematical algorithm.⁷¹ Encryption software also decrypts ciphertext back into plaintext for the recipient with the appropriate compatible "key."⁷² In other words, the key "unlocks" the encoded message.

Computer programmers develop encryption software, as they do all software, by writing source code.⁷³ Source code is the text of computer software written in a high-level programming language.⁷⁴ Source code contains precise operating instructions and may also contain comments about the code.⁷⁵ Programmers write source code in any of numerous programming languages, such as Java or C++.⁷⁶ Programming languages are highly structured and allow software developers to produce executable computer programs.⁷⁷ A compiler translates source code into object code, comprised of binary digits (1s and 0s), which the computer can directly read to execute a function.⁷⁸ Hence, once source code is compiled into object code, the computer may run the software program.⁷⁹

71. *See id.* at 1; *see also* *Bernstein v. United States Dep't of Justice*, 176 F.3d 1132, 1136-37, *reh'g granted*, 192 F.3d 1308 (9th Cir. 1999). An algorithm is a prescribed set of operations that performs a specific task.

72. *See* Radlo, *supra* note 66, at 1. An encryption key is analogous to a mechanical key that unlocks a mechanical door. *See id.* A key in encryption software is a word containing a certain number of bits; the number is the "keylength" or "keyspace." *See id.*; *see also* *Bernstein*, 176 F.3d at 1136-37.

73. Originally, computers did not work by running software. Instead they were manually programmed to perform specific tasks. Today, software programs enable a computer to perform numerous functions and offer various capabilities. *See* Ocrant, *supra* note 9, at 505-06 (providing a short account of software development and explaining that software makes computers "universal machines").

74. *See* Charles H. Davidson, *Object Program*, in *ENCYCLOPEDIA OF COMPUTER SCIENCE* 962 (Anthony Ralston & Edwin D. Reilly eds., 3d ed. 1993).

75. *See* Ocrant, *supra* note 9, at 507. Programmers customarily include explanatory notes about the code to document the programming methods and facilitate future modifications.

76. *See* Davidson, *supra* note 74, at 962.

77. *See id.*

78. *See id.*

79. Whether encryption software source code is speech—the issue of this Note—cannot be determined without understanding the relationship and distinctions among a mathematical algorithm, source code, and object code. This is illustrated well by the following concrete example for the Sieve of Eratosthenes, an algorithm for finding prime numbers. *See* CARL B. BOYER, *A HISTORY OF MATHEMATICS* 160-61 (Uta C. Merzbach revis., 2d ed. 1991). (This example is particularly fitting because prime numbers are significant to encryption software. For some types of public key encryption, the difficult

part of "cracking" the code can involve trying to find the prime factors of an extremely large number. Bernstein himself has posted source code for generating prime numbers on the web, using the Sieve of Atkin instead of the traditional Sieve of Eratosthenes. See D.J. Bernstein, *Number Theory* (visited Feb. 1, 2000) <ftp://koobera.math.uic.edu/www/primegen.html>. His code, unlike the code provided here, is longer and more complex because it was written, not for illustration, but to work quickly.)

MATHEMATICAL ALGORITHM

The simplest description of the algorithm is one in plain English: Make a list of all the integers less than or equal to n (and greater than one). Strike out the multiples of all primes less than or equal to the square root of n . The numbers left are the prime numbers.

Nicholas A. Coult, Sieve of Eratosthenes Description (1999) (provided for this Note) (on file with author); see also BOYER, *supra*, at 160-61.

A more formal description of the algorithm can be given in terms of mathematical steps:

Input an upper bound n .

Mark all the numbers between 2 and n with a 1.

For every number p less than or equal to the square root of n , perform the following step:

For every number j which is a multiple of p and is less than or equal to n , mark j with a 0.

Output the list of numbers between 2 and n and their associated 0s and 1s.

Those numbers marked with a 1 are prime numbers.

Nicholas A. Coult, Sieve of Eratosthenes Algorithm (1999) (provided for this Note) (on file with author).

SOURCE CODE

Following is source code for the algorithm, written in C in compilable form. (It finds the prime numbers between 1 and 100.)

```
void main(void)
{
    int i, j, p, n=100, a[101];
    a[1]=0;
    for(i=2; i<=n; i++) a[i]=1;
    p=2;
    while(p*p<=n)
    {
        j=2*p;
        while(j<=n)
        {
            a[j]=0;
            j=j+p;
        }
        do p++; while (a[p]!=1);
    }
}
```

Nicholas A. Coult, Sieve of Eratosthenes Source Code (1999) (provided for this Note) (on file with author).

D. EXPORT REGULATIONS OF ENCRYPTION SOFTWARE

The federal government's export controls on encryption software make adjudicable the question of whether source code is protected speech under the First Amendment. Although the validity of the export regulations is not the primary focus of this Note, it is nonetheless important to understand the context in which this theoretical free speech question has arisen.

The government regulates encryption software and other technologies because of foreign policy and national security interests.⁸⁰ Specifically, the regulations are based on the government's interest in intercepting and deciphering foreign communications.⁸¹ The regulations of encryption software now at issue are the Export Administration Regulations (EAR) promulgated by the Department of Commerce.⁸² The EAR regulate the export of "machine-readable" encryption source code or object code, although printed materials containing the same code are not subject to the regulations.⁸³ Posting soft-

OBJECT CODE

When compiled on a Sun SPARCstation 5 using egcs-1.1.2, the object code consists of 3,348 bytes—a string of 26,784 zeros and ones. See Interview with Nicholas A. Coult, Research Associate, Institute for Mathematics and Its Applications, University of Minnesota (Nov. 1999 & Feb. 2000). Object code length and content varies depending upon the compiler and the computer. See *id.*

80. See, e.g., 22 U.S.C.A. § 2778(a)(1) (West 1990 & Supp. 1999) (granting presidential authority to control import and export of defense articles "[i]n furtherance of world peace and the security and foreign policy of the United States").

81. See Ocrant, *supra* note 9, at 513-14 (citing *The Government's Classification of Private Ideas: Hearings Before a Subcomm. of the House Comm. on Government Operations*, 96th Cong. 423-26 (1980)). In addition, the government seeks to prevent concealed communication among criminals. See *id.* at 515.

82. See 15 C.F.R. §§ 730-774 (1998). The EAR define terms pertinent to the free speech question as follows: Encryption software—"[c]omputer programs that provide capability of encryption functions or confidentiality of information or information systems. Such software includes source code, object code, applications software, or system software," *id.* § 772, encryption source code—"precise set of operating instructions to a computer that, when compiled, allows for the execution of an encryption function on a computer," *id.*, encryption object code—"[c]omputer programs containing an encryption source code that has been compiled into a form of code that can be directly executed by a computer to perform an encryption function," *id.*

83. See *id.* § 734.3(b) & note to (b)(2) & (b)(3). Encryption software is regulated differently than other software. See *id.* § 772. According to the provision, "[e]ncryption software is controlled because . . . it has a functional capacity to encrypt information on a computer system, and not because of any

ware on the Internet is considered an export.⁸⁴ To export encryption software or technology, one must obtain a license from the government⁸⁵ or be subject to severe penalties.⁸⁶

The Clinton Administration has made and continues to make frequent changes to the export regulations governing encryption software.⁸⁷ The Administration's modifications of the

informational or theoretical value that such software may reflect, contain or represent, or that its export may convey to others abroad." *Id.*

84. *See id.* § 734.2(b)(9)(B)(ii). Nonmilitary encryption items are included in the Commerce Control List (CCL). *See id.* § 774. Under the regulations, exporting includes:

downloading, or causing the downloading of, such software to locations (including electronic bulletin boards, Internet file transfer protocol, and World Wide Web sites) outside the U.S. (except Canada), or making such software available for transfer outside the United States (except Canada), over wire, cable, radio, electromagnetic, photo optical, photoelectric or other comparable communications facilities accessible to persons outside the United States (except Canada), including transfers from electronic bulletin boards, Internet file transfer protocol and World Wide Web sites, unless the person making the software available takes precautions adequate to prevent unauthorized transfer of such code outside the United States or Canada.

Id. § 734.2(b)(9)(B)(ii).

85. *See id.* § 742.15(a). To grant a license, the government determines whether the export is "consistent with U.S. national security and foreign policy interests" on a case-by-case basis. *Id.* § 742.15(b). License applications must be resolved or referred to the President within 90 days. *See id.* § 750.4(a). Internal administrative appeals must be completed within a reasonable time. *See id.* § 756.2(c)(1). Final administrative decisions are not subject to judicial review. *See id.* § 756.2(c)(2); *see also* 22 U.S.C.A. § 2778(h) (West 1990 & Supp. 1999). A one-time technical review is now replacing the licensing requirement. *See infra* notes 87-96 and accompanying text.

86. The penalties for improperly exporting an item include fines up to five times the value of the exports or \$50,000 (whichever is greater), imprisonment for up to five years, or both. *See* 15 C.F.R. § 764.3(b)(1) (1998). Civil penalties also include fines up to \$10,000 and the denial of export privileges. *See id.* § 764.3(a)(1) & (2). Under International Traffic in Arms Regulations (ITAR), the penalties for improperly exporting an item include fines up to \$1 million, imprisonment for up to 10 years, or both. *See* 22 U.S.C.A. § 2778(c).

87. In 1996, President Clinton shifted licensing responsibility for nonmilitary encryption items from the State Department to the Department of Commerce. *See* Exec. Order No. 13026, 3 C.F.R. § 228 (1996). Previously, the regulations at issue were the ITAR promulgated by the State Department to implement the Arms Export Control Act. *See* 22 C.F.R. §§ 120-130 (1998). The ITAR include the United States Munitions List (USML), which designates "defense articles" subject to the regulations. *Id.* § 121.1. Congress enacted the Arms Export Control Act (AECA) to regulate the import and export of products with military uses. *See* 22 U.S.C.A. § 2778. The Arms Export Control Act (AECA) authorizes the President to "control the import and export of defense articles and defense services and to provide foreign policy guidance to persons of the United States involved in the export and import of such articles and services." *Id.* § 2778(a)(1).

regulations seem intended to address industry concerns about international business competition, not to avoid the free speech issue.⁸⁸ In September 1999, President Clinton again announced several changes in the Administration's export policy.⁸⁹ Exports will continue to be prohibited to seven nations considered terrorist.⁹⁰ Otherwise, the licensing requirement for encryption commodities and software will be replaced with a one-time technical review.⁹¹ Licenses would still be required for exports of encryption technology and software source code.⁹² In October 1999, however, the Clinton Administration announced the possibility of relaxed export regulations on computer source code as well.⁹³ These revised encryption regulations were released in January 2000.⁹⁴ Now, encryption source code also may be distributed to foreign nations (except for those seven considered terrorist) following the one-time technical review, rather than the licensing requirement.⁹⁵ Although the

88. The Administration is, however, not ignorant of the issue. The Executive Order transferring the authority of the regulations to the Commerce Department stated that "the export of encryption software, like the export of other encryption products described in this section, must be controlled because of such software's functional capacity, rather than because of any possible informational value of such software." Exec. Order No. 13026, 3 C.F.R. § 228 (1996).

89. See Jeri Clausing, *In a Reversal, White House Will End Data-Encryption Export Curbs*, N.Y. TIMES, Sept. 17, 1999, at C1.

90. See *id.* These countries are Iran, Iraq, Libya, Syria, Sudan, North Korea, and Cuba. See *id.*

91. See U.S. Dep't of Commerce, *Update to Encryption Policy: Questions and Answers* (last modified Sept. 16, 1999) <www.bxa.doc.gov/Encryption/q&a99.htm>.

92. See *id.* ("Source code will continue to be reviewed under a case-by-case basis . . .").

93. See Ann Harrison, *U.S. May Soften Source-Code Export Policy*, COMPUTERWORLD, Oct. 25, 1999, at 12. Because Bernstein's prior restraint analysis would apply to the remaining restrictions on source code (i.e., the technical review as well as the prohibition to the countries designated as terrorist), the preliminary question of whether source code is protected under the First Amendment remains.

94. Originally, the Administration announced that changes would be released December 15, 1999. See *id.* The administration decided to delay the release, however, to permit further consultations with affected parties to help determine how to best match the regulations with industry practices. See U.S. Dep't of Commerce, *Statement of Commerce Under Secretary William A. Reisch On Delay of Encryption Regulation* (last modified Dec. 13, 1999) <www.bxa.doc.gov/PRESS/99/EncryptRegDelay.html>.

95. See David E. Sanger & Jeri Clausing, *U.S. Removes More Limits on Encryption*, N.Y. TIMES, Jan. 13, 2000, at C1. The new regulations were published in the Federal Register on Friday, January 14, 2000. See generally Re-

export regulations have changed, restrictions on the distribution of encryption software source code remain and continue to present the question of source code's status under the First Amendment.⁹⁶

E. CIRCUIT SPLIT: *KARN, JUNGER, AND BERNSTEIN*

In three federal cases, plaintiffs have challenged the government's export regulations of encryption software on First Amendment grounds.⁹⁷ Each case approached the free speech issue differently, and their holdings conflict. In *Karn v. United States Department of State*, the District of Columbia District Court did not determine whether encryption software source code is speech, but rather assumed that the First Amendment applies.⁹⁸ The court found the government regulation content-neutral and thus subject to the test set forth in *O'Brien*.⁹⁹ Under this test, the court found the regulation of the plaintiff's software constitutional because it was narrowly tailored to the government's significant interest in national security.¹⁰⁰

visions to Encryption Items, 65 Fed. Reg. 2492 (2000) (to be codified at 15 C.F.R. pts. 734, 740, 742, 770, 772, & 774) (interim final rule and request for comments).

96. Alan Davidson, a lawyer with the Center for Democracy and Technology, an online civil liberties group, has complained that the new regulations are still very complicated and "do not clearly fix the fundamental Constitutional flaw in the U.S. policy that says researchers have to ask for permission before they exchange ideas with people outside of the United States." Sanger & Clausing, *supra* note 95, at C23. As noted, the First Amendment is still implicated even if the speaker can express himself somewhere else. See *supra* note 42 and accompanying text.

97. See *Bernstein v. United States Dep't of Justice*, 176 F.3d 1132, 1138, *reh'g granted*, 192 F.3d 1308 (9th Cir. 1999); *Junger v. Daley*, 8 F. Supp. 2d 708, 711 (N.D. Ohio 1998); *Karn v. United States Dep't of State*, 925 F. Supp. 1, 3-4 (D.D.C. 1996). At the time of the *Karn* case, the ITAR promulgated by the State Department were in force. By the time of the *Junger* case, the Export Administration Regulations (EAR) promulgated by the Department of Commerce were in effect.

98. See *Karn*, 925 F. Supp. at 9. Although the court assumed free speech protection, it noted that "[s]ource codes are merely a means of commanding a computer to perform a function." *Id.* at 9 n.19.

99. See *id.* at 10-11; see also *supra* notes 54-57 and accompanying text (laying out the *O'Brien* test). The court rejected the plaintiff's argument for strict scrutiny of "pure speech" by its understanding that the government's rationale for the regulation determines the level of scrutiny to be applied. See *Karn*, 925 F. Supp. at 10-11.

100. See *Karn*, 925 F. Supp. at 12. Because the "plaintiff attempts to disguise a disagreement with the foreign policy judgment of the President as a factual dispute," the court rejected the plaintiff's argument that the ITAR were not narrowly tailored because encryption source code is already widely

Unlike *Karn*, the court in *Junger v. Daley* squarely addressed whether encryption source code is speech.¹⁰¹ The court rejected the argument that source code necessarily equals speech because it is written in a language, stating that the appropriate inquiry is “whether it expresses ideas.”¹⁰² Although encryption software source code can “occasionally have communicative elements,”¹⁰³ the court concluded that it is not sufficiently expressive to merit full First Amendment protection.¹⁰⁴ Consequently, it found a facial challenge inappropriate.¹⁰⁵ The court found the regulations content-neutral and therefore subject to intermediate scrutiny, which it held the regulations easily satisfied.¹⁰⁶

In *Bernstein v. United States Department of Justice*, the Ninth Circuit Court of Appeals determined whether the export regulations of encryption software are a prior restraint on speech that violates the First Amendment.¹⁰⁷ *Bernstein* developed and sought to distribute encryption source code by posting

available in foreign countries. *Id.* at 11. *Karn* granted the defendant’s motion for summary judgment with respect to the plaintiff’s First Amendment claim. *See id.* at 3. The plaintiff also claimed that the AECA and ITAR violate the Administrative Procedure Act, 5 U.S.C. § 706(2)(A) (1994), and the Fifth Amendment right to substantive due process. *See Karn*, 925 F. Supp. at 3. The court dismissed the APA claim as nonjusticiable and also granted defendant’s motion for summary judgment with respect to the plaintiff’s Fifth Amendment claims. *See id.*

101. *Junger*, 8 F. Supp. 2d at 712. To address the plaintiff’s claims (including that the regulations constituted a prior restraint as well as impermissible content discrimination of speech), the court decided “the most important issue” of “whether the export of encryption software source code is sufficiently expressive to merit First Amendment protection.” *Id.* at 715.

102. *Id.* at 716. In its opinion, the *Junger* court addressed the contrary reasoning in the *Bernstein* district court rulings that preceded it.

103. *Id.* at 717.

104. *See id.* at 712. The court denied the plaintiff’s motion for summary judgment and granted the government’s motion for summary judgment. *See id.* at 711.

105. *See id.* at 718; *see also supra* notes 58-65 and accompanying text (discussing prior restraints and facial challenges).

106. *See Junger*, 8 F. Supp. 2d at 720-23; *see also supra* text accompanying notes 51-57 (discussing content-based and content-neutral regulations). The court emphasized that the regulations are not “directed at the content of ideas.” *Junger*, 8 F. Supp. 2d at 720. The regulations satisfy intermediate scrutiny because they “enable the government to collect vital foreign intelligence, are not directed at a source code’s ideas, and do not burden more speech than necessary.” *Id.* at 723.

107. 176 F.3d 1132, 1138, *reh’g granted*, 192 F.3d 1308 (9th Cir. 1999). The court chose to frame the issue instead as a prior restraint, although the “parties and amici urge[d] a number of theories” on the court. *Id.*

it on the Internet¹⁰⁸ and brought a facial challenge to the regulations on free speech grounds.¹⁰⁹ The district court granted summary judgment to Bernstein and enjoined the government from future enforcement of the invalidated provisions.¹¹⁰ The Ninth Circuit affirmed,¹¹¹ but has since vacated this decision upon granting rehearing en banc.¹¹²

108. *See id.* at 1136-37. The State Department informed Bernstein that he needed a license because the software was classified as a munition under the ITAR.

109. *See Bernstein*, 176 F.3d at 1137. Specifically, Bernstein alleged that the AECA and the ITAR, both facially and as applied, are content-based infringements on speech and act as unconstitutional prior restraints on speech. *See Bernstein v. United States Dep't of State*, 922 F. Supp. 1426, 1430 (N.D. Cal. 1996). Bernstein also challenged the ITAR and AECA on the grounds that the act and accompanying regulations were vague and overbroad, and infringed the rights of association and equal protection. *See id.* at 1431. Finally, Bernstein also alleged that the registration processes, as well as the licensing procedures were unconstitutional, and that the actions of defendants were arbitrary and capricious and constituted an abuse of discretion under the Administrative Procedure Act. *See id.*

110. *See Bernstein*, 176 F.3d at 1136. The district court first made a preliminary finding that the source code was protected speech under the First Amendment, *see Bernstein v. United States Dep't of State*, 922 F. Supp. 1426, 1433-37 (N.D. Cal. 1996), and then held that the ITAR were an unconstitutional prior restraint on speech, *see Bernstein v. United States Dep't of State*, 945 F. Supp. 1279, 1286-92 (N.D. Cal. 1996). After these decisions, President Clinton shifted licensing authority for nonmilitary encryption commodities and technologies from the State Department to the Department of Commerce. The Commerce Department issued its own Export Administration Regulations (EAR), which implement the Export Administration Act, 50 U.S.C. §§ 2401-2420 (1994 & Supp. III 1998). Bernstein then amended his complaint to name the Commerce Department. Again, the district court granted summary judgment to Bernstein, finding the EAR facially invalid as a prior restraint on speech. *See Bernstein v. United States Dep't of State*, 974 F. Supp. 1288, 1310 (N.D. Cal. 1996), *aff'd sub nom. Bernstein v. United States Dep't of Justice*, 176 F.3d 1132 (9th Cir. 1999), *reh'g granted*, 192 F.3d 1308.

111. *See Bernstein*, 176 F.3d at 1135. At this point in the litigation, the EAR were the regulations in question.

112. *See Bernstein v. United States Dep't of Justice*, 192 F.3d 1308, 1308 (9th Cir. 1999). Oral argument for rehearing is scheduled for March 21, 2000. *See Bernstein v. United States Dep't of Justice*, Order Granting Government Motion to Reschedule Oral Argument, available in EFF "Legal Cases-Crypto-Bernstein v. US Dept. of State: Legalese" Archive (last modified Oct. 29, 1999) <http://www.eff.org/pub/Privacy/ITA...Legal/19991028_ord_gran_resch.html>. The court extended the date for oral argument to allow Bernstein and the government to address the changes in the export regulations announced by President Clinton. Although the changes in the regulations may affect the specifics of the court's prior restraint analysis, they will not affect the issue of whether source code is speech. Moreover, regardless of what the court holds in this rehearing, its initial decision remains significant because its reasoning and analysis paves the way for other courts to find source code speech in other con-

The Ninth Circuit began by determining whether *Bernstein* was eligible to bring a facial attack.¹¹³ Next, *Bernstein* addressed the “more difficult issue” of whether encryption source code constitutes expression for First Amendment purposes.¹¹⁴ Based on its understanding of source code and declarations of cryptographers that they use source code expressively, the court concluded that “encryption software, in its source code form and as employed by those in the field of cryptography, must be viewed as expressive for First Amendment purposes.”¹¹⁵ The court held that the regulations are an impermissible prior restraint¹¹⁶ because they “allow the government to restrain speech indefinitely with no clear criteria for review.”¹¹⁷

II. ENCRYPTION SOFTWARE SOURCE CODE IS NOT CONSTITUTIONALLY PROTECTED “SPEECH” UNDER THE FIRST AMENDMENT

First Amendment precedent suggests several ways to approach the issues of what is protected speech and what abridges the freedom of speech. This precedent is, however, limited in its applicability to computer software, as illustrated by the following critique of the constitutional frameworks of *Bernstein*, *Junger*, and *Karn*. A technical analysis of software source code is the only conclusive way to determine whether it is speech at all. This analysis shows that because source code is the implementation of an idea, not the expression of it, it is not entitled to First Amendment protection as a type of speech. Encryption software may still be, however, entitled to some free speech protection because it protects the ability to speak privately.

flicts involving First Amendment challenges to government restrictions on various types of software.

113. See *Bernstein*, 176 F.3d at 1139. The court reasoned that the export regulations are a licensing scheme subject to facial challenge because they plainly allow the government unrestrained discretion. See *id.*; see also *supra* notes 58-65 and accompanying text (discussing prior restraints and facial challenges).

114. *Bernstein*, 176 F.3d at 1139.

115. *Id.* at 1141.

116. See *id.* at 1144; see also *supra* notes 58-65 and accompanying text (discussing prior restraints and facial challenges).

117. *Bernstein*, 176 F.3d at 1144-45 (citing *Freedman v. Maryland*, 380 U.S. 51, 58-59 (1965)).

A. CONSTITUTIONAL ANALYSIS OF ENCRYPTION SOFTWARE

As summarized above, *Karn*, *Junger*, and *Bernstein* reached three distinct conclusions about the constitutionality of the export regulations of encryption software. That they did so is not surprising; each differently approached the question of whether encryption source code is protected under the First Amendment and whether the export regulations thereby violate the Constitution. A comparison of their conflicting frameworks exposes gaps and inconsistencies in their free speech analyses. Moreover, this discussion shows that free speech precedent is limited in its applicability to software source code and that constitutional analysis cannot conclusively determine its status under the First Amendment. In addition, no type of abridgement analysis can avoid the preliminary issue of whether source code is speech. Therefore, the only way to determine whether the export regulations abridge the freedom of speech by virtue of their restrictions on source code is to evaluate technically the nature of source code itself.

1. Is Encryption Software Source Code Protected "Speech" Under the First Amendment?

Free speech precedent suggests several ways to approach this issue, as illustrated by *Karn*, *Junger*, and *Bernstein*. *Junger* reasoned by analogy with expressive conduct.¹¹⁸ *Bernstein* discussed encryption software source code and emphasized the expressive intent of cryptographers.¹¹⁹ *Karn* avoided the question entirely by explicitly assuming that encryption source code is protected under the First Amendment.¹²⁰ A critique of these possible constitutional approaches shows that none is very relevant to computer software.

a. Is Encryption Source Code Protected "Speech" Because Writing It Is Expressive Conduct?

The question of what constitutes speech under the First Amendment,¹²¹ if asked at all, is most frequently answered in

118. See *infra* Part II.A.1.a (discussing the expressive conduct approach).

119. *Bernstein's* factual discussion of source code is critiqued below in Part II.B.1.

120. See *infra* Part II.A.2.c (discussing *Karn's* application of *O'Brien* intermediate scrutiny following its assumption that the First Amendment protects encryption source code).

121. See *supra* notes 29-36 and accompanying text (discussing what activities the Supreme Court has held expressive for First Amendment purposes).

the context of symbolic speech.¹²² Many important (and famous) free speech cases involve expressive conduct, such as dancing, demonstrating, or burning objects.¹²³ Likewise, *Junger* reasoned by analogy with symbolic speech cases to determine whether encryption source code is protected under the First Amendment,¹²⁴ but the court's analysis is limited. Essentially, the court selected a few adjectives from *Spence* and *Tinker*, and concluded that they did not apply to source code; "[b]ecause the expressive elements of encryption source code are neither 'unmistakable' nor 'overwhelmingly apparent,'" the court held that it is not sufficiently expressive for "heightened" First Amendment protection.¹²⁵

Approaching a novel free speech question by asking if expressive conduct is involved has the most case law support and guidance,¹²⁶ but limited applicability to source code. A symbolic speech inquiry is best suited for cases in which the government's challenged regulations concern "the expression of an idea through activity."¹²⁷ Many of the First Amendment cases applying this legal framework reason by analogy, and analogy between symbolic speech and source code is incongruous. Developing software is not like engaging in some kind of demonstrative behavior to make a point, particularly a political one.¹²⁸ Source code generally is not written to make a statement. Thus, this approach provides limited guidance to the issue of source code.

122. See, e.g., *Hurley v. Irish-American Gay, Lesbian, & Bisexual Group*, 515 U.S. 557 (1995) (parade-marching); *Texas v. Johnson*, 491 U.S. 397 (1989) (flag-burning).

123. See *supra* notes 15-18 and accompanying text (discussing expressive conduct cases).

124. See *Junger v. Daley*, 8 F. Supp. 2d 708, 717-18 (N.D. Ohio 1998) (citing *Texas v. Johnson*, 491 U.S. 397, 406 (1989); *Spence v. Washington*, 418 U.S. 405, 409-10 (1974) (per curiam); *Tinker v. Des Moines Indep. Community Sch. Dist.*, 393 U.S. 503, 505-06 (1969)).

125. *Junger*, 8 F. Supp. 2d at 717-18.

126. See *supra* text accompanying notes 15-18 (discussing expressive conduct cases).

127. *Spence*, 418 U.S. at 411.

128. According to the Ninth Circuit, however, Bernstein did just this. See *infra* Part II.A.1.c (discussing free speech values).

b. Is Encryption Source Code Protected "Speech" Because It Is Written in a Language?

The Supreme Court has asked explicitly whether free speech is involved when the activity at issue did not involve the use of language,¹²⁹ which could suggest that the use of language is presumptively speech under the First Amendment. To a limited extent, the Ninth Circuit in *Bernstein* made this argument;¹³⁰ conversely, *Junger* explicitly rejected it.¹³¹ It is indisputable that source code is written in a programming language. On the other hand, human languages and computer languages are substantively different: natural languages, though structured syntactically and grammatically, allow for substantial variation and error, whereas programming languages do not.¹³²

The use of language might seem, upon initial consideration, like an excellent way to determine whether speech is involved in a particular First Amendment challenge. After all, humans communicate primarily through language—"the spoken or written word."¹³³ Thus, the use of language could be a

129. See *supra* note 17 and accompanying text.

130. See *Bernstein v. United States Dep't of Justice*, 176 F.3d 1132, 1140 (describing source code), *reh'g granted*, 192 F.3d 1308 (9th Cir. 1999). The district court explicitly relied upon this reasoning. According to the court, "[l]anguage is by definition speech, and the regulation of any language is the regulation of speech." *Bernstein v. United States Dep't of State*, 922 F. Supp. 1426, 1435 (N.D. Cal. 1996) (quoting *Yniguez v. Arizonans for Official English*, 69 F.3d 920, 935 (9th Cir. 1995) (en banc), *cert. granted*, 517 U.S. 1102 (1996), *vacated on other grounds sub nom. Arizonans for Official English v. Arizona*, 520 U.S. 43 (1997)). The court could

find no meaningful difference between computer language, particularly high-level languages as defined above, and German or French. All participate in a complex system of understood meanings within specific communities. Even object code, which directly instructs the computer, operates as a "language." When the source code is converted into the object code "language," the object program still contains the text of the source program. The expression of ideas, commands, objectives and other contents of the source program are merely translated into machine-readable code.

Id.

131. See *Junger v. Daley*, 8 F. Supp. 2d 708, 716 (N.D. Ohio 1998) ("Speech' is not protected simply because we write it in a language.").

132. They also serve different functions. See *infra* Part II.B.1 (discussing the technical nature of source code). Although different programmers may write different code to solve the same problem, source code's variability, in contrast to that of human languages, is necessarily extremely limited to make the code functional (i.e., operational and without bugs).

133. *Texas v. Johnson*, 491 U.S. 397, 404 (1989).

simple way to define speech.¹³⁴ Speech in the sense of the First Amendment is not, however, defined this way.¹³⁵ Free speech protection is not limited to speech using language, as evidenced by expressive conduct cases.¹³⁶ The First Amendment also protects artistic expression void of language, such as paintings and sculptures.¹³⁷ Moreover, the fact that the First Amendment applies to expression using language does not necessarily mean that anything spoken or written in a language is expressive, and therefore within its protection.¹³⁸ American Sign Language provides for human communication and expression (and is surely entitled to First Amendment protection) despite its lack of text. Conversely, source code's use of text does not alone make it speech.

Although a more involved analysis about language and the freedom of speech would be interesting and worthwhile, another reason to reject this approach as inconclusive is elementary: the Supreme Court's categorical exclusion of some speech, like obscenity and fighting words, from the reach of the First Amendment.¹³⁹ These forms of expression are not protected, regardless of their use of language (which is likely vulgar, common language more familiar to most than complex com-

134. This might not be so simple after all, though, because defining what constitutes "language" is likely fraught with as many difficulties as the issue of what constitutes "speech."

135. Two lower court cases have defined speech this way. See *Yniguez v. Arizonans for Official English*, 69 F.3d 920, 934-36 (9th Cir. 1995) (en banc), cert. granted, 517 U.S. 1102 (1996), vacated sub nom. *Arizonans for Official English v. Arizona*, 520 U.S. 43 (1997); *Asian Am. Bus. Group v. City of Pomona*, 716 F. Supp. 1328, 1330 (C.D. Cal. 1989). The Supreme Court has not, however, done so.

136. See, e.g., *Johnson*, 491 U.S. at 404 ("We have long recognized that [First Amendment] protection does not end at the spoken or written word."). In some sense, expressive conduct cases also rely on language, albeit clearly recognizable "body language," but the Supreme Court does not approach the issue of symbolic speech in this way.

137. See, e.g., *Miller v. California*, 413 U.S. 15, 34 (1973) ("The First Amendment protects works which, taken as a whole, have serious literary, artistic, political, or scientific value."); see also *Massachusetts v. Oakes*, 491 U.S. 576, 591 (1989) (Brennan, J., dissenting) ("Photography, painting, and other two-dimensional forms of reproduction . . . are plainly expressive activities that ordinarily qualify for First Amendment protection.").

138. See *supra* text accompanying notes 37-40 (discussing the exclusion of certain types of speech such as fighting words and obscenity from First Amendment protection).

139. See *supra* notes 25-28 and text accompanying notes 37-40 (discussing what types of speech the Supreme Court has excluded categorically from First Amendment protection).

puter languages). Therefore, whether source code is speech must necessarily be based, at least in part, on some other analysis.

c. Is Encryption Source Code Protected "Speech" Because Its Use Can Implicate Free Speech Values?

The determination of what constitutes protected speech under the First Amendment may also involve a consideration of free speech values.¹⁴⁰ Such values have lent support both to categorically excluding and including types of expression under the protection of the First Amendment.¹⁴¹ Indeed, there is some authority for the argument that values are *the* determining factor of what speech is *not* protected.¹⁴² Consideration of values is also relevant to the expressive conduct approach discussed above.¹⁴³ For example, in *Spence v. Washington*, the Supreme Court emphasized the appellant's sincere and moving political statement protesting the invasion of Cambodia and the related killings at Kent State by displaying a flag with a peace sign affixed.¹⁴⁴

Core free speech values can be related to the use of source code, as both *Bernstein* and *Junger* demonstrate. Writing source code is an integral part of scientific research in many

140. This type of inquiry might also be appealing or invalid, depending on one's view of the judicial role. In a way, considering free speech values to determine whether the First Amendment applies is like taking policy into account when interpreting legislation. It can provide useful guidance, but may also result in judicial activism.

141. See *supra* text accompanying notes 19-28, 37-40 (discussing free speech values and the categorical exclusion of several types of speech, like fighting words, obscenity, and defamation because they do not serve such values).

142. According to the Supreme Court, "our society . . . has permitted restrictions upon the content of speech in a few limited areas, which are 'of such slight social value as a step to truth.'" *R.A.V. v. City of St. Paul*, 505 U.S. 377, 382-83 (1992) (quoting *Chaplinsky v. New Hampshire*, 315 U.S. 568, 572 (1942)).

143. See *supra* Part II.A.1.a.

144. 418 U.S. 405, 409 (1974) (per curiam) (making a very qualified holding by emphasizing that the flag was privately owned, displayed on private property, not permanently defaced, etc.); see also *Texas v. Johnson*, 491 U.S. 397, 420 (1989) (holding a demonstrator's flag-burning a protected activity 15 years later without the many qualifications). In *Spence*, the Court noted "that this was not an act of mindless nihilism. Rather, it was a pointed expression of anguish by appellant about the then-current domestic and foreign affairs of his government." *Spence*, 418 U.S. at 410. *But cf. Johnson*, 491 U.S. at 432 (Rehnquist, C.J., dissenting) (describing flag burning as "the equivalent of an inarticulate grunt or roar").

fields.¹⁴⁵ Moreover, scientific expression is one of four types of speech often specified as highly valued under the Constitution: the Supreme Court has repeatedly noted that the First Amendment protects “literary, artistic, political, or scientific expression.”¹⁴⁶ Likewise, *Bernstein* emphasized that the export regulations burden “scientific expression.”¹⁴⁷ That some scientists write source code as part of their research, however, does not make it scientific *expression*.¹⁴⁸

Interestingly, the use of source code may also implicate free speech values related to political expression. Junger, a law professor, apparently wanted to post encryption software on the Internet for a course about computers and the law, in part, to challenge the export regulations.¹⁴⁹ Similarly, Bernstein, a mathematics and computer science professor, sought to post his source code on the Internet, in part, according to the Ninth Circuit, as “political expression” based on his view of the export regulations as “absurd.”¹⁵⁰ This consideration did not control the court’s decision, but it, much like Spence’s actions, appears to have influenced the court.

A consideration of free speech values should not, however, determine whether source code is protected speech under the First Amendment. Although this type of analysis can be insightful, it often can be a stretch. In the Supreme Court’s decision holding commercial speech entitled to some First Amendment protection, Justice Blackmun’s emphasis on consumers’ and society’s “strong interest in the free flow of commercial information” is weak.¹⁵¹ Learning where liquor is cheapest,¹⁵² for example, is not significant to encouraging debate about the most important social and political issues of the day. At one

145. Writing source code is, of course, also an integral part of commercial software development. This commercial aspect of source code does not prevent it from being speech, *see supra* note 33 and accompanying text, but does not cut in favor of finding it speech either.

146. *E.g.*, *Miller v. California*, 413 U.S. 15, 23 (1973).

147. *Bernstein v. United States Dep’t of Justice*, 176 F.3d 1132, 1135, *reh’g granted*, 192 F.3d 1308 (9th Cir. 1999).

148. This issue is discussed more fully in Part II.B.1.

149. *See Junger v. Daley*, 8 F. Supp. 2d 708, 713-14 (N.D. Ohio 1998). The plaintiff’s website included documents about the litigation. *See id.*

150. *Bernstein*, 176 F.3d at 1141 n.14.

151. *Virginia State Bd. of Pharmacy v. Virginia Citizens Consumer Council*, 425 U.S. 748, 763-65 (1976).

152. *See, e.g.*, *44 Liquormart, Inc. v. Rhode Island*, 517 U.S. 484 (1996) (holding that ban on price advertising for alcoholic beverages abridged speech in violation of First Amendment).

time, pornographic films would routinely include brief political commentary at their beginning or end in order to claim First Amendment protection.¹⁵³ Just as obscenity is really about sex, not politics, source code is really about computer programming, not expression. Therefore, the fact that its use may implicate free speech values should not determine its First Amendment status.

d. Is Encryption Source Code Protected "Speech" Because Programmers Intend To Speak?

Some free speech precedent suggests that an actor's expressive intent may be relevant to determining whether the First Amendment is applicable.¹⁵⁴ Similarly, *Bernstein* relies on declarations from cryptographers and programmers that they express their cryptographic ideas and communicate with others in the field through source code.¹⁵⁵ This approach is flawed.

The fact that cryptographers declare source code expressive is not a sufficient basis for bringing it within the protection of the First Amendment, particularly when such declarations are self-serving. For one thing, this way of understanding source code is not universal.¹⁵⁶ More importantly, what constitutes speech should not be based on the opinions of those engaged in the activity. Surely plaintiffs often bring free speech challenges not because they thought they were engaging in speech, but rather because their lawyers see this as a potential legal ground to support their clients' interests. On the other hand, if Johnson had burned a flag to stay warm,¹⁵⁷ rather than

153. See, e.g., Frederick Schauer & Richard H. Pildes, *Electoral Exceptionalism and the First Amendment*, 77 TEX. L. REV. 1803, 1828-29 (1999) (citing FREDERICK F. SCHAUER, *THE LAW OF OBSCENITY* 43, 138-39 (1976)).

154. See, e.g., *Spence v. Washington*, 418 U.S. 405, 410-11 (1974) (per curiam) ("An intent to convey a particularized message was present.").

155. See *Bernstein*, 176 F.3d at 1140 (noting "declarations from cryptographers and computer programmers explaining that cryptographic ideas and algorithms are conveniently expressed in source code").

156. Casual conversations with programmers and others involved in the software field suggest that *Bernstein's* understanding is a minority position.

157. *Bernstein* raised this possibility in the context of rejecting the government's functionality argument, stating that if functionality trumped expression "we would have expected the Supreme Court to start and end its analysis of David Paul O'Brien's burning of his draft card with an inquiry into whether he was kept warm by the flames." *Bernstein*, 176 F.3d at 1142 n.16. This reasoning does not hold up, however, since O'Brien and Johnson clearly burned a draft card and flag respectively to make political statements, not to

to protest President Reagan, his claim challenging Texas's flag desecration statute likely would have been unsuccessful.¹⁵⁸ Nonetheless, according to the Supreme Court, "[w]e cannot accept the view that an apparently limitless variety of conduct can be labeled 'speech' whenever the person engaging in the conduct intends thereby to express an idea."¹⁵⁹ In addition, an actor's intent regarding categorically unprotected categories of speech is irrelevant to free speech protection. Therefore, although some computer programmers may profess their intent to express ideas through source code, this intent is not sufficient to bring source code within the First Amendment's protection.

e. Is Encryption Source Code Protected "Speech" Because It May Be Copyrighted?

One might think that copyright law could help determine whether source code is speech under the First Amendment, given that both areas of law protect expression. Although there is no Supreme Court case law suggesting any connection, the district court in *Bernstein* used the fact that computer software (including both source code and object code) may be copyrighted to support its conclusion that source code is speech.¹⁶⁰ The Ninth Circuit was careful to avoid this comparison, explicitly making a narrower holding than the district court.¹⁶¹ Likewise, *Junger* correctly did not discuss copyright law in its determination that source code is not protected speech under the First Amendment. Although this approach would provide some tidy analytical consistency, there is simply no precedent that what is "speech" under the First Amendment is the same as "expression" that may be copyrighted.¹⁶²

keep warm. It is unnecessary for the Court to state what is obvious.

158. See generally *Texas v. Johnson*, 491 U.S. 397 (1989).

159. *United States v. O'Brien*, 391 U.S. 367, 376 (1968).

160. See *Bernstein v. United States Dep't of State*, 922 F. Supp. 1426, 1436 (N.D. Cal. 1996). "While copyright and First Amendment law are by no means coextensive, and the analogy between the two should not be stretched too far, copyright law does lend support to the conclusion that source code is a means of original expression." *Id.*

161. See *Bernstein v. United States Dep't of Justice*, 176 F.3d 1132, 1135 1145, *reh'g granted*, 192 F.3d 1308 (9th Cir. 1999) ("[W]e employ a somewhat narrower rationale than did the district court We emphasize the narrowness of our First Amendment holding. We do not hold that all software is expressive. Much of it surely is not.").

162. See Dan L. Burk, *Patenting Speech* 15-17 (Oct. 1999) (unpublished manuscript, on file with the author) (discussing why it is problematic to

2. Do the Export Regulations of Encryption Software "Abridge" the Freedom of Speech?

As shown, *Bernstein*, *Junger*, and *Karn* each determined differently whether encryption source code is protected speech under the First Amendment. In addition, no case properly concluded that encryption source code is protected speech before proceeding to ask whether the export regulations thereby abridge the freedom of speech. *Bernstein* began with and limited its analysis to prior restraint. *Junger* applied several types of abridgement analysis to the export regulations despite the court's initial conclusion that source code is not protected under the First Amendment. *Karn* assumed that encryption source code is protected speech but substantially ignored prior restraint analysis. A critique of these approaches shows that whether encryption source code is protected under the First Amendment must be answered before abridgment is considered. If source code is not protected speech, abridgment of speech by regulations of encryption source code need not be considered.

a. Do the Export Regulations "Abridge" Speech Because They Are a Prior Restraint?

First Amendment precedent is clear that licensing schemes may constitute prior restraints and thereby abridge the freedom of speech.¹⁶³ Whether the export regulations of encryption software are a prior restraint was dismissed by *Karn* and addressed by *Junger* and *Bernstein*. A critique of their approaches shows that prior restraint analysis might apply to the challenged regulations, but only if it is first determined that encryption source code is speech protected by the First Amendment.

Karn's substantial neglect of prior restraint is puzzling given its express assumption that encryption source code is protected by the First Amendment.¹⁶⁴ *Karn* asserted that "claims of facial overbreadth and vagueness are rarely entertained with respect to content-neutral regulations,"¹⁶⁵ empha-

equate expression in the First Amendment and copyright sense and explaining tensions between the doctrines).

163. See *supra* text accompanying notes 58-65 (discussing licensing schemes and prior restraint analysis).

164. See *Karn v. United States Dep't of State*, 925 F. Supp. 1, 12-13 (D.D.C. 1996).

165. *Id.* at 13 (citing *Broadrick v. Oklahoma*, 413 U.S. 601, 613 (1973)).

sizing the intent of the government regulations. The intent of government regulations is, however, irrelevant to prior restraint analysis.¹⁶⁶ Thus, if source code is speech, prior restraints on it may violate the First Amendment.

Junger's prior restraint analysis is confusing for the opposite reason. The court's initial determination that encryption source code is not sufficiently expressive for First Amendment protection should end its First Amendment analysis, given that the freedom of speech does not apply to unprotected speech.¹⁶⁷ For this reason, *Junger's* prior restraint analysis is largely an academic exercise, as the court rejected a facial challenge by its conclusion that "exporting encryption software has little expressive nature."¹⁶⁸

Bernstein's prior restraint inquiry is also flawed. The Ninth Circuit explicitly limited its First Amendment determination to whether the challenged export regulations constitute a prior restraint on speech.¹⁶⁹ The court asked first, whether the government has "unbridled discretion," and second, whether the regulations have "a close enough nexus to expression."¹⁷⁰ Because it is not clear that the First Amendment even applies to source code, the court's second question should be resolved before the government's level of discretion is considered.

More importantly, *Bernstein's* prior restraint analysis is inappropriate because the court did not conclude that source code in general is protected speech. Prior restraint analysis is limited to situations in which government regulations are "directed narrowly . . . at expression or conduct commonly associ-

166. See *supra* notes 58-65 and accompanying text (discussing *City of Lakewood v. Plain Dealer Publ'g Co.*, 486 U.S. 750 (1988)).

167. See *supra* text accompanying notes 44-46. *Junger* applied both prior restraint and content discrimination analysis, as well as *O'Brien* intermediate scrutiny. See *Junger v. Daley*, 8 F. Supp. 2d 708, 718-19, 720-23 (N.D. Ohio 1998).

168. *Junger*, 8 F. Supp. 2d at 718.

169. See *Bernstein v. United States Dep't of Justice*, 176 F.3d 1132, 1138, *reh'g granted*, 192 F.3d 1308 (9th Cir. 1999) (stating that although "[t]he parties and amici urge a number of theories," the court limited its attention to only one). It is unclear why the court selected this "theory," because no explanation or rejection of any others is provided. See *id.* The conclusion that the regulations do constitute a prior restraint meant the court need not "resolve whether the challenged regulations constitute content-based . . . or . . . content-neutral restrictions." *Id.* at 1145.

170. *Id.* at 1139 (quoting *City of Lakewood v. Plain Dealer Publ'g Co.*, 486 U.S. 750, 763 (1988)).

ated with expression."¹⁷¹ For example, the facially challenged regulation in *City of Lakewood* affected the distribution of newspapers—speech to which the First Amendment inarguably applies.¹⁷² Unlike the regulation of newspaper circulation, the export regulations are not directed toward clearly protected expression. Indeed, if this were the case, whether source code constitutes speech would not be so difficult for courts to determine.¹⁷³ The export regulations are precisely the type of law of “general application” that the Supreme Court distinguished from the type of regulation found unconstitutional in *City of Lakewood*.¹⁷⁴ In that case, the Court explained that the dissent’s analogy between regulations affecting the distribution of newspapers versus soda vendors was inapposite because “[n]ewspapers are in the business of expression, while soda vendors are in the business of selling soft drinks.”¹⁷⁵ Likewise, source code, unlike newspapers, is in the business of programming computers, not expression. Therefore, although prior restraint analysis might apply to the export regulations, the issue of whether source code is speech must first be resolved.

b. Do the Export Regulations “Abridge” Speech Because They Are Content-Based?

Although a primary purpose of the freedom of speech is to prevent the government from censoring a message with which it disagrees,¹⁷⁶ the only case to address this type of abridgment is the case to hold that encryption source code is not protected by the First Amendment.¹⁷⁷ If, as *Junger* concluded, en-

171. *Id.* at 1149 (Nelson, J., dissenting) (quoting *Roulette v. City of Seattle*, 97 F.3d 300, 305 (9th Cir. 1996)). The dissent in *Bernstein* suggested that Bernstein’s activities may be “entitled to First Amendment protection, but that the legal path chosen to get to that protection must be the correct one.” *Id.*

172. See, e.g., *New York Times Co. v. Sullivan*, 376 U.S. 254 (1964).

173. See *Bernstein*, 176 F.3d at 1139 (stating that the “more difficult issue” is “whether encryption source code is expression” under the First Amendment).

174. See *City of Lakewood*, 486 U.S. at 760-61.

175. *Id.* at 761.

176. See *supra* notes 51-53 and accompanying text (discussing content-based regulations).

177. See *Junger v. Daley*, 8 F. Supp. 2d 708, 720-23 (N.D. Ohio 1998). In contrast, *Bernstein*, concluding that the regulations constitute an impermissible prior restraint on the freedom of speech, noted that it “need [not] resolve whether the challenged regulations constitute content-based restrictions, subject to the strictest constitutional scrutiny, or whether they are, instead,

encryption source code is not protected speech, how could the export regulations possibly be abridging *speech* through impermissible content-based discrimination? The plaintiffs' argument is that, first, source code is speech and, second, the regulations are content-based because they regulate only encryption software. This is, however, illogical; encryption is not the content of the source code, but its function.¹⁷⁸

c. Do the Export Regulations "Abridge" Speech If They Are Content-Neutral?

Karn and *Junger* both addressed whether the export regulations at issue satisfy intermediate scrutiny based on their preliminary findings that the regulations are content-neutral,¹⁷⁹ but the analysis by both courts is flawed. If encryption source code is not protected speech, as *Junger* concluded, this analysis is unnecessary.¹⁸⁰ If encryption source code is protected speech, as *Karn* assumed, the burdens on expression must be balanced to apply *O'Brien* intermediate scrutiny. Thus, this type of approach cannot avoid the issue of whether encryption source code is speech under the First Amendment.

Because the *O'Brien* standard¹⁸¹ is so lenient and easily resolved in favor of the government, courts may simply assume that speech is involved when a First Amendment claim is raised.¹⁸² *Karn* did just this, resolving the free speech challenge to the export regulations without addressing the underlying, and most interesting, constitutional question. Given the limited guidance about what (other than traditional forms of expression and expressive conduct) is speech under the First

content-neutral restrictions meriting less exacting scrutiny." *Bernstein v. United States Dep't of Justice*, 176 F.3d 1132, 1145, *reh'g granted*, 192 F.3d 1308 (9th Cir. 1999).

178. The difficulty of applying this type of free speech analysis also suggests that source code should not be considered speech.

179. See *supra* notes 98-106. See generally *supra* notes 54-57 and accompanying text (discussing judicial scrutiny of content-neutral regulations).

180. The *Junger* court reasoned that since the regulations were not content-based, they must be content-neutral. See *Junger*, 8 F. Supp. 2d at 721. Given its conclusion that encryption source code is not protected under the First Amendment, however, the court did not need to consider the intent of the regulations at all.

181. See *supra* text accompanying notes 54-57.

182. See *supra* notes 98-106 and accompanying text (summarizing the *Karn* and *Junger* courts' holdings).

Amendment, this approach has some appeal. It also has some support.¹⁸³

There is authority for the proposition that when the government's intent is content-neutral, a predicate determination of whether speech is involved is unnecessary. The Supreme Court has stated, in outlining its free speech analysis, that "[i]f the State's regulation is not related to expression, then the less stringent standard we announced in *United States v. O'Brien* for regulations of noncommunicative conduct controls."¹⁸⁴ R. Polk Wagner describes this teleological approach as one of two methods of threshold First Amendment analysis employed by the Supreme Court.¹⁸⁵ This approach cannot, however, remove entirely the issue of what constitutes speech under the First Amendment. *Karn* is incorrect that "it is unnecessary . . . to make any finding regarding the nature" of source code.¹⁸⁶ For one thing, if source code is protected speech under the First Amendment, prior restraint analysis may apply regardless of the government's intent.¹⁸⁷ For another, although *Karn* did not discuss incidental burdens on expression by the export regulations, this is one of the four factors a court must balance under *O'Brien*.¹⁸⁸ *Karn* is correct that "[t]he rationale for a regulation determines the level of scrutiny to be applied,"¹⁸⁹ but if the First Amendment does not apply in the first place, there is no need to determine the corresponding level of judicial scrutiny. Thus, courts must ultimately answer the question of whether encryption source code is speech under the First Amendment.

3. Can Constitutional Analysis Resolve the Issue?

As discussed, First Amendment precedent suggests several ways to approach the issues of what is speech and what abridges speech. Whether speech is abridged cannot be answered, however, until it is determined whether speech is even involved. Moreover, whether speech is involved cannot be adequately determined by constitutional precedent. This is because the predicate free speech question most often answered

183. See *Clark v. Community for Creative Non-Violence*, 468 U.S. 288, 293 (1984) (assuming that expression is involved and applying *O'Brien*).

184. *Texas v. Johnson*, 491 U.S. 397, 403 (1989).

185. See Wagner, *supra* note 12, at 390-91.

186. *Karn v. United States Dep't of State*, 925 F. Supp. 1, 10 (D.D.C. 1996).

187. See *supra* Part II.A.2.a.

188. See, e.g., *Turner Broad. Sys., Inc. v. FCC*, 512 U.S. 622, 642 (1994).

189. *Karn*, 925 F. Supp. at 10.

by the Supreme Court is whether the speech involved is protected speech, not whether speech is involved at all.¹⁹⁰

Similarly, *Junger* appears to have assumed that source code is speech under the First Amendment, but that certain "expressive software" is entitled to protection, whereas other "inherently functional" software is not.¹⁹¹ For example, in rejecting the use of language as a determinant factor of what constitutes speech, *Junger* stated that "[s]peech' is not protected simply because we write it in a language,"¹⁹² suggesting that the court presumed that source code is speech and that its inquiry was limited to whether encryption source code, in particular, is protected. *Bernstein* noted that it did not hold that all source code is expressive and also explicitly limited its holding to encryption software.¹⁹³ Whereas *Junger* found "encryption software . . . especially functional rather than expressive," asserting that "[c]ertain software is inherently expressive" and "other software is inherently functional,"¹⁹⁴ *Bernstein* found encryption source code expressive.

Because no precedent establishes the status of source code under the First Amendment, the proper question is not whether encryption source code, in particular, is protected, but rather whether source code, in general, is categorically *speech* at all.¹⁹⁵ The difficulties of a categorical approach are illustrated well by the Supreme Court's efforts to define obscenity.¹⁹⁶ If categorizing something is as difficult as determining whether it constitutes speech, this approach does not simplify

190. As a result, there are several categories of unprotected (and less-protected) speech under the First Amendment. See *supra* text accompanying notes 29-40; see also *R.A.V. v. City of St. Paul*, 505 U.S. 377, 383 (1992) ("[A] limited categorical approach has remained an important part of our First Amendment jurisprudence.").

191. *Junger v. Daley*, 8 F. Supp. 2d 708, 716 (N.D. Ohio 1998) (stating that to review regulations of software under the First Amendment, the court needs to examine the particular type of software involved).

192. *Id.*

193. See *Bernstein v. United States Dep't of Justice*, 176 F.3d 1132, 1145, *reh'g granted*, 192 F.3d 1308 (9th Cir. 1999).

194. *Junger*, 8 F. Supp. 2d at 716.

195. Precedent does establish that speech via the Internet is entitled to First Amendment protection. See *supra* note 35 and accompanying text. Thus, if source code is speech, posting it on the Internet does not alter this status.

196. See, e.g., *Jacobellis v. Ohio*, 378 U.S. 184, 197 (1964) (Stewart, J., concurring) (stating that obscenity is difficult to define, but "I know it when I see it").

the analysis, but this difficulty is not present with regard to source code. Although there may be a fuzzy line between what is obscene and what is not, the distinction between algorithms and source code is clear.¹⁹⁷ Wagner concludes that focusing on the medium is a mistake under the First Amendment,¹⁹⁸ but a technical analysis is the only conclusive way to determine whether the "medium" (source code) is speech in the first place.

B. TECHNICAL ANALYSIS OF ENCRYPTION SOFTWARE

As discussed, a technical analysis of software source code is the only way to determine conclusively whether it is speech under the First Amendment. This analysis shows that source code is not the expression of an idea, but its implementation: the act of writing source code is analogous to the act of constructing a machine. Moreover, implications of finding source code speech expose flaws inherent in this conclusion. Therefore, source code is not speech under the First Amendment (and the government's export regulations of encryption software do not thereby abridge the freedom of speech). Encryption software, in particular, may be entitled to First Amendment protection, however, because it provides for private speech.

1. Software Source Code Is Not Speech Under the First Amendment

Bernstein and *Junger* both approached the issue of whether encryption source code is speech under the First Amendment, in part, by analyzing the nature of source code. *Bernstein's* discussion of source code is, however, fundamentally flawed.¹⁹⁹ *Junger's* discussion is brief and inconsistent, as the court interchangeably describes the issue as "whether encryption source code is sufficiently expressive to merit heightened First Amendment protection"²⁰⁰ and "whether *the export of encryption software source code is sufficiently expressive to*

197. See *supra* note 79 (providing an example of an algorithm, written in natural language, and source code for the Sieve of Eratosthenes).

198. See Wagner, *supra* note 12, at 408.

199. The court stated that the government's view did not reflect a proper understanding of source code, but the flawed understanding is the court's own. See *Bernstein v. United States Dep't of Justice*, 176 F.3d 1132, 1145, *reh'g granted*, 192 F.3d 1308 (9th Cir. 1999). Whatever decision the Ninth Circuit reaches upon its rehearing en banc in the *Bernstein* case, its initial reasoning remains significant because of its novel analysis.

200. *Junger v. Daley*, 8 F. Supp. 2d 708, 712 (N.D. Ohio 1998).

merit First Amendment protection.”²⁰¹ Moreover, the technical analysis of encryption software by both courts appears premised on their respective First Amendment conclusions. *Bernstein* emphasized that source code, as distinguished from object code, cannot be executed directly by a machine and stated that source code’s “distinguishing feature” is that it can be “read and understood by humans.”²⁰² In contrast, *Junger* emphasized that “source code and object code are essentially interchangeable” and that although “source code is not directly executable by a computer, the computer can easily convert it into executable object code.”²⁰³

First, contrary to *Bernstein*’s reasoning, source code is the implementation of an idea, not the expression of it.²⁰⁴ In concluding otherwise, *Bernstein*’s most significant and pervasive flaw is the conflation of idea and implementation—of speech and of product. *Bernstein* emphasized that a “distinguishing feature of source code is . . . that it can be used to express an idea or a method.”²⁰⁵ The court stated further that *Bernstein* described his encryption method in his source code.²⁰⁶ *Bernstein*’s source code is not an expression of his encryption method, however, but the method itself.²⁰⁷ Likewise, contrary to the court’s statements, cryptographers do not express

201. *Id.* at 715 (emphasis added). As a result, it is not clear whether it is encryption source code itself or its export that the *Junger* court determined is not protected speech.

202. *Bernstein*, 176 F.3d at 1140 (“A computer, in fact, can make no direct use of source code until it has been translated (‘compiled’) into a ‘low-level’ or ‘machine’ language, resulting in computer-executable ‘object code.’”).

203. *Junger*, 8 F. Supp. 2d at 712.

204. *Junger* correctly stated that “what determines whether the First Amendment protects something is whether it expresses ideas.” *Id.* at 716 (citing *Virginia State Bd. of Pharmacy v. Virginia Citizens Consumer Council*, 425 U.S. 748, 762 (1976); *Roth v. United States*, 354 U.S. 476, 484 (1957)).

205. *Bernstein*, 176 F.3d. at 1140. The court acknowledged that source code can only be understood by those with a knowledge of programming languages, but noted that “[i]t must be emphasized . . . that source code is merely text.” *Id.* at 1140 n.11.

206. *See id.* at 1136 (“*Bernstein* described his method in two ways: in a paper . . . and in two computer programs . . .”).

207. The district court made the same mistake as the Ninth Circuit panel. It wrote that “[a]n encryption program expressed in source code communicates to other programmers and ultimately to the computer itself how to make the encryption algorithm (the idea) functional.” *Bernstein v. United States Dep’t of State*, 922 F. Supp. 1426, 1436 (N.D. Cal. 1996). This is flatly wrong. Source code does not express how to make the encryption algorithm functional; it makes the encryption algorithm functional.

mathematical ideas by utilizing source code;²⁰⁸ cryptographers (and other computer programmers) implement algorithms by writing source code to develop software. Mathematicians and computer scientists express algorithmic ideas in natural language or with equations and other mathematical descriptions.²⁰⁹ The expression of an algorithm is speech, but the implementation of an algorithm is not. *Bernstein* also noted that declarations from cryptographers attested to “ongoing suppression of academic publication” by the export regulations.²¹⁰ The regulations suppress only the distribution of source code in electronic form, however, not academic publications discussing or printing segments of source code. *Bernstein* thus conflates expression about encryption methods with encryption software itself.

Books, sculptures, films, and paintings, however, are all both the implementation of ideas and also protected speech at the core of the First Amendment (at least as long as they are not “obscene”). Why is source code any different? It is not that “even one drop of ‘direct functionality’ overwhelms any constitutional protections” as the government tried to assert in *Bernstein*,²¹¹ but that source code is fundamentally different from these examples, whose primary function is expression. The function of source code is not to provide a medium for expression, but to program a computer.²¹² In fact, the Ninth Circuit even acknowledged that source code is really the implementation of a method to solve a problem, not a description of how to do it. The court noted that posting software facilitates peer review, by subjecting a working model of an encryption method to rigorous testing.²¹³ Of course the implementation of an idea—be it software, a mechanical device, or a meal²¹⁴—may often con-

208. *Bernstein*, 176 F.3d. at 1141 (“By utilizing source code, a cryptographer can express algorithmic ideas . . .”).

209. See *supra* note 79 (providing an example of an algorithm, written in natural language, and source code for the Sieve of Eratosthenes).

210. *Bernstein*, 176 F.3d at 1136 n.3.

211. *Id.* at 1142. The court disagreed, stating “[t]his cannot be so.” *Id.*

212. Of course, sometimes a computer program does provide a medium for expression, such as, for example, serving as a word processor. See *infra* Part II.B.3 (discussing potential First Amendment protection of software that provides for protected expression).

213. *Bernstein*, 176 F.3d at 1136, 1141 (noting also that *Bernstein* was “seeking to present his work . . . within the academic and scientific communities”).

214. For example, the author published a recipe for soup. See N. Coult & K. Moerke, *Gingered Pumpkin-Pear Soup*, BETTER HOMES & GARDENS, Sept.

vey information about the idea, but the First Amendment is not so broad as to protect all implementation of ideas. As the Supreme Court has stated, “[i]t is possible to find some kernel of expression in almost every activity a person undertakes—for example, walking down the street or meeting one’s friends at a shopping mall—but such a kernel is not sufficient to bring the activity within the protection of the First Amendment.”²¹⁵

Second, writing source code is equivalent to a method for constructing a machine. *Bernstein* emphasized that “source code is not meant solely for the computer”²¹⁶ and that “[a] computer . . . can make no direct use of source code.”²¹⁷ Source code is not so much meant for “human analysis and understanding,”²¹⁸ however, as it is meant to allow people to program computers. Source code is primarily communication to a computer—speech to a machine. Source code is written in a language so that people can develop software, by writing, editing, and revising code in an understandable form (which object code is not). As discussed above, computers were originally developed to perform specific functions.²¹⁹ Programmers “programmed” a computer by directly modifying the hardware. Software was developed to allow one computer to perform numerous functions, without hardware modifications. Higher-level programming languages were developed to allow programmers to more easily write software. Theoretically, programmers could still develop software by writing object code directly, but this is not realistic. In practice, it is impossible to do so for any non-trivial program.²²⁰ Thus, writing source code is

1998, at 265. Others might read the recipe to learn how to make the soup. Readers might even follow the recipe to make the soup themselves. Readers might also learn about this author’s culinary ideas from the recipe, but these ideas would be better expressed in an essay—or perhaps notes accompanying the recipe. The best way for another cook to review the soup is to eat it. But obviously, the soup is not speech.

215. *City of Dallas v. Stanglin*, 490 U.S. 19, 25 (1989).

216. *Bernstein*, 176 F.3d at 1142.

217. *Id.* at 1140.

218. *Id.* at 1142.

219. *See supra* note 73.

220. Programmers would understandably find it challenging to keep a list of millions of numbers straight in their minds. Modification of the code or alterations to enable running the software on different hardware would be similarly possible in theory and impossible in practice. The dissenting opinion in *Bernstein* argues this point. *See Bernstein*, 176 F.3d at 1147 (Nelson, J., dissenting). “Software engineers generally do not create software in object code . . . because it would be enormously difficult, cumbersome and time-consuming.” *Id.*

how people allow a computer to function as several different machines.

Because it is difficult to conceptualize what cannot be easily observed, an analogy to a simple machine is instructive. As noted above, an algorithm is a method for solving a problem. Source code implements the algorithm, making it functional. A compiler creates object code from source code. Object code, in turn, operates a computer.²²¹ Similarly, the making of a mold is a way to form a material into a particular shape. The design specifications for a mold are analogous to the algorithm. The mold itself is analogous to the source code, as it is what allows for the making of and sets out the parameters of the end product. The end product, the molded shape, is analogous to the object code. *Bernstein* made much of the fact that source code must be compiled by a machine before it can operate a computer,²²² but this is also true for the mold: a machine must do something with the mold to make the end product. The apparatus that fills the mold with material is analogous to the compiler. Just as one does not need to know how the mold was constructed to operate this apparatus, one does not need to know how source code was designed to compile it.

Obviously, source code is very different from a physical mold. The differences are, however, in the type of engineering involved, not the fact that engineering is present. Like the mold, source code is simply a way to make something. It just does so in a much more technical way that is difficult for most people who do not write source code, including lawyers and judges, to understand. Neither the mold nor the source code is speech.

Third, implications of *Bernstein's* holding expose flaws inherent in finding source code to be speech. Some of these arise outside of the First Amendment context with regard to intellectual property law.²²³ In the free speech context, the reasoning of the *Bernstein* opinion, if logically extended, would allow the First Amendment to apply to a wide range of activities to which it has not previously been applicable. In particular, with regard to scientific research and invention, the case suggests that the products of one's work are entitled to First Amendment protection as much as papers or lectures discussing them. If a

221. See *supra* notes 73-79 and accompanying text.

222. See *Bernstein*, 176 F.3d at 1140.

223. See generally Burk, *supra* note 162 (discussing myriad potentially problematic consequences to copyright and patent law).

scientist develops a nuclear weapon, her specifications are speech.²²⁴ If she were to construct a component of the weapon based upon her specifications, the component would be an excellent way for others in the field to understand it, provide feedback on it, and otherwise engage in discourse about her ideas about it. The construction itself, however, is not speech.

Another scientist might be working on a cure for cancer rather than making bombs. This scientist genetically engineers mice. He would like not just to write or talk about his research, experiments, and findings, but demonstrate his mice themselves and their properties to professional colleagues. The genetically-engineered mice are no more speech than the bomb, although much of the logic of the *Bernstein* opinion would make them so. Likewise, source code, although not a completed software product, is distinct from the mathematical algorithms it implements.²²⁵ The algorithms, as the *Bernstein* court notes, are surely entitled to First Amendment protection.²²⁶ However, a clear line can be drawn at source code.²²⁷ In finding encryption software source code to be speech, *Bernstein* does not draw a principled line between what is speech and what is not.

2. The Export Regulations Do Not Abridge the Freedom of Speech by Restricting Source Code

Because source code is not speech under the First Amendment, asking if the export regulations abridge the freedom of speech by restricting source code is an inappropriate question. This point seems obvious, but *Junger's* analysis suggests it might not be so apparent.²²⁸ This is not to say that the regulations are wise or useful, only that they do not violate the First Amendment by virtue of their restrictions on source code itself.

224. Her specifications, though speech, would likely be unprotected speech, like fighting words. Because of national security, the government would also likely be able to restrict the distribution of the specifications without violating the Constitution.

225. See *supra* note 79.

226. See *Bernstein*, 176 F.3d at 1141 ("If the government required that mathematicians obtain a prepublication license prior to publishing material that included mathematical equations, we have no doubt that such a regime would be subject to scrutiny as a prior restraint.")

227. See *supra* note 79. The line between what is speech and what is not can be drawn between the algorithm and the source code.

228. See *supra* Part II.A.2 (discussing the abridgement analysis in *Bernstein*, *Junger*, and *Karn*).

Indeed, given that people can easily generate electronic source code by scanning or retyping printed source code, it is difficult to see how the regulations could be effective. Moreover, although this Note concludes that source code is not speech under the First Amendment, the development of software is nonetheless critical for much scientific research in certain fields, and the regulations may thus chill related technological advancement.²²⁹

3. Encryption Software May Allow for Speech Protected by the First Amendment

Although source code itself is not speech under the First Amendment, encryption software may nonetheless be entitled to some free speech protection. The freedom of speech protects activities that provide for speech. For example, newspaper racks are not themselves speech, but the government's regulation of them may abridge the freedom of speech as a prior restraint.²³⁰ Likewise, encryption software allows for concealed electronic communication, and the freedom of speech may include the right to speak confidentially.²³¹ Because of the significant role that electronic communication and transfer of information play in many people's lives, the ability to protect its privacy is critically important.

In a recent case, the District of Columbia Circuit Court evaluated a First Amendment challenge to a law that prohibits the intentional interception of wire, oral, and electronic communications.²³² In finding no violation of the freedom of speech, the court emphasized that the government's purpose was not only censorial, but actually intended to promote the

229. Some commentators have proposed that the First Amendment protects the right to research. See, e.g., Richard Delgado & David R. Millen, *God, Galileo, and Government: Toward Constitutional Protection for Scientific Inquiry*, 53 WASH. L. REV. 349 (1978); John A. Robertson, *The Scientist's Right to Research: A Constitutional Analysis*, 51 S. CAL. L. REV. 1203 (1977). Such a right would still not necessarily mean that Bernstein could post his source code on the Internet, given that the posting is not the research itself. Such a right would also not mean that the source code itself is speech.

230. See *supra* notes 58-61 and accompanying text (discussing prior restraints).

231. See *supra* note 43 and accompanying text; see also *supra* Part I.C (discussing encryption software).

232. See *Boehner v. McDermott*, 191 F.3d 463, 464 (D.C. Cir. 1999) (holding that "an individual [giving] a newspaper the tape recording of a cellular telephone call he received from the criminals who conducted the illegal eavesdropping" is not part of the freedom of speech).

freedom of speech by protecting private communication.²³³ With regulations of encryption software this reasoning cuts the other way, and suggests that the government's purpose is related to deterring the freedom of speech by limiting avenues for protecting its privacy.²³⁴ For these reasons, although this free speech approach is not the focus of this Note, encryption software's specific function may be what implicates the First Amendment. More broadly, it is the function of particular software—what it does—that may entitle it to free speech protection.

CONCLUSION

Whether encryption software source code is protected under the First Amendment is sure to remain an issue. The Clinton administration continues to modify and relax the export regulations of encryption software, but people will likely continue to challenge remaining restrictions on free speech grounds. Moreover, the broader issue of whether source code is speech will arise in other contexts, particularly given *Bernstein's* novel initial holding by an influential court. Although people write source code in languages and source code's use may implicate free speech values, it is not the protected expression of an idea, but the unprotected implementation thereof. Encryption software, in particular, may be entitled to some First Amendment protection, but source code itself is not speech under the First Amendment.

233. *See id.*

234. The Ninth Circuit also noted this function of encryption software and suggested that the government's regulations, by retarding the development of encryption, may implicate the Fourth Amendment search and seizure right. *See Bernstein v. United States Dep't of Justice*, 176 F.3d 1132, 1145-46, *reh'g granted*, 192 F.3d 1308 (9th Cir. 1999).

