

Software Ethics Course Proposal

(Technical Paper)

Evaluating Controversy in the EARN IT Bill

(STS Proposal)

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On my honor as a University student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments.

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Introduction

Software is rapidly evolving, and the near ubiquitous use of devices that require some sort of software means that any design choice has serious and widespread consequences. Often, different requirements (or larger design philosophies) for software could be in direct conflict with one another. It's an important topic to consider, and one I hope to analyze and address through the technical and research topics. The technical topic speaks to designing a course at UVA, specifically for CS majors and those who may be heavily involved in software design, with the intent of getting students to think about these things, and consider and develop their own arguments. The STS topic analyzes the controversy behind a (as of October 18th, 2020) bill making its way through Congress that tech advocates see as a threat to privacy.

Technical Topic: Software Ethics Course at UVA

The technical project will attempt to design a course that addresses controversies within the computer science field, especially as they pertain to the struggle between privacy and law enforcement. The ultimate goal of the course would be to develop CS students' thoughts and consideration of software design and its implications. Through case studies of various prominent situations where ethics of software design come into play, students will have the opportunity to develop their own arguments for particular design choices in software or ethical controversies that pertain to computer science. While there are STS classes that address ethical controversies and help develop this thought process within engineering students, I believe that the relatively young nature of computer science as an engineering discipline, combined with the relatively fast-paced development of new software technologies and the relative lag in regulation and other codified forms of morals and ethics, warrant a special class to focus on ethical issues in computer science.

There are many possible case studies that could be reviewed in the class, and all may highlight different controversies in computer science. For example, the Equifax data breach, where a small vulnerability in an outdated software put nearly 143 million people's sensitive financial information at risk (Newman, 2017). This could bring up a question of how to balance the need to keep software up-to-date with the costs of moving a cumbersome application onto a new component. Looking at SOPA and PIPA, where another large interest group (in this case, copyright advocates) tried to enact a law that would have broken a crucial component of the way the Internet currently functions. For this, it could answer the question of how to balance different (and conflicting) special interest groups.

STS Research Topic: Evaluating Controversy in the EARN IT Bill

Technology, especially in the field of computer science and cybersecurity, is rapidly evolving and progressing, often faster than regulation can keep up with it. Additionally, cybersecurity technologies could be considered "amoral," where the moral "good" in a technology lies more in its use case, rather than any inherent characteristic. For example, end-to-end encryption, which allows for secure, private communication between two parties, can host anything from the benign, such as instant messages between friends, to critical, such as financial transactions, to criminal, such as child pornography or human trafficking. Undermining or supporting encryption will have effects on all three categories unilaterally. The Eliminate Abusive and Rampant Negligence of Interactive Technologies Act of 2020, or EARN IT Act, seeks to combat the spread of child sex abuse, grooming, trafficking, etc., generalized as "child sexual abuse material." (Graham, 2020). The STS research topic seeks examine the various sociotechnical factors that influence the various viewpoints that either support or oppose the bill.

Analyzing the many views present in this discussion over the EARN IT Act can best be viewed through the framework of co-production, specifically co-production of science and social order. Co-production, according to Sheila Jasanoff, is the notion that science and society are intertwined, that is, that science and technology are “indispensable elements in the process of societal evolution” (Jasanoff, 2004, p. 17). The most useful form of co-productionist analysis focuses in on controversy, where ideas compete for supremacy (Jasanoff, p. 5, 2004). Brian Martin and Eveleen Richards (1995) suggest a more specific approach to controversy, viewing it as “a process of conflict and compromise involving various groups contending in a political marketplace” (p. 511).

End-to-end encryption, one of the technologies viewed as under attack by the EARN IT Act, is a technology that allows for secure communication between two parties, with little fear of an intercepted message being deciphered. This is achieved through distortion of the data by some mathematical manipulation in a way that only the sender and receiver can understand. Any intercepted message would theoretically be prohibitively computationally expensive to decipher, meaning that any party, even governments, would not be able to draw useful information from this garbled data. The only feasible ways to decipher this would be to conduct what is known as a “man in the middle” attack, where the attacker imitates one of the parties, relaying messages sent between the intended two parties, or by leveraging some present backdoor. The strong security of this technology is seen by privacy advocates as a way of forcing governments to conduct “a more targeted, constitutional form of intelligence gathering” (Perlroth 2019).

The EARN IT Act seeks to develop “best practices” that tech companies must follow, with the intent to “prevent, reduce, and respond to the online sexual exploitation of children” (Graham Sec 3(b), 2020). This is done by establishing a committee of 19 members, including the

Attorney General and the heads of the Department of Homeland Security and Federal Trade Commission. Additionally, 4 members must be of a computer science background, and 4 members must have non-governmental experience with or be victims of online child sexual exploitation (Pfefferkorn, 2020). This committee is responsible for determining these best practices, and these are enforced by allowing for companies to have liability exemptions if these best practices are being followed (Newman, 2020).

Both privacy advocates and encryption advocates see the EARN IT Act as a direct threat to end-to-end encryption. While the bill does not explicitly undermine end-to-end encryption, encryption advocates see that the committee method of producing these “best practices” could end up involving some form of broad surveillance of content across the service, which cannot be met with a service that uses end-to-end encryption. Companies such as Facebook argue that they are able to “adequately identify child predation threats without eliminating or undermining user data protections like end-to-end encryption” (Newman, 2020). Additionally, this possible undermining of end-to-end encryption is seen as a massive security vulnerability, where “no backdoor could guarantee only law-abiding officials have access” (ACLU and AFP, 2020). The ACLU and AFP also argue that this backdoor could be abused in a way that, ironically, could lead to more abuse and exploitation.

Privacy advocates also see this undermining of encryption as a violation of basic freedoms. Since the EARN IT Act could feasibly allow for the government to monitor and regulate the type of content online service providers host, constituting a violation of basic 1st amendment rights. Additionally, considering the act could also allow for a government backdoor into any encrypted service, advocates have interpreted this as a violation of 4th amendment rights, since the government could “search users’ accounts without a warrant based on probable

cause” (Cope, Mackey, and Crocker, 2020). While they condemn child sexual abuse material unilaterally and wholeheartedly, they see the potential risk to a larger group as more important to consider.

On the other side of the argument, supporters of the EARN IT Act see the encryption threats as overblown, pointing to the presence of tech experts on the committee where best practices are established (“What the EARN IT Act Does,” 2020). They have also pointed to the bureaucratic structure by which best practices are “passed,” seeing that it will have to pass by officials in organizations that have had a history of support for encryption (Rozenshtein, 2020).

Martin and Richards’ explanation of the group politics approach, which they argue “works well when a dispute is active” (p. 512), to analyzing co-productive controversies can help shed much light on this situation. This framework helps draw focus towards the various groups that are involved in the dispute, as well as what power and resources they can utilize towards their advantage (Martin and Richards, p. 512). In the case of supporters, the most prominent supporters would be the members of Congress responsible for the bill. For them, they are able to motivate their voter base, as well as other members of Congress. Opposition to the bill, especially with no alternative, can be seen as hugely unpopular (Pfefferkorn, 2020). Advocates for child sex trafficking (that is, those specially interested in the prevention of child sex trafficking) can motivate their peers, seeing this bill as a massive victory over child sex exploitation. On the opposite side, technology companies who oppose this bill can motivate their user base, using strong language to paint a bleak picture of the risks that may stem from any possible invasion of privacy or undermining of encryption. Additionally, technology companies may be able to motivate the general public by leveraging the Internet, similar to what was seen with the SOPA/PIPA blackout.

Martin and Richards' group politics approach to analyzing controversy can also shed light on the future of this act. Closure is defined by "the process by which a dispute ends," and by the group politics definition, requires that both technical and social issues are addressed, and ends with "success by one group...in the political marketplace." (Martin and Richards, 1995, p. 522) Analysis tends to look for a "diverse range of inputs," later described as a "marketplace of ideas" ensures easiest and best way to resolve a conflict (Martin and Richards, 1995, p. 522). Applying this to the EARN IT Act, we see that the "marketplace" has already developed, as multitudes of people have written articles (some of which formed source material for this paper) voicing their opinions on the social and technical controversies. Closure can be essentially be the success of the bill. If the bill becomes law, this represents a victory for those who saw the bill as a victory against child sex exploitation. If the bill fails to become law, it can be seen as a victory for the technology companies and privacy advocates. Before this happens, however, the exchange of ideas in the public space will continue.

Conclusion

Analyzing the ethical implications of the bill such as the EARN IT Act through the lens of Coproduction of Science and Social Order sheds some light on the different viewpoints of supporters and opposers to the bill. A class designed to constantly discuss these controversies will help develop UVA computer science graduates into better engineers who can consider these ethical struggles and better argue for their view. Both of these will help further develop (and push towards a resolution) different ethical struggles within the computer science field.

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