

Essay 2

Professional, ethical, legal, security and social issues and responsibilities

Dear student. Consider your project for this quarter. The problem you are working on has multiple professional, ethical, legal, security and social implications. For example, suppose you had written a compression algorithm that allows you to add a password requirement to unzip the file.

We could imagine:

- The FBI finds a suspicious document, compressed and pass-protected with your software. They will not tell you where it came from, but they want your help to crack it. Should you help them?
- You want to give your code away as shareware. But you imagine “*Suppose my software has a bug, and in rare cases it cause hard drives to be wiped!*”. Is there anything you could do to protect yourself from lawsuits? Would you do anything different if you were selling your code, as opposed to giving it away?
- When doing the project you hit upon a new compression algorithm that might be worth millions of dollars. Does the university or the instructor deserve a share of the royalties? Do your teammates deserve any of the royalties?
- How could you stop someone stealing your idea(s) and profiting from them?
- Because of a bug in your code, even when pass protected, hackers can tell the language (English/Spanish etc) of the compressed file(s). Could you imagine scenario in which that could ever be a problem that might expose you to lawsuits?
- Two companies want to buy the rights to use your compression algorithm in an MP3 player. Company **A** will manufacture the devices in California, and they will pay you \$20,000. Company **B** will manufacture the devices in Sri Lanka, and they will pay you \$25,000. Which company do you sell the rights to?
- While your algorithm can compress the files to a smaller size (on average) than the current state-of-the-art compressor, it requires more CPU time. You work out that if your algorithm became as ubiquitous as MP3, it would cause humankind to consume an extra 10,000 megawatts of energy per day (that is about what NY City consumes each day). On the other hand, people would have the convenience on putting at least 100 more songs on their MP3 player...
- After you sell the rights to your algorithm, you realize that you used someone else’s code in a minor subroutine, do you have any obligations to that person?

Given the above text to spur your imagination: Please do any **two** of the following (750 words each): Write an essay describing how your project *does* or *might* have given rise to

(1) an ethical issue, (2) a legal issue, (3) a security issue, (4) a social issue, (5) a professional issue.

If you prefer you may write a single 1,500 word essay that addresses a combination of two or more of the above issues. In addition to describing the potential or actual problem, you can discuss potential solutions.

Hand In: A 1,500-word essay (or two 750-word essays), with five or more cited sources, on the topic(s) discussed above. The essay(s) should be submitted on iLearn as a single PDF file. This is an individual assignment.

Useful Resources

An understanding of professional, ethical, legal, security and social issues and responsibilities

- ACM Software Engineering Code of Ethics and Professional Practice
www.acm.org/about/se-code
- IEEE Code of Ethics www.ieee.org/about/corporate/governance/p7-8.html
- Retraction Watch: Retraction Watch is a blog that reports on retractions of scientific papers retractionwatch.wordpress.com/
- UCR Student Rights and Responsibilities
conduct.ucr.edu/studentRightsResponsibilities/Pages/studentRightsResponsibilities.aspx
- Wendell Wallach and Colin Allen. *Moral Machines: Teaching Robots Right from Wrong*. Oxford University Press

An ability to communicate effectively with a range of audiences

- How to give a good research talk, Simon Peyton Jones, John Launchbury, John Hughes, SIGPLAN Notices 28(11), Nov 1993. (and the references thereof)
- Mathematical Writing, Donald E. Knuth, Tracy Larrabee, and Paul M. Roberts. tex.oria.fr/typographie/mathwriting.pdf
- The Elements of Style: A Style Guide for Writers (2005), by William Strunk.
- The Elements of Style by William Strunk Jr. & How To Speak And Write Correctly, by Joseph Devlin (2006), BN Publishing,

An ability to analyze the local and global impact of computing on individuals, organizations, and society

- Bynum, Terrell, and Simon Rogerson. (1996) *Introduction and Overview: Global Information Ethics*. *Science and Engineering Ethics*, 2 (2): 131-136.
- Spinello and Tavani: pp. 40-54: “*Reason, Relativity, and Responsibility in Computer Ethics*”, by James Moor.
- The \$100,000 Keying Error: Kai A. Olsen,
www.academia.edu/543768/The_100_000_Keying_Error