

# Poulin - AP CSP Summer Work

## Blown to Bits Reading

*Who's watching you, what do they know about you, and what will they do with that knowledge?*

*Is it time to say goodbye forever to privacy and personal identity?*

*What kind of world are we creating, and what will it be like to live there?*

Computing has transformed our lives in so many ways. And mobile computing, where we are constantly connected to others and to the world via our mobile devices, is challenging us right now to come with new norms about privacy, security, the ownership or openness of data and information, and other issues.

Like any technology, mobile computing has both positive and negative impacts. We need to reflect on these impacts in general and we also think about the impacts we will create as we build our own mobile apps.

One way we will be addressing these issues in this course is by reading and discussing *Blown to Bits: Your Life, Liberty, and Happiness After the Digital Explosion*. The book is available entirely online with a separate PDF file for each chapter. You can access the website for the book by clicking the book image to the left.

### **Synopsis**

Wherever you go, whatever you say, write, photograph, or buy, whatever prescriptions you take, or ATM withdrawals you make you are generating information. That information can be captured, digitized, retrieved, and copied, anywhere on Earth, instantly. Sophisticated computers can increasingly uncover meaning in those digital traces, understanding, anticipating, and influencing you as never before.

Is this utopia? Or the dawning of a 1984/Brave New World horror world? Whatever you call it, it's happening. What kind of world are we creating? What will it be like to live there? *Blown to Bits* offers powerful and controversial answers to these questions, and give you the knowledge you need to help shape your own digital future, not let others do it for you. Building on their pioneering joint MIT/Harvard course, the authors reveal how the digital revolution is changing everything, in ways that are stunning even the most informed experts.

You'll discover ten paradoxical truths about digital data, and learn how those truths are overturning centuries-old assumptions about privacy, identity, and personal control.

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You'll view the indelible digital footprints you're making when you search Google, send emails and text messages, write Microsoft Word documents, download MP3s, make cellphone calls, post blog entries, pay highway tolls, use your supermarket discount card. And you'll see how others could be following those footprints, in ways you never thought about, and might not like.

Writing in plain English, the authors illuminate the myriad implications of the digital revolution, answering the questions you've wondered about, or ought to wonder about. Who owns all that data about you? What do they owe you? How private is your medical information? Is it possible to send a truly secure message? Who can you trust for accurate information when traditional media is replaced by thousands of unfiltered Internet sources?

Along the way, they reveal the decisions governments and corporations are making right now that will shape your future, and show how to have your say in those decisions. Because you have an enormous stake in the outcome. We all do.

Blown to Bits: Your Life, Liberty, and Happiness After the Digital Explosion, Hal Abelson, Ken Ledeen, & Harry Lewis. ISBN: 9780132797436. - *.pdf is available free online. Feel free to buy a hard copy if you like.*

- Free Download - <http://www.bitsbook.com/excerpts/>
- Amazon Hardcopy - <https://www.amazon.com/Blown-Bits-Liberty-Happiness-Explosion/dp/0137135599>

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### Chapter 1 - Digital Explosion: Why Is It Happening, and What Is at Stake?

1. What is a bit and what does it mean to say that "it's all just bits"? (Koan 1)  
Give examples of the things today that are stored in bits?
2. Describe, in your own words, Moore's Law.
3. Someone offers you a summer job and offers you two pay rates: (1) \$10 per hour for 40 hours per week for 30 days or (2) One cent on day 1, two cents on day two, four cents on day three and on (doubling each day) for 30 days. If you were trying to make as much money as possible in 30 days, which pay rate would you choose? What does this illustrate?
4. Give an example of how the digital explosion is "neither good nor bad" but has both positive and negative implications.

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### Chapter 2 - Naked in the Sunlight: Privacy Lost, Privacy Abandoned

5. What is an RFID tag and what does it do?
  
  
  
  
  
  
  
  
  
  
6. What is an EDR and what does it do?
  
  
  
  
  
  
  
  
  
  
7. Is it possible to identify someone, perhaps a patient, knowing just his or her gender, birth date, and zip code? Explain.
  
  
  
  
  
  
  
  
  
  
8. What is the difference between "big brotherism" and "little brotherism"?



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14. What are our responsibilities as app developers with data that is gathered from the apps we create?

## Chapter 3 - Ghosts in the Machine: Secrets and Surprises of Electronic Documents

15. What is metadata? Give an example.
16. What is a model?
17. What's the difference between a raster image and an ASCII representation of a text document?

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18. What are filename extensions? What are they used for?
  
19. What is lossless representation? What is lossy representation? What are the trade-offs in using each representation?
  
20. What is steganography and what is it used for?
  
21. What would you have to do to delete a document from your computer so that it could not possibly be read by anyone else?
  
22. How has retouching become a controversial issue? Give an example.

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23. Would you rather own a camera (or camera phone) with a higher number of megapixels or lower? Explain.

24. Other than digital images, what might be an example of a computer model? Explain your answer based on the definition of a model.

## Chapter 4 - Needles in the Haystack: Google and Other brokers in the Bits Bazaar

25. Is Wikipedia considered Web 1.0 or Web 2.0? Explain.

26. Should a researcher place absolute trust in a search engine? Why or why not?

27. "The architecture of human knowledge has changed as a result of search."  
What does this claim mean?

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28. When you type a word or phrase into the Google search engine, what is the search algorithm that is being used? Does Google's search engine search the web? Explain.
  
29. What does it mean to "empty the cache"?
  
30. Think of a number between 1 and 100. If you tell me "too high" or "too low", I can guess the number in 7 guesses. How come? What algorithm makes this possible?
  
31. What is the PageRank algorithm? How does it work?



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### Chapter 5 - Secret Bits: How Codes Became Unbreakable

38. What is encryption?

40. What is security through obscurity and why is it bad?

41. What is the key agreement protocol and why is it so important to Internet commerce?

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42. What is a certificate and what role does it play in Internet security?

43. In your opinion, are digital signatures more secure than handwritten signatures? Explain.

### Chapter 6 - Balance Toppled: Who Owns the Bits?

44. Why should all Internet users be aware of copyrighted material?

45. What is a GB? How many bytes are in GB?

46. What is the NET Act and what is its significance in the history of copyright?

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47. What is a peer-to-peer architecture? Provide an example of at least one well-known peer-to-peer network.

48. What is the DMCA and why is it significant to copyright?

49. What are Open Access and Creative Commons? How have they impacted the sharing of digital information?

50. Before reading this chapter, were you aware of copyright infringement? When you put digital content (e.g. images, videos) in your apps, where did you get it from? Is it possible that you violated any copyright terms?

51. In your opinion, are YouTube users violating copyright terms when they make lyric videos? Why or why not?

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52. In your opinion, are computers that use DRAM violating copyright terms? Why or why not?

Chapter 7 - You Can't Say That on the Internet: Guarding the Frontiers of Digital Expression

53. What is the CDA? Why is it significant to digital censorship?

55. What is the 2005 Violence Against Women and Department of Justice Reauthorization Act? What is its significance?

56. Is it possible for a country or government to censor what its citizens view on the World Wide Web? Why or why not? Provide an example in your answer.

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57. Law professor Eugene Volokh wrote, “The law often demands that we sacrifice some liberty for greater security. Sometimes, though, it takes away our liberty to provide us less security.” Do you agree? Why or why not?
58. On social media sites, individuals sometimes say “This is my page; I can say what I want.” Do you agree? Do you believe that social media provides us with a form of ‘Internet Freedom’?