SIENAcollege
Computer Science

Computer Science 010
Introduction to Computer Applications
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Topic Notes: Digital Rights

Our last topic deals with digital rights: who owns ideas, data, computing and communication infrastructure, and who has the right to use them and how.

Property, Copyright, and Patents

We all have a good notion of property and ownership in common contexts, but the ideas extend beyond the conventional. Consider each of these and think about what limits exist on the ownership rights in each:

- Inanimate objects - *e.g.*, a book, a house, *etc.*
- Animate objects - *e.g.*, forest acreage, a pet, a child
- An animal or plant gene – *e.g.*, RoundUp, Monsanto seeds
- A human gene Can a corporation patent a human gene?
- An idea – *e.g.*, cold fusion, "one-click shopping"

Our concern is more along the lines of *intellectual property*: the legal property rights over creations of the mind, both artistic and commercial.

The idea of *copyright* is central here.

- Copyright is presumptive on original works – your own creations are automatically copyrighted.
- The U.S. Constitution's "Copyright Clause" (Article I, Section 8, Clause 8):

  > To promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries.

- An author of a work has exclusive publication rights for a limited time (50 to 100 years after death of the author).
- Upon expiration of copyright, a work becomes part of the *public domain* – available for anyone to use/publish.

- An exception to copyright is *fair use* – the ability of non-copyright holders to make use of a portion of a work without obtaining permission from the copyright holder. Four factors considered by law in the U.S. to determine fair use:

  1. The purpose and character of the use, including whether such use is of commercial nature or is for nonprofit educational purposes.
  2. The nature of the copyrighted work.
  3. The amount and substantiality of the portion used in relation to the copyrighted work as a whole.
  4. The effect of the use upon the potential market for, or value of, the copyrighted work.

Copyright has always been an important issue, but computer technology has brought the issue to the forefront.

- The cost and ease of copying digital information is low and getting lower.
- The ability to transmit copies is low and getting lower.
- File Sharing when does it violate copyright?
- Can copyright be enforced?
  - *digital rights management (DRM)*: restrict the devices on which the file can be played/displayed/viewed
  - How successful is this approach?

Consider the recent history of the music industry.

- The old model: centralized production of copies
  - LP records/cassette tapes - $8-10
  - CD $15-$18 (big profits!!)
  - business model in 1980s:
    - Signed talent to exclusive contracts
    - Promote and sell music in physical form
  - how could consumers make copies?
- File sharing/download era
  - digital copies of music (from CDs originally)
  - 1999: Napster (a client-server system) allows music search, file sharing
  - 2001: Recording Industry Association of America (RIAA) sues Napster

  - More recently: P2P file sharing, *e.g.*, BitTorrent, The Pirate Bay

- 2001: Apple changes the game with iTunes
  - Music industry is on board as a partner
  - DRM to limit copying
  - iTunes is popular and hence has great power with music distributors: they need to be on board
  - 2009: DRM-free iTunes music

All of this has fundamentally changed how the music industry does business.

Digital Rights Management

The primary purpose of DRM is to restrict the copying of digital data.

This approach has been used on movies, music, games, ebooks.

Patents

Patents are sxclusive rights granted by the state to an inventor for a limited period in exchange for disclosure of an invention.

- Usually 20 years of control
- Provides incentive for research and development
- Software patents
  - Basis for software license fees
  - Free Software License GNU GPL: a “copyleft”
  - Royalty-free patents patents in public domain

Your Rights in a Digital World

One of the most important concerns when using digital technologies is the ability to maintain some *privacy*.

You read about Facebook and the levels of privacy or lack thereof that exist there.

You may ask: why should I be concerned about privacy if I have nothing to hide? Would you want this information out of your control?

- income tax forms, other financial records

- education records
- court and legal records
- medical records

How private are these? Who decides if they're private or public record? Let's look at a few:

- Who owns your credit records? Who can get access?
- Who owns your health records? Who can get access?
  - Health Insurance Portability and Accountability Act of 1996 (HIPAA)
- Who owns your online profiles? What control do you have over it?
- In Europe: EU Data Protection Directive
  - explicitly addresses privacy and ownership of personal data
- Is privacy a constitutional right?

Control

With the Internet becoming such an important part of everyday life, it is important to think about who "owns" the Internet and who has the right to use it and how.

First, who has the right to put information on the Internet and who has the right to retrieve it. Anyone, right?

Consider the "Great Firewall of China".

- Extensive government control over the Internet within communist China: content filters.
- Assisted by companies: if they want access to the growth market they have to play by the government's rules
  - special China Google index: filter "inappropriate" sites
  - exception: IP addresses at Beijing Olympics
- Mandatory client on all computers to "protect the young"

Why should we care?

- Could it happen here? Is it?

- Consider: impact of the Internet on recent Iranian protests

So in what circumstances is is appropriate for a government to:

- Block “bad” sites from citizens.
- Search email and blogs for “bad” or “dangerous” speech.
- Maintain profiles of citizens’ browsing history.
- Edit blogs/wikis to promote a positive view of the political leadership.

Who should manage and pay for the Internet?

- Should everyone have access to a broadband connection?
  - Even expensive (rural) people where providing access cannot be profitable?
  - Telephone service: those for whom it is cheap to provide service subsidize those for whom it is expensive.
  - Is the Internet a “lifestyle choice” today or a necessity?
  - Consider the *digital divide*: those who have Internet access and those who don’t
- Should bandwidth usage be free (unlimited)?
- Who should pay? Government? Users? Rely on competition? Regulations?
- Commercial management of routing and traffic prioritization.
  - Should an ISP be able to block or at least slow down competitors’ content?
  - Should an ISP charge for different *Quality of Service (QoS)* tiers? (Pay for priority treatment of your packets)
  - You read about *Network Neutrality*: network access should be neutral (blind) to IP addresses and services – All content and all services are treated equally.
  - Opposing view: the Internet will only continue to grow, be secure, and be innovative if free market forces guide it.

Some final thoughts:

- Be aware of your rights and the rights of others on the Internet.
- Think about privacy before you upload, post, comment, *etc*.in a way that you may not be able to undo.
- Be informed on the political issues involving technology and understand the arguments and consequences.