Cornell University
Computing and Information Science

CS 5150 Software Engineering

22. Legal Aspects of Software Development

William Y. Arms

Legal Environment

Software is developed in a complex **legal** and **economic** framework.

Every software developer needs to be **aware** of parts of the framework.

A senior manager or consultant will frequently work with lawyers.

You **need a lawyer** for anything other than the most basic legal issues.

I am not a lawyer. This lecture is not legal advice.

Sources

It is often useful to read the text of a law.

See: Cornell's Legal Information Institute for the US Code (the actual wording of the law), federal regulations, and much more useful information, http://www.law.cornell.edu/.

- D**o not try to interpret the law**. You may be reading the wrong law, or not know how it has been interpreted by the courts.
- Do not assume that the interpretation by the courts is what you would expect from reading the statutes.

Be very careful about legal advice on web sites. **Much of it is simplistic or wrong.**

Legal Topics in Software Development

In this lecture:

- Jurisdiction (international, federal, state laws)
- Intellectual property (copyright, patents, trade secrets)
- Contracts and licenses
- Privacy (personal information and data mining)

In another lecture:

- Employment (personnel, your next job, etc.)

Not covered:

- Free speech and libel
- Liability, damages, etc.

Statutes and Precedents

The United States follows **Common Law**. The law is a combination of:

- **Statutes** (bills) passed by Congress and the 50 states.
- **Regulations** issued by the government.
- **Precedents** (judgments) made by courts.

Jurisdiction: USA

United States has:

- **Federal law**, which covers the entire USA, with the federal court system headed by the US Supreme Court
- **50 states**, each with its own laws and its own court system

Much of state law that covers computing is **based on** the **Uniform Commercial Code**, but there are many differences between the states.

Jurisdiction: International Law

The relationship between US law and the laws of other countries is complex and changing.

The Internet has no boundary. Any web site can be viewed almost everywhere. Services such as Google, Facebook, and Amazon are available almost worldwide.

Example: a user in country A, is connected via servers in country B, to a service in country C. Each country may claim jurisdiction over the worldwide operations of the company that runs the service.

Intellectual Property Law: Copyright

Copyright is Federal law, which applies to “literary works”.

Originally applied to textual materials, but gradually extended to cover text, music, photographs, designs, software, ...

Copyright applies to the expression of ideas (e.g., the words), not to the ideas themselves, nor to physical items.

Software

Copyright applies to the program instructions, but not to the concepts behind the instructions, nor to the files or printouts of the programs instructions.

Copyright

In the USA, copyright gives the **owner** of a literary work, exclusive right to:

- reproduce or copy
- distribute
- perform or execute in public
- display in public
- license others to reproduce, distribute, perform, or display

Special exceptions (which rarely apply to software)

First sale: The owner of an object, e.g., a book, can sell the object without permission of the copyright owner.

Fair use: Limited use is permitted without permission of the copyright owner, e.g., in a review or short quotation.

[In theory, copyright last for only a period of years, but the period is much longer than the life of any software.]

Ownership of Copyright

Who owns copyright?

Copyright is an example of intellectual property. It has an owner and can be sold or licensed.

At creation

- Copyright is established automatically when a work is created.
- Copyright is automatically owned by the creator.
- There is a major exception, work for hire. If the creator is employed, the employer owns the copyright.
- Special rules apply when the work is created by several people.

Transfer of copyright

- Copyright is intellectual property that can be sold or licensed.
- The agreement to sell copyright is written as a contract.

Copyright and Work for Hire

U. S. Code Title 17

§ 201. Ownership of copyright

(a) Initial Ownership. — Copyright in a work protected under this title vests initially in the author or authors of the work. The authors of a joint work are coowners of copyright in the work.

(b) Works Made for Hire. — In the case of a work made for hire, the employer or other person for whom the work was prepared is considered the author for purposes of this title, and, unless the parties have expressly agreed otherwise in a written instrument signed by them, owns all of the rights comprised in the copyright.

Ownership of Software

- If you are employed, copyright in the code that you write belongs to **your employer** (e.g., if you do paid work for a Cornell department).
- If you work independently and write software for some organization, you must **have a contract** with the organization that is explicit about who owns the copyright in work that you do.
- If you do not own the copyright, you need permission to copy, or use the software, **even if you wrote the code** (e.g., you cannot make a copy for your personal use).

Cornell Copyright

Read the Cornell Copyright Policy:

https://www.dfa.cornell.edu/tools-library/policies/copyright

Cornell's policy is that **you own the copyright** in the work that you do for class. Anybody else, including Cornell or your clients, needs your permission before using the software in any way.

The feasibility study for your project must include a commitment to your clients that they will have extensive rights to the software (either transfer of ownership or a comprehensive license).

CS 5150 Entrepreneurial Projects

If your project is for a start-up company or other entrepreneurial venture, it is essential to agree on ownership of software and sharing of potential rewards as part of the **feasibility study**.

If in any doubt, ask for advice.

Example:

Film: The Social Network

Student Projects

There are two examples of project agreements on the web site. See the page on Projects -> Business Considerations.

Before I put examples of student work on the web site, I need permission from the student authors:

- The student authors own the copyright.
- The Family Educational Rights and Privacy Act give students privacy in the work that they do for courses.

Copyright: Derivative Software

When software is derived from other software:

- Copyright in the new code only is owned by new developer or employer.
- Conditions that apply to old code apply to derived work.

If you write S, which includes code derived from A and B, you cannot copy, use, distribute or license S unless the copyright owners of both A and B give permission.

When creating a software product, you should have documented rights to use everything from which it is derived.

Example:

Python distribution

CS 5150 Course Web Site

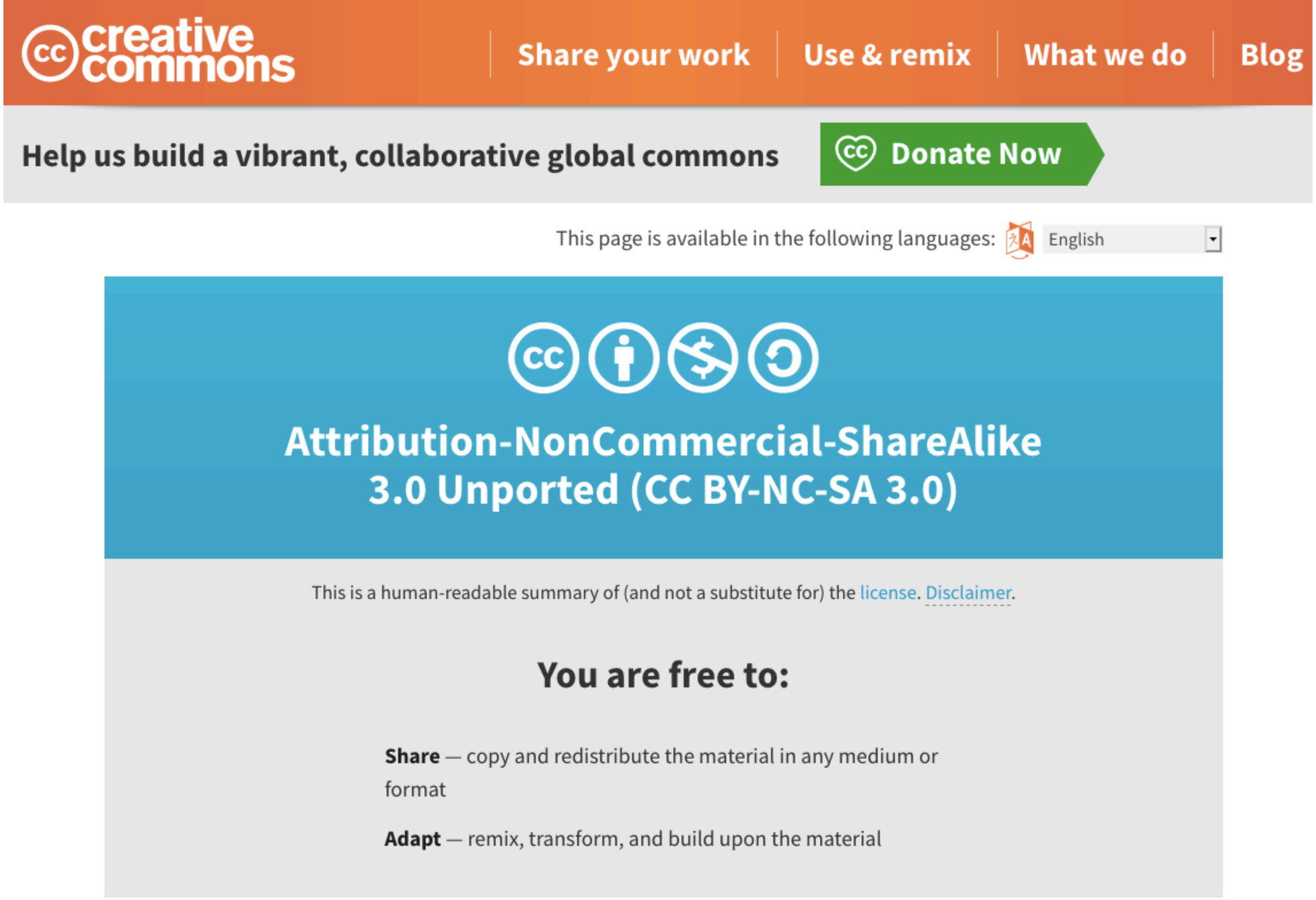
Who has permission to use the materials on the CS 5150 Web site?

Read the About page.

Permission is given to use the materials:

- for non-commercial purposes
- with attribution to the the author

See the Creative Commons license for more details.



http://www.creativecommons.org

Software Contracts and Licenses

Contract

- A contract is a legal agreement about the exchange of goods, services, and money.

  Example: an agreement to sell the ownership of copyright in software.

- An important contract should be a written document signed by both parties.
- For simple agreements, an exchange of letters may be a convenient form of contract.

A contract as a legal document

- A contract is a legal document. If there is a problem, either party can ask a court to resolve it. The court may enforce the contract or use the wording of the contract to resolve the problem in some other way.

Software Contracts and Licenses

Software license

A software license is a contract that permits somebody other than the owner of the copyright to use the software.

Example: license to use Adobe Photoshop.

- The owner retains the copyright.
- Conditions are placed on the use of the software (e.g., number of users, time period, no reverse engineering, etc.)

Click-through agreements are an alternative to a written license. To be legally enforceable, the terms of acceptance must be accessible before the user agrees to the conditions.

Software Contracts

A typical contract might include wording that specifies:

- The software that is covered by the agreement.
- Who owns the software.
- Whether any patents or other intellectual property are involved and who owns them.
- Payment amounts and dates.
- Whether the agreement is permanent or temporary.
- Whether the agreement is exclusive or non-exclusive.
- Terms about contingencies, termination, problems, and difficulties.
- Any other terms and conditions that are agreed by both parties.

Open Source Software

Open source software is an important part of modern computing that does not fit well into contract law.

Examples of open source licenses

BSD license:

A class of extremely simple and very liberal licenses for computer software, originally developed at the University of California at Berkeley (UCB). Often suitable for academic projects.

Apache license:

A permissive license that does not require a derivative work of the software, or modifications to the original, to be distributed using the same license. Widely used, e.g., Android.

GNU public license:

A less permissive license, which requires that derived works can only be distributed under the same license terms, e.g., Linux.

Intellectual Property: Patents

A patent is a form of intellectual property that applies to inventions.

Copyright applies to the expression of ideas, patents to the ideas themselves.

- Should be: non-obvious, novel, and useful.

Patent application

- Public disclosure.
- Complex application procedure to the US Patent and Trademark Office.
- Application is reviewed by patent examiners.
- Patents last 20 years from date of filing the application.

Patent rights

A patent gives its owner the legal right to exclude others from making, using, selling, and importing the invention.

A validity of a patent can be challenged in the patent office or patent court.

Cornell Patent Policy

Cornell's patent policy is different from the copyright policy.

Cornell requires everybody to assign to the university all rights in their inventions.

Read the Cornell Policy on Inventions and Related Property Rights:

https://www.dfa.cornell.edu/tools-library/policies/inventions

If Cornell licenses a patent, the royalties are divided between the university, the inventor, and the inventor's department or unit.

Software Patents

Problems with software patents

- Usually difficult to know where ideas originate.
- Poor quality of patent examiners has lead to broad patents for routine computing concepts.
- There are often hundreds of patents covering essentially the same idea.
- International differences.

Patent Abuse

Because of the huge number of dubious patents that have been granted, companies can often use the threat of patent litigation as a commercial weapon:

- **Large companies** harass smaller competitors to delay the introduction of competing products and to force them into expensive litigation.
- **Patent trolls** are companies whose entire business is to threaten patent litigation. They buy large numbers of patents and extort money from companies whose products use ideas related to the patents.

If you have a senior position in computing you are likely to receive letters threatening patent litigation. If you do, consult a lawyer.

Patents: Recent Developments

The legal framework for software patents is constantly changing.

Definition of what software can be patented

- A 2014 decision by the Supreme Court greatly restricted the range of software that is eligible for patents.
- Subsequent decisions by federal courts interpreted this strictly (to essentially stop all software patents) or less strictly (to allow patents on a wide range of software).

Procedures for challenging the validity of software patents

Recent legislation, which has been confirmed by the Supreme Court, has made the process for challenging a patent more straightforward and much quicker.

Trade Secrets and Non-Disclosure Agreements

Trade secret: confidential business information

Examples

- Specification of a product before it is publicly announced
- Source code of a commercial product

Legal definition

"... information, including a formula, pattern, compilation, program, device, method, technique, or process that derives independent economic value from not being generally known and not being readily ascertainable and is subject to reasonable efforts to maintain secrecy."

Uniform Trade Secrets Act

Non-disclosure agreement

Legal agreement not to disclose trade secrets. It is often reasonable to sign a non-disclosure agreement, but read it carefully before signing.

Trade Secrets

Trade secrets

- Owner must make reasonable efforts to maintain secrecy, e.g., label information “Confidential” and restrict access to designated people.
- A trade secret does not expire, as long as reasonable efforts are made to keep it secret.
- If somebody leaks a trade secret without authorization, it remains a trade secret.
- Competitors may not use secrets obtained through extraordinary means.
- If you learn trade secrets when working for one employer, you must not disclose them to another employer.

Example

If you work for some companies, e.g., Apple, you may be required to sign a non-disclosure agreement that prevents you telling anybody even what project you are working on.

Privacy

Computer systems often gather information that an individual would want to be private.

- What information can you collect (legally and ethically)?
- How should you store it?
- Whom can you share it with?
- When should you destroy it?

The legal framework for privacy that developed before the Internet has proved inadequate for online information. The laws and social norms about privacy are changing rapidly.

Private Information

Types of information

- Specific facts. US privacy law has historically focussed on specific facts.

  Person A used Google to search for Topic B.

- Metadata. Data about information may itself be private.

  An email message was sent from Address A to Address B.

- Aggregate information. Even if the system does not store their names, the intersection of several items of data will often identify individuals.

  A person is married, lives on Hanshaw Road, has a blue Subaru, and works for Cornell.

The Internet and large-scale data mining have made all these categories of information important.

The borderline between appropriate data mining and illegal invasion of privacy is vague.

Private Information

Special categories of information

There are special laws about several categories of information, including:

- medical information
- information about children
- student records

Invasion of Privacy

In the US, federal law on privacy is mainly precedents from various court cases. Several states have laws that define the right to privacy.

The following are considered invasion of privacy:

- Physical or electronic intrusion into one's private quarters.
- Public disclosure of private facts.
- The publication of facts which place a person in a false light.
- The unauthorized use of a person's name or likeness.

Privacy

Many companies collect huge amounts of personal data as a central part of their business.

- Companies, such as Google and Facebook, collect information that many people would consider private.
- This information is often sold to other companies for use in advertising.

Concerns about the data collected by these companies.

To protect privacy, several states and foreign countries, have passed privacy laws:

- California has a strong privacy act that became law in 2020. It applies to almost any business that operates in California.
- The European Union has strict laws that define rights to privacy, and harsh penalties. Because the Internet is international, these laws have international impact.

Privacy: General Advice

Be very careful about collecting personal data with or without the knowledge of the individual.

Assume that you need permission to share private data with others.

- If you operate in the US and do business in California, follow the California law. It is quite likely that other states will follow California's leadership.
- If you operate beyond the US, you need to observe the privacy laws in every country where you operate.

Privacy: Security

If you collect private information, you must store it securely.

Private data is a target for hackers. Security leaks of private data lead to many problems:

- Identification data can be used for fraud, e.g., social security numbers, credit card data.
- Personal data can be use for abuse, e.g., racial profiling, blackmail, etc.

A security leak of private information is a serious problem.

- As a software developer, report it to senior management, immediately.
- As a senior manager, begin damage control quickly and vigorously.

Privacy in the Workplace

Work-related material on your work computer is definitely not private.

Some organizations, e.g., many universities, treat private material on business machines as private, but this is not the law.

Privacy in Email

Privacy in email.

There is an expectation of privacy while an email travels over the Internet, but your email at the mail server is not private, whether you have read it or not.

- Businesses can and will read email to and from their staff.
- Mail providers, e.g., Gmail, read email to build profiles of their users.

Never send anything by email that you would not be prepared for your employer to see.

Email is considered business communication.

- Deleting email can be ruled intentionally destroying company records.
- Email is frequently used as evidence in legal disputes.

Never send anything by email that you would not be prepared to be seen as evidence in a court of law.

Private Information

Private information

As a software developer, and particularly if you work as a system administrator, you may come across private information, e.g.,

- Personal records, such as medical records, financial information, etc.
- Information about dishonest, immoral, or illegal activities
- Corporate secrets

General rule: keep the information private.

If in doubt, e.g., the information implies serious criminal activities, tell your supervisor or a senior manager.

Do not take action yourself.

Conclusion

Conclusion

The aim of this lecture is to help you understand some of the law that applies to software development. It does not cover all topics and leaves out most of the details.

Be aware of the law, but do not pretend to be a lawyer.

I am not a lawyer and this lecture is not legal advice.

Use a professional for:

- Contracts and licenses (unless a very simple exchange of letters)
- Troubles (complaints, injunctions, subpoenas, etc.)

If in doubt, consult your supervisor or a senior manager.

When you become a senior manager, make use of your organization's lawyers.

Cornell University
Computing and Information Science

CS 5150 Software Engineering

22. Legal Aspects of Software Development

End of Lecture