

School of

Engineering and Computer Science

Te Kura Mātai Pūkaha, Pūrorohiko

CYBR 171 T1 2023

Ngā whakapūtanga o Te Haumaruru rorohiko Cybersecurity Fundamentals

Week 11 - Ethical and Legal Aspects

Based on Chapter 19 of the “Computer Security: Principles and Practice” by William Stallings and Lawrie Brown

Objectives

- By the end of this lecture, you should be able to:
 - Discuss different types of computer crimes.
 - Understand the types of intellectual property.
 - Understand the key issues in the area of privacy.
 - Compare various approaches to codifying computer ethics.

Ethics vs Law

Q: What's the difference between a **legal issue** and an **ethical issue**?

- How do you determine which it is?
- Should you care which it is?
- What percentage of your time would you guess that you will spend dealing with **ethical** or **legal** issues?



Ethics vs Law (cont.)

Ethics	Law
Users determine the course of action	Determination is made by others
As a guideline to computer users	As a rule to control computer users
Users are free to follow or ignore	Users must follow the regulations and law
Universal , can be applied anywhere	Depend on the country and state
To produce ethical computer users	To prevent misuse of computers
Not following ethics => immoral	Not obeying laws => crime

- The **law** does not make it “**right**”
- Being “**right**” does not make it **legal**



CYBERCRIME & COMPUTER CRIME



What is it?

*“Computer crime, or cybercrime, is a term used broadly to describe criminal activity in which computers or computer networks are **a tool, a target, or a place of criminal activity.**”*

— From the New York Law School Course on Cybercrime, Cyberterrorism, and Digital Law Enforcement

- These categories are not exclusive
- Cybercrime vs. Computer crime!

Law Enforcement Challenges



<https://www.pandasecurity.com/en/mediacenter/panda-security/types-of-cybercrime/>

- The deterrent effect of law enforcement on computer and network attacks **correlates** with the success rate of criminal **arrest** and **prosecution**
- Law enforcement agency **difficulties**:
 - Lack of investigators **knowledgeable** and **experienced** in dealing with this kind of crime
 - Required **technology** may be beyond their budget
 - The **global nature** of cybercrime
 - **Lack of collaboration** and cooperation with remote law enforcement agencies
- Convention on Cybercrime introduces a common **terminology** for crimes and a **framework** for harmonizing laws globally

Cybercriminals

- The **lack of success** in bringing cybercriminals to justice has **led to** an increase in their *numbers, boldness*, and the *global scale* of their operations
- Are difficult to profile
- Tend to be young and very computer-savvy
- Range of behavioural characteristics is wide
- No cybercriminal **databases** exist that can point to likely suspects



<https://www.pandasecurity.com/en/media-center/panda-security/types-of-cybercrime/>

Cybercrime victims

- Are influenced by the success of cybercriminals and the lack of success of law enforcement
- Many of these organisations **have not invested** sufficiently in **technical**, **physical**, and **human-factor** resources to prevent attacks
- **Reporting rates** tend to be low because of
 - a lack of **confidence** in law enforcement,
 - concern about corporate **reputation**, and
 - a concern about **civil liability**

Working with law enforcement

- Executive management and security administrators need to look upon **law enforcement** as another **resource** and **tool** alongside technical, physical and human-factors resources.
 - The successful use of law enforcement depends on **people skills** more than **technical skills**
- Management needs to understand:
 - the criminal investigation **process**,
 - the **inputs** that investigators need, and
 - the ways in which the **victim can contribute** positively to the investigation



INTELLECTUAL PROPERTY (IP)



Types of property and Intellectual Property (IP)

- Three primarily types of **property**:

- **Real** property
- **Personal** property
- **Intellectual** property

Any **intangible** assets that consists of human **knowledge** and **ideas**.



- Main types of **IP** for which legal protection against **infringement** is available:

- **Copyrights**: unauthorised use
- **Patents**: unauthorised making, using, or selling
- **Trademarks**: unauthorised use or colourable imitation



Copyright

- Protects **tangible** or **fixed** expression of an idea but not the idea itself
- Creator can claim and file copyright at a national government copyright office if:
 - Proposed work is **original**
 - Creator has put original idea in **concrete** form
- Examples: literary works, musical works, dramatic works...



Copyright rights

- Copyright owner has these exclusive rights, protected against **infringement**:
 - Reproduction right
 - Modification right
 - Distribution right
 - Public-performance right
 - Public-display right



Patent

- Grant a property right to the inventor
- “*The right to exclude others from making, using, offering for sale, or selling” the invention in the United States or “importing” the invention into the United States*
- Types:
 - **Utility**: Any new and useful process, machine, article of manufacture, or composition of matter
 - **Design**: New, original, and ornamental design for an article of manufacture
 - **Plant**: Discovers and asexually reproduces any distinct and new variety of plant



Trademark

- A *word, name, symbol, or device*
- Used in trade with goods
- Indicates **source** of goods
- **Distinguishes** them from goods of others
- Trademark **rights** may be used to:
 - Prevent others from using a confusingly similar mark
 - **But** not to prevent others from
 - **making** the same goods, or
 - **selling** the same goods or services under a clearly different mark



IP relevant to **network** and **computer** security

- **Software**
 - Programs produced by vendors of commercial software
 - Shareware
 - Proprietary software created by an organization for internal use
 - Software produced by individuals
- **Databases:** Data that is collected and organized in such a fashion that it has potential commercial value
- **Digital content:** Includes audio and video files, multimedia courseware, Web site content, and any other original digital work
- **Algorithm:** An example of a patentable algorithm is the RSA public-key cryptosystem

U.S. Digital Millennium Copyright Act (DMCA)

- Signed into law in 1998
- Implements WIPO treaties (1996) to **strengthen protections** of digital copyrighted materials
- Encourages copyright owners to use **technological measures** to protect their copyrighted works
 - Measures that **prevent access** to the work
 - Measures that **prevent copying** of the work
- Prohibits attempts to bypass the measures
 - Both **criminal** and **civil** penalties apply to attempts to circumvent
 - Example: unauthorised decryption



<https://copyrightalliance.org/trending-topics/dmca-hearings-and-legislative-reform/>

DMCA exemptions

- Certain actions are **exempted** from the provisions of the DMCA and other copyright laws including:
 - Fair use
 - Reverse engineering
 - Encryption research
 - Security testing
 - Personal privacy
- Considerable concern exists that DMCA **inhibits** legitimate security and encryption research
 - Feel that innovation and academic freedom is stifled, and **open-source software** development is threatened

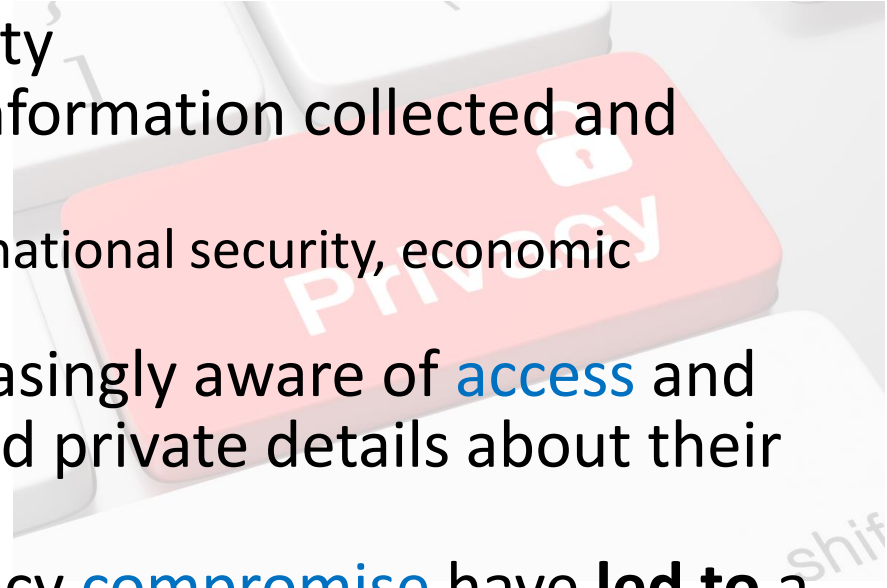


PRIVACY



Privacy

- Overlaps with computer security
- Dramatic increase in scale of information collected and stored
 - Motivated by law enforcement, national security, economic incentives
- Individuals have become increasingly aware of **access** and use of **personal information** and private details about their lives
- Concerns about extent of privacy **compromise** have **led to** a variety of **legal** and **technical** approaches to reinforcing privacy rights



Privacy law and regulation

- European Union (EU) Directive on Data Protection
 - Adopted in 1998 to:
 1. **Ensure** member states protect fundamental privacy rights **when processing personal information**
 2. **Prevent** member states from **restricting** the free flow of personal information within EU
 - Organized around principles of:
 - Notice
 - Consent
 - Consistency
 - Access
 - Security
 - Onward transfer
 - Enforcement

Privacy law and regulation (cont.)

- United States Privacy Initiatives
- Privacy Act 1974
 - Deals with personal information collected and used by federal agencies
 - Permits individuals to **determine** records kept
 - Permits individuals to **forbid** records being used for other purposes
 - Permits individuals to **obtain access** to records and to correct and amend records as appropriate
 - Ensures **agencies** properly collect, maintain, and use personal information
 - Creates a **private right** of action for individuals
- Also have a range of other privacy laws



ETHICAL ISSUES



Ethical Issues

- **Ethics** “refers to a **system** of **moral principles** that relates to the **benefits** and **harms** of particular actions, and to the rightness and wrongness of motives and ends of those actions.”
- Many potential **misuses** and **abuses** of information and electronic communication that create privacy and security problems
- Basic ethical principles developed by civilizations apply, **HOWEVER**
 - Unique considerations surrounding computers and information systems
 - **Scale** of activities not possible before
 - **Creation** of new types of entities for which **no agreed ethical rules** have previously been formed (databases, web browsers, cookies, and chat rooms)

Ethical issues related to computer and information systems

- Some ethical issues from computer use:
 - Repositories and processors of information
 - Producers of **new** forms and types of **assets**
 - Instruments of acts
 - Symbols of intimidation and deception



<https://www.michiganstateuniversityonline.com/resources/leadership/common-ethical-issues-in-the-workplace/>

- Those who understand, exploit technology, and have access permission, have power over these

Professional/Ethical responsibilities



- Concern with **balancing** professional responsibilities with ethical or moral responsibilities
- Types of ethical areas a computing or information system professional may face:
 - Ethical duty as a professional may come into **conflict** with loyalty to employer “**Blowing the whistle**”
 - Expose a situation that can harm the public or a company’s customers
 - Potential conflict of interest

Ethical codes of conduct

- Ethics cannot be reduced to **precise** laws or sets of facts
- Many areas may present ethical **ambiguity**
- Many professional societies have adopted ethical codes of conduct which can:
 - Be a positive stimulus and instill confidence
 - Be educational
 - Provide a measure of support
 - Be a means of deterrence and discipline
 - Enhance the profession's public image



<https://www.corporatecomplianceinsights.com/typical-weaknesses-of-codes-of-conduct/>

Ethical codes common themes

- Dignity and worth of other people
- Personal integrity and honesty
- Responsibility for work
- Confidentiality of information
- Public safety, health, and welfare
- Participation in professional societies to improve standards of the profession
- The notion that public knowledge and access to technology is equivalent to social power



<https://www.ieee.org/about/corporate/governance/p7-8.html>



<https://www.acm.org/code-of-ethics>



<https://sites.google.com/a/gmatc.matc.edu/aitp/code-of-ethics>

The Rules

- Collaborative effort to develop a **short list** of **guidelines** on the ethics of developing computer systems
- Ad Hoc Committee on Responsible Computing
 - **Anyone** can join this committee and suggest changes to the guidelines
 - Published a document entitled *Moral Responsibility for Computing Artifacts*
 - Generally referred to as **The Rules**
 - The Rules apply to software that is commercial, free, open source, recreational, an academic exercise or a research tool
 - Computing artifact
 - Any artifact that includes an executing computer program
- Compared to the **codes** of ethics, **The Rules** are
 - Few in number, and
 - General in nature



END OF LECTURE. THANK YOU.