INFO5990: Professional Practice in IT

Week 11: Ethics

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"Ethics is knowing the difference between what you have a right to do and what is right to do".

Potter Stewart

"Relativity applies to physics, not to ethics".

Albert Einstein

Ethics

- Do you know right from wrong? Always?
    - How do you decide?
    - What do you do about it?
    - Is it different in the workplace to in your personal life?

- How do you judge other people/ companies/ groups ethics?
    - What happens when your 'wrong' is someone else's 'right'?

- Today:
    - Theories
    - Scenarios
    - Case Studies
    - A broader look at ethics in Information Technology

Ethics in professional life

- Boss who arranges for company to employ their relatives, lovers etc.

- Manager who fires staff who complain about wages

- Lawyer who writes a will for elderly client, in which money is left to a charity the lawyer cares about

- Banker who recommends customer borrow money to invest, with commission paid to the advisor

- Doctor who prescribes medicines made by a company that paid for doctor to attend a conference

What do we need to consider as IT professionals?

- What ethical dilemma do you think you will face as an IT professional?

- Discuss ...

.. But specifically for IT professionals?

- How does this apply to IT professionals any differently to our daily lives?

Facebook has a new process for discussing ethics. But is it ethical?

How does Facebook translate broad ethical values into its decision-making process for research?

Home › Responsible Travel › Is Airbnb Unethical And Irresponsible?

Is Airbnb Unethical And Irresponsible?

Posted on October 23, 2017 by Bemused Backpacker — 30 Comments

Everything We Know About Facebook's Secret Mood Manipulation Experiment

It was probably legal. But was it ethical?

BUSINESS October 24, 2017

Why Is Uber Still Having So Much Trouble with Its Ethics?

Cambridge Analytica

Examples of unethical behaviour in IT?

- – copying software illegally (piracy)
- – disclosing personal information
- – failing to give proper advice to boss
- – using company assets for private purpose
- – using privileged position to gain favour
- – failing to take due care with data security
- – failing to treat colleagues or seniors with respect
- – writing code that you know is flawed
- – ... (what else?)

What would you do?

- You work for a small company, Googalzon Consultants. The company's only contract at present is a $6M year-long project for Bluestone Mining to write a software system to analyse geological data.
- You discover a way of designing the system that means that the project can be completed in 2 months, rather than 1 year, and at a cost of only $1M.
- Your boss tells you to keep quiet and ignore the "better solution" as they want to keep the team working on the project as long as possible (otherwise he would have to sack most of the staff), and Bluestone has already indicated they are happy to pay the $6M as they believe the project is worth that much.

- What do you do? vote ...

Ethics through the ages

- The Golden Rule: "**So in everything, do unto others what you would have them do to you**". Bible, (Matthew 7:12)

- Similar found in the Talmud, Koran, the Analects of Confucius and Mosaic law: e.g. "**Whatever is hurtful to you, do not do to any other person**".

- "**If an action cannot be taken repeatedly, then it is not right to take at all**". René Descartes (1596-1650)

- "**If an action is not right for everyone to take, it is not right for anyone**". Immanuel Kant (1724- 1804)

So, what are "ethics"

- Etiquette: (not right or wrong)
  - Codes of behaviour and courtesy
  - Failure to observe may lead to embarrassment
- Law:
  - Series of rules that are enforced by the police and the courts
  - Failure to observe these can result in fines or imprisonment
- Morals:
  - Standards of right and wrong generally accepted by a culture or society
  - We develop a system of morals throughout our life
- Personal ethics
  - the set of an individual's own ethical commitments, usually acquired in early home or religious training but often modified by later reflection
- Professional ethics
  - a set of standards adopted by professionals to apply when they are acting in their professional capacity

  - See http://www.diffen.com/difference/Ethics_vs_Morals

Our ethical framework

Examples :
- Don't tell lies,
- Don't frighten little children,
- Don't sleep with brother's wife
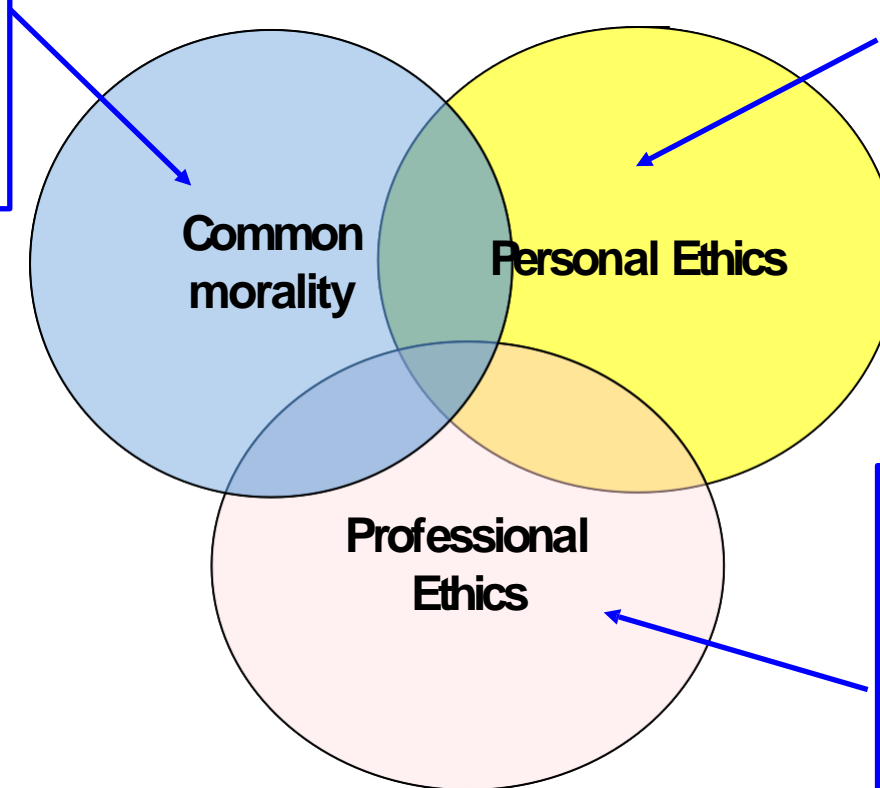
Examples:
- Avoid alcohol,
- Help old ladies across the street,
- Attend church regularly

Common morality

Personal Ethics

Professional Ethics

Examples:
- Keep company secrets,
- Tell the truth in company reports
- Admit a conflict of interest

So, how do we determine what is ethical?

- Ethics is a branch of philosophy. Whole courses devoted to it.
  - What is right? What is wrong?

- How do undertake ethical reasoning? Frameworks for making judgements...
  - Ethical pluralism
  - Teleological ethics
  - Deontological ethics
  - Egoism
  - Utilitarianism
  - Contractarianism

  - See http://docshare04.docshare.tips/files/18453/184537262.pdf

Teleological & Consequentalist Ethics

- Teleology: Decide on actions based on goal (irrespective of outcome)
- Consequentialism: Decide on action based on outcome
  - Outcome = "State of the World"
  - (But whose world? Yours? Mine?)

- Egoism
  - Value of a state is based on your individual situation
  - ... but think about flow-on effects
  - E.g. how other people will respond, and how that will in turn effect you
    - Stealing is bad *because* it will *result* in me going to jail.

- Utilitarianism
  - Value of a state is based on total situation of all people
  - "Greatest good of the greatest number"
  - Who is included? How are their situations weighted?
  - E.g. Tradeoff between a few people suffering much, vs many people suffering a little
    - Stealing is bad *because* it will *result* in pain for numerous people.

Utilitarianism: what would you do?

- Doctors plan an experiment on a small number of subjects.
- There is a risk that most of them will die, but it may mean that a cure will be found for a disease that will relieve the suffering of millions of people.
- Utilitarianists will approve if they see that the action produces the greatest good for the greatest number of people.

Deontological ethics

- Decide on actions based on duty
  - rather than on determining the consequences in the particular case

- There are many duties, and they often conflict!
- Ross' prima facie duties:
  - Fidelity (promise-keeping, truthfulness)
  - Reparation (recompense for previous wrongs)
  - Gratitude (thankfulness for previous services)
  - Justice (happiness should reflect merit)
  - Beneficience (help others)
  - Non-maleficience (don't hurt others)
  - Self-improvement
    - » http://people.wku.edu/jan.garrett/ethics/rossethc.htm

Professional frameworks

- Most professional associations have "frameworks" guiding professional conduct
- These typically include consideration of ethical conduct as it applies in professional activities
  - Linking possible outcomes to duties
  - Guidance in setting priorities
  - Penalties?

- ACS: Code of Ethics, and Code of Professional Conduct
- ACM / IEEE-CS: Code of Ethics and Professional Conduct

Professional frameworks

- ACS: Code of Professional Conduct
    - https://www.acs.org.au/content/dam/acs/rules-and-regulations/Code-of-Professional-Conduct_v2.1.pdf
    - 1.2.1. The Primacy of the Public Interest
    - 1.2.2. The Enhancement of Quality of Life
    - 1.2.3. Honesty
    - 1.2.4. Competence
    - 1.2.5. Professional Development
    - 1.2.6. Professionalism

- Detailed guidelines
- ACS has a procedure to handle complaints about members actions

Professional Frameworks

- ACM / IEEE-CS: Code of Ethics and Professional Conduct (International)

- ACM recently revised its code (2018)
  - Addressed "the significant advances in computing technology and the growing pervasiveness of computing in all aspects of society since it was last updated in 1992"
  - https://www.acm.org/code-of-ethics

  - A computing professional should...
  - 1.1 Contribute to society and to human well-being
  - 1.2 Avoid harm.
  - 1.3 Be honest and trustworthy.
  - 1.4 Be fair and take action not to discriminate.
- 1.5 Respect the work required to produce new ideas, inventions, creative works, and computing artifacts.
  - 1.6 Respect privacy.
  - 1.7 Honor confidentiality.

  - 2.6 Perform work only in areas of competence.
  - 2.9 Design and implement systems that are robustly and usably secure.
  - 3.1 Ensure that the public good is the central concern during all professional computing work.
- 3.7 Recognize and take special care of systems that become integrated into the infrastructure of society.

What if an ACS member breaches the code of ethics?

Where a breach is proven, the ACS may choose to apply any of the following sanctions:

- Admonition
- Reprimand
- Fine
- Suspension
- Expulsion
- Specified professional development
- Withdrawal of certification

Corporate Ethics

- How much does a company's ethical approach affect your choice.
  - Would you work for a tobacco company?
  - What if you were paid far more?
  - https://www.investopedia.com/terms/b/business-ethics.asp
- Corporate Social Responsibility
  - an organization's responsibility for the impacts of its decisions and activities on society and the environment.

- Fourth Bottom Line
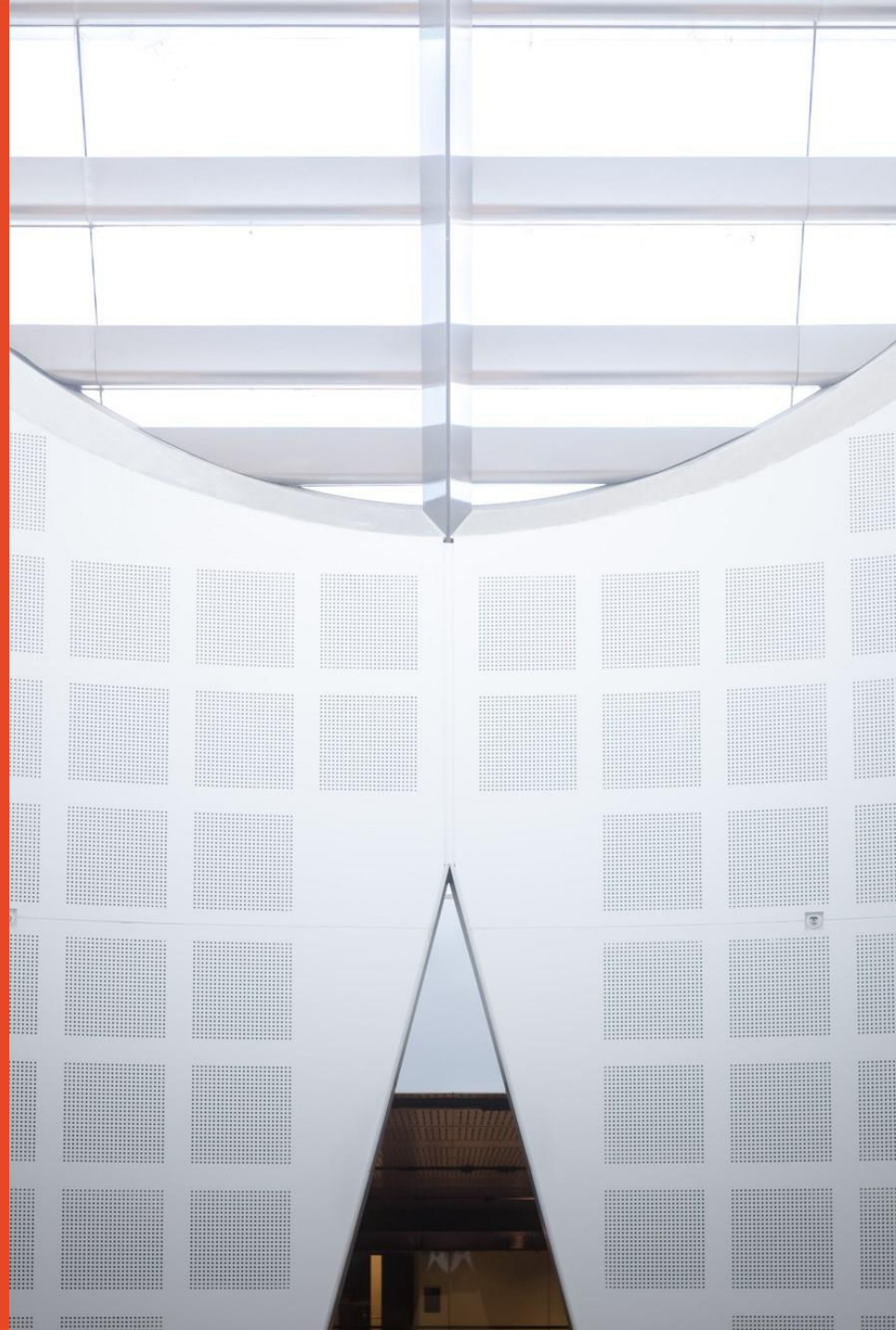 - Profit, people, planet and progress/ purpose/ principles

Volkswagen is being Investigated for Using Illegal Software Designed to Mask Emissions

By: Daniel Broderick

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Short Break

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Case study: Data Mining

- Facebook mood enhancement
    - Manipulated the feed of users to show posts with more 'positive' or 'negative' words
    - After a week, these users were more likely to post positive or negative words themselves.
    - Others have monitored Facebook data for this "emotional contagion"

    - Q: Is this a problem with Facebook's research? Why?

    - See:
        - https://www.theatlantic.com/technology/archive/2014/06/everything-we-know-about-facebooks-secret-mood-manipulation-experiment/373648/
        - http://www.computerworld.com/article/2596456/e-commerce/opinion--toysmart-case-can-set-bar-for-online-privacy.html

Case study: Data Mining

- Facebook – how powerful is its algorithm
  - Psychometric profile from Facebook profiles and posts
  - How well does Facebook know you?
  - Key words for marketing, decision making for businesses?
  - Cambridge Analytica → Political Advertising

  - Q: Is this a problem? What if it is used for benefits?

  - See:
    - https://player.fm/series/the-inquiry-1301456/how-powerful-is-facebooks-algorithm-a9lELMOpfbTcvSjy

Case study: Privacy

- Toysmart vs FTC (Fair Trade Commission)
    - Online Toy store in Waltham, Mass.
    - Privacy policy on website: would not share details ...
    - Filed for bankruptcy - and then sought permission to sell assets.
        - *Including customer information: names, addresses, billing info, browsing and purchasing history....*
    - Original FTC proposal was to allow this - but only selling to a buyer in a related market, who adhered to the original privacy policy
    - Disney bought the assets and destroyed the consumer information!

    - Q: Is this a problem? Why?

    - See:
        - http://itlaw.wikia.com/wiki/FTC_v._Toysmart.com
        - http://www.computerworld.com/article/2596456/e-commerce/opinion--toysmart-case-can-set-bar-for-online-privacy.html

Case Study: Privacy

- Google WarDriving
  - Google cars capture Street View information!
  - *But also captured WiFi data worldwide!*
    - *SSID, MAC address, signal strength, but also any unencrypted data packets.*
  - Google blamed a "rogue engineer"
  - *But later shown that Google managers had commissioned the wardriving program, to help them build Wi-Fi maps.*

  - Q: Aren't they just capturing data that is freely available anyway? And surely it helps them provide a better service?

  - See:
    - http://www.darkreading.com/risk-management/google-wardriving-how-engineering-trumped-privacy/d/d-id/1104126?

Scenario: Privacy

- You work as a system administrator, running the IT systems for a high school. The school principle comes to you concerned that some students had told him they had seen a teacher accessing pornography on his school-owned computer. The principle asks you to break into the teachers computer to see whether there is any problematic material?

- Would you do it? Under what circumstances?

- You run the IT systems for a contract cleaning company that cleans offices. Your boss tells you that he thinks one of the cleaners is leaving the site early and visiting a nearby friend, but still billing the extra hours. He wants you to add an app to the employee's company-provided mobile phone so he can track where it is.

- Would you do it? Under what circumstances?

Case study: Conflicts of Interest

- A conflict of interest occurs when:
    - "*influences, loyalties, temptations, or other interests*" exist that might affect a professional's judgment
    - A conflict of interest may be actual, potential or apparent
    - What action can you take that is considered 'ethical'?

- You work for a company that is considering implementing a new asset tracking system. Your spouse works for the leading supplier of these types of systems. Is this useful? Or a conflict of interest?

    - Read:
    - https://sydney.primo.exlibrisgroup.com/permalink/61USYD_INST/2rsddf/cdi_pascalfrancis_primary_14596002

Case study: Intellectual Property

- Kim DotCom
  - 2005: Founded MegaUpload
    - DotCom described it as "a provider of cloud storage services"
  - 2012: US indictments: racketeering, conspiring to commit copyright infringement, and conspiring to commit money laundering.
    - Arrested in Auckland. Assets seized/frozen
    - Currently fighting extradition

  - Q: What responsibility does a developer have to stop people using their system in illegal or unethical ways?

  - See:
    - https://en.wikipedia.org/wiki/Kim_Dotcom

Scenario: IP

- You accept a 6-month short term contract job, working for a small start-up that is creating a new App that locates the cheapest place near your current location to buy consumer items. Whilst working on the project you accidentally discover that they have obtained access to proprietary code from another company (that analyses web pages to find product price information). They aren't using the code directly, but they are analysing it so they can understand the algorithm and then duplicate it in their system.

- Is this OK? Why? What would you do about this?

Theory: IP Management

- Proprietary / Commercial
  - Protection: Copyright? Obfuscation?
- Shareware / Freeware / Open-Source
- Free Beer (no cost) vs Free Speech (no constraints)
- Licencing issues:
  - Still retains a copyright holder?
  - *Various* models for usage: Creative Commons; BSD; GNU; ...
    - Distribution; modification; sub-licensing; ...
    - See https://en.wikipedia.org/wiki/Comparison_of_free_and_open-source_software_licenses

- Is it good to release? When? Why?

- Read:
  - Gates Open Letter: https://en.wikipedia.org/wiki/Open_Letter_to_Hobbyists
  - Open Source Movement: https://en.wikipedia.org/wiki/Open-source_movement
  - About Creative Commons: https://creativecommons.org/about/

Case study: Unauthorised Access

- Hacking - Garry McKinnon
  - Scottish SysAdmin
  - 2002: One of the biggest Military Hacks of all time! → "Your Security is Crap"
  - Claims he was looking for information related to "Free Energy" and UFO cover-ups ???
  - UK has blocked his extradition to the US.

  - Q: Is hacking a good way to hone your skills?
  - Q: Is there a role for "White hat hackers" / ethical hacking?
  - Q: Would you have supported *Anonymous'* action against IS?

  - See:
    - https://www.wired.com/2015/10/cfaa-computer-fraud-abuse-act-most-controversial-computer-hacking-cases/
    - http://list25.com/25-most-notorious-hackers-to-ever-get-caught/

Scenario: Unauthorised access?

- Next semester you get a part-time job working for the University's ICT unit doing testing on development changes to Sydney Student. As part of this you have access (for testing purposes) to a copy of all course and student data.

- Is it OK for you to see unit of study results for your friends as part of your testing?
- Is it OK for you to see the results of other students who you don't know but who are in your course?
- Is it OK for you to see the results of students in other courses?
- Is it OK for you to see real results / personal information, if the names have been removed?

Case study: Fairness and Discrimination

- See https://www.youtube.com/watch?v=YJjv_OeiHmo

- Facebook / UTexas
  - 2012: Queer Quorus – added members to their Facebook group
    - Members' Facebook friends then knew they were members!
    - Loophole: anyone can be added to a group by a friend without their approval!
    - http://www.wsj.com/articles/SB10000872396390444165804578008740578200224

- Accessibility
  - 2014: Blind woman launches claim of unlawful discrimination against Coles regarding its website!

  - Read:
    - https://www.humanrights.gov.au/news/speeches/software-accessibility-its-everybodys-business
  - And see:
    - http://www.washington.edu/doit/designing-software-accessible-individuals-disabilities

Case study: Liability for Unreliability

- Therac-25
  - Medical radiation therapy machine for brain tumours.
  - Mid-1980's : At least 6 accidents of massive overdose of radiation, and at least 3 deaths.
  - Subsequent commission found:
    - Primary reason: bad software design and development practices
    - Code was not independently reviewed
    - No analysis of possible failure modes
    - Poor documentation of error codes, and ability to override

  - Q: Should the programmers have been held criminally liable? Why?
  - Q: How do you avoid hubris?

Scenario: Liability

- *Caveat Emptor?*

- In your spare time you write a game app. This includes a simple function called *left-pad*, which just pads out a string. You make your entire code open source.

- Someone uses your *left-pad* in their string manipulation library. Someone uses the string manipulation library in their data logging toolkit. Someone uses the logging toolkit in a traffic control system.

- Your code has a bug. It crashes the traffic control system and 3 people are killed in ensuing car accidents.

- Q: Are you liable? Why or why not? Q: Who then is responsible?

  - Read:
    - http://www.thejournal.ie/programmer-break-internet-code-2679793-Mar2016/
  - See:
    - http://www.badsoftware.com/theories.htm
    - http://www.law360.com/articles/544453/when-it-fails-software-vendor-liability-is-expanding
    - https://newrepublic.com/article/114973/bad-code-should-software-makers-pay-part-1

Theory: Practicing within your abilities?

- *Who here is a good programmer?*
    - *How do you know?*

- Professionalism – what does this mean?
- ACM Code of Ethics:
    - 2.2 Acquire and maintain professional competence.
    - 2.3 Know and respect existing laws pertaining to professional work.
    - 2.4 Accept and provide appropriate professional review.

    - Read:
        - http://science.raphael.poss.name/programming-levels.html
    - See:
        - http://programmers.stackexchange.com/questions/41473/how-can-i-know-whether-i-am-a-good-programmer
        - http://www.joelonsoftware.com/articles/HighNotes.html
        - http://www.halogensoftware.com/blog/self-appraisal-examples-to-use-as-guidance-or-inspiration

Case study: Intentional wrong doing

- Volkswagon Emissions Scandal
  - 2009-2015: VW programmed diesel engines to activate emissions controls only during lab testing.
  - 11 million cars worldwide!
  - CEO Horne said "it was a couple of software engineers"
  - Read:
    - http://www.newyorker.com/business/currency/an-engineering-theory-of-the-volkswagen-scandal

- StuxNet
  - 2010: Worm designed to attached industrial PLCs. Claims it was developed by the CIA to sabotage Iran's nuclear program.
- Morris Worm
  - 1988: One of the first computer worms that spread via the internet. Intended to be benign, but ended up causing significant damage.

Additional resources

- Case studies
  - http://computingcases.org/case_materials/case_materials.html

- Ethical Dilemmas
  - https://medium.com/@akash.chhabra/ethical-considerations-in-software-development-a-critical-discussion-for-and-beyond-2a1eb1dcaf06
- General concepts
  - http://c2.com/cgi/wiki?SoftwareEthics
  - https://www.scu.edu/media/ethics-center/technology-ethics/Students.pdf
  - https://www.researchgate.net/publication/277817334_Professional_Ethics_of_Software_Engineers_An_Ethical_Framework
  - http://www.slate.com/blogs/future_tense/2013/09/09/software_engineers_need_a_crash_course_in_ethics.html