

Chapter 4: Intellectual Property

- What is IP and why is it important?
 - IP refers to creations of the mind (i.e. Inventions, Literary/Artistic works, Symbols, names, images used in commerce)
- Locke's Definition of Property
 - People have right to property in their own person and to benefits of own labor
 - IP is different because making a copy doesn't take it away from anyone else
- How is IP protected? What are its limitations?
 - IP protected through things mentioned below
 - Benefits of IP: Allure of wealth can be incentive for innovation
 - Limitations of IP: Society benefits most when inventions in public domain
 - Computers make it easier to copy, store, and distribute
- Difference between Trade Secrets, Trade/Service Marks, Patents, and Copyrights
 - Trade Secret: Confidential Piece of IP that gives a company a competitive advantage. Never expires, reverse engineering allowed, may be compromised
 - Trade/Service Marks: Identifies goods and services for "brand name", doesn't expire but if brand name becomes common noun, trademark may be lost
 - Patent: Public document providing detailed description of invention, providing owner with exclusive right to invention for 20 years. U.S. works on first to file system with quick reviews (frequent overturn), EU is slow but careful review (rarely overturn)
 - Copyrights: Protects rights to make copies, produce derivative works, distribute copies, perform in public, display in public
 - Copyright Term Extension Act: Copyright Protection lasts for Life of Author + 70 years
- Fair Use: Sometimes legal to reproduce copyrighted work without permission
 - Purpose and Character of Use: Criticism, commentary, news reporting, teaching, scholarship and research
 - Nature of Work: Nonfiction more likely permissible than fiction
 - Amount of Work being copied: Brief excerpts more permissible than chapters
 - Effect on market for work: Out of print material more likely than readily available
 - Important case of Sony v. Universal City Studios with Time Shifting
- Digital Millennium Copyright Act
 - Made it illegal to circumvent encryption schemes placed on digital media
 - Service providers are expected to remove materials from users' websites that appears to constitute copyright infringement (provides mechanisms for claims)
 - Takedown Notices: No penalty for sending a false takedown, possible legal penalties for refusing a takedown (potentially bad for free speech)
- Software Copyrights (History, Expirations)

- 1964: First Copyright for Software applications. Violations entail copying program onto CD to give or sell, preloading program onto hard disk, distributing program over internet.
- Software Patents (History, Trolls)
 - 1981: SCOTUS decision led to first software patent
 - Patent Trolls: Companies that specialize in buying patents and enforcing patent rights, since companies would rather settle out of court than spend on trial
- Open Source (Five beneficial consequences)
 - Gives everyone opportunity to improve program
 - New versions of programs appear more frequently
 - Eliminates tension between obeying law and helping others
 - Programs belong to entire community
 - Shifts focus from manufacturing to service
- AI Copyright: Copyrighting AI model output depends on degree of human involvement

Chapter 8: Computer Reliability

- Notable Software Failures:
 - Patriot Missile: Clock error of 0.3433 seconds, added up to error of 687 meters
 - Ariane 5: Satellite Launch Vehicle that failed because float to integer conversion
 - AT&T Long-Distance Network: Single line of code in error-recovery procedure
 - Mars Climate Orbiter: Lockheed used English and JPL used metric
 - Tokyo Stock Exchange: Mizuho Securities employee fails to cancel disorder
 - Therac-25
 - Tesla Version 7.0 Autopilot: Truck driver failed to yield right of way, Joshua Brown didn't keep hands on steering wheel, Tesla neglected hand-off problem
 - Uber Test-Vehicle Accident: Woman in darker clothes, hard to see, was killed
- Computer Simulations
 - Simulations can be better than experiments (cost, ethicality, possibility)
 - Verification: Does program correctly implement model
 - Validation: Does the model accurately represent the real system
- Computer Warranties
 - Courts have resisted treating software as product, since software-controlled device may cause harm through no fault of programmer, puts too much liability on coder
- Software Engineering
 - Determining system requirements, understanding constraints, create end product
 - Standish Group reveals that success of IT projects in 2009 was twice that of 1994
- Bias in Training Data Sets
 - Gender Bias: Men and women have different approaches when it comes to coding
 - AI can be biased if given biased dataset (e.g. facial recognition systems)

Chapter 10 Work and Wealth

- Automation and Jobs
 - Pros: Increased innovation (Creation of new jobs), enhanced job experience
 - Cons: Job displacement, skill mismatch
- Advantages and Disadvantages of Telework
 - Pros: Flexibility, Increased Productivity, Cost Savings, Talent Access
 - Cons: Communication Challenges, Isolation, Monitoring, Tech Dependence
- Pros/Cons of Globalization
 - Pros: Increased Economic Growth, Access to New Markets, Cultural Exchange
 - Cons: Income Inequality, Loss of Jobs (labor costs), Cultural Homogenization
- Digital Divide: Divide between people with access to technology and people without
- The Great Rs: Phenomena exacerbated by the pandemic
 - Resignation: People quitting jobs
 - Retirement: Boomers retiring
 - Reshuffle: Reskilling and Switching industries
 - Refusal: People turning down bad jobs with low pay
 - Relocation: Picking where you want to live rather than where you want to work
- Implications of Globalization for all things digital
 - Increased connectivity, global information flow, economic opportunities, cultural exchange and diversity. However, there will be digital divide and cyber concerns
- Winner-Take-All-Effects
 - Situations in which small number of entities disproportionately capture significant share of overall rewards

AI, Algorithms, and Bias

- Types of Biases:
 - Reporting Bias: Frequency of events in dataset is inaccurate of real world
 - Automation Bias: Tendency to favor results generated by automated systems
 - Selection Bias: Data set examples are chosen in a way that is not reflective
 - Group Attribution Bias: Generalizing facts about individuals to entire group
 - Implicit Bias: Assumptions made based on one's own mental models
- Amazon failed to build algorithmic tool for removing biases for hiring purposes
- Face Recognition: Asian labeled as "blinking", AI thinking white people are more pretty
- Voice Recognition Systems in cars more difficult for women than men
- Solutions: Strategies that encourage participation from public, transparent data, formation of multidisciplinary teams, "litmus tests" to evaluate for discrimination
- Governance of Algorithms:
 - Auditability: Algorithm should be independently tested and validated with results made publicly available including explicit checks on bias

- Commitment to Due Process: Individuals should have right to appeal to AI decisions

Race and Tech

- Race: Physical attributes
- Ethnicity: Cultural aspects in a geographic region
- Tech with Racial Bias: Apple iWatch, Google, Automatic Faucets, Emojis
- Solutions: Hiring more people of color, user research, value sensitive design, reflexivity

Net Neutrality: All ISPs should provide equal access to content, at equal speed, without discrimination against particular sources

- Pros: Importance of equal access to consumers on internet for companies creating content
- Cons: Federal Communication Commission (FCC) regulations are overreaching

AI Content Generation

- Input Question: Where does original data come from (training based on copyright)
- U.S. v.s. U.K.: US says no copyright for works generated solely by machine. UK is other

Wikipedia:

- Epistemology: The study of knowledge, justifiable belief through evidence and reliability
- Virtue Epistemology: Obtaining knowledge as an achievement
- Social Construction of Knowledge: Objective truth only exists in a particular social context at a particular moment
- Peer Review: Authority/Credibility, Page history, citations
- Citogenesis: Loops between wikipedia editor finds previous work and adds citation, leading to unsourced content, leading to writer using wikipedia as a source without attribution.

NFT (non-fungible tokens):

- Pros: Reasonable investment like other forms of art
- Cons: Copyright issues, “ownership” meaningless
- Many ethical concerns according to ACM code:
 - Benefits rich through capital, at someone else’s loss
 - Transparency is regularly violated
 - Decentralization of the free market
 - Security, preying on less experienced
- Recommendations to solve the issue:
 - Avoid environmentally destructive methods for validations
 - Regulate NFT space
 - High quality creation

- Avoid exploitation or fraud
- Consider company risk and protect sensitive information