

7. Ethics and Ownership

7.1 Ethics and Ownership

Ethics

- What is **Ethics**?
 - A system of moral principles
 - That guides behavior/decision making
 - Based on philosophical/religious views
 - Ex: Respectful and considerate behavior
- Ethical Parties
 - *British Computer Society (BCD), Institute of Electrical and Electronics Engineers (IEEE)*
 - **Importance of joining an ethical party**
 - Does not have to decide what is ethical; it's written down
 - Clients/other staff know the standards being applied
 - Recognition of skills/knowledge
 - Clients/staff know that the person is reputable
- **IEEE Software Engineering Code of Ethics**
 - **Product:** Software engineers shall ensure that their products and related modifications meet the **highest professional standards possible**
 - **Judgement:** Software engineers shall maintain **integrity and independence** in their professional judgement
 - **Management:** Software engineering managers and leaders shall **subscribe to and promote an ethical approach** to the management of software development and maintenance
 - **Professional:** Software engineers shall advance **the integrity and reputation of the profession** consistent with the public interest
 - **Colleagues:** Software engineers shall be **fair to and supportive of** their colleagues
 - **Self:** Software engineers shall participate in **life-long learning** regarding the practice of their profession and **shall promote an ethical approach** to the practice of the profession
- Given a situation, how should one act ethically, and what is the impact of doing so → Discuss anything that's good for colleagues/team members/clients, like giving them training, redistributing their work, etc.

Ownership

- What is **Copyright**?
 - The **formal and legal** rights to ownership
 - Protects against **unauthorized reproduction of work**
 - Provides for the legal right of **redress**
- Software Licenses
 - **Free Software License**
 - Freedom to run, copy, distribute, study, change and improve software
 - New versions must be distributed with the original term of free use, modification and distribution
 - The source code is **released** with the program
 - Can be shared without permission
 - Not subject to copyright legalization
 - **Open Source License**

- The source code is **released** with the program
- Users can edit the source code or re-lease their version **under the same terms**
- Can be cost-free or costly
- **Freeware**
 - Free to download
 - Subject to copyright legalization
 - Need owner permission to share
 - Without source code
 - Can be restricted
- **Shareware**
 - Users get a free trial of the software
 - May be limited in features
 - **No access** to source code and cannot be edited
 - Have to **pay** after the expiry date
- **Commercial**
 - Requires payment before it can be used
 - **No access** to source code, a limited number of installations allowed for a user
 - **No** further copies are being made or distributed
 - **No** changes to the software
- Prevents illegal copies being installed
 - Encryption
 - Assign a unique code so that the app cannot be installed without it
 - Limit the number of times a version of the software can be installed
 - Set a time limit within which the software must be installed

Artificial Intelligence (AI)

- Machine/application which carries out a task that **requires some degree of intelligence when carried out by a human being**
 - Ex: language use, mathematical calculation, facial recognition, and etc.
- Given a situation, explain the use of AI:
 1. Use which kind of algorithm → e.g., facial recognition, speech recognition (artificial neural network if not specifically to the above two kinds)
 2. Steps of how the algorithm works → e.g., monitors every image taken to identify matching images/shapes/features to a "person"
- **Applications of AI**
 - **Police identifying wanted people:**
 - uses *image recognition*
 - identify features/characteristics/items in an image
 - **Natural Language Interfaces:**
 - uses *speech recognition*
 - identify words that are spoken and adapt to learn regional accents
 - **Self-driving Cars:**
 - detects its position on the road and within the traffic
 - follows a route // collision avoidance
 - **Spoken Interfaces**
 - use *natural language processing*
 - to take a sentence and work out its meaning
 - **Game Playing**
 - models characters in a computer game

- to allow computer characters to react according to the player's movements
- **Impact of AI**
 - **Economics:** less cost of production & higher productivity leading to higher profit margin
 - **Social:** unemployment (loss of low-skilled jobs), employment (more jobs in quality control, test driving) & people have more time to pursue hobbies when jobs are automated
 - **Environmental:** AI helps in finding patterns within thousands of datasets, helping scientists make informed predictions about environment