Software Engineering Ethics

JG UNIVERSITY EXCELLENCE BY CHOICE

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01. What is Ethics?

Software engineering is no longer just about writing efficient code—it must address ethical and legal concerns that arise from technology's growing role in our lives.

•**Ethics** = moral principles guiding software creation and use.

Ensures safety, fairness, privacy, and social responsibility.

02. Importance

Ignoring privacy, bias, or legal norms can lead to massive public distrust, lawsuits, and failed products. Ethical software development ensures trust, safety, and inclusivity.

03. Aims/Objectives:

- To highlight the ethical responsibilities of software engineers
- To explore real-world examples of misuse and best practices
- To promote responsible, fair, and lawful development

04. Key Areas of Ethics :

- **Data Privacy:**
  The right of individuals to control access to their personal information.
  Key Laws: GDPR, CCPA

- **AI Bias:**
  Systemic and hidden biases in data and algorithms leading to unfair treatment.
  Example: Biased facial recognition systems

- **Software Licensing:**
  Legal framework that governs how software is used and shared
  Types: Open-source (MIT, GPL), Proprietary

- **Responsible Development:**
  Developing software that is secure, ethical, inclusive, and sustainable

05. Methodology or Tools

- **Tools Used**
- GitHub (License Tracking)
- AI Fairness Toolkit by IBM
- GDPR Auditing Tools
- Code of Ethics (ACM/IEEE)

- **- Usage**
- AI bias detectors used to test datasets
- Privacy risk assessments during SDLC
- License scanners before integrating libraries

GDPR Data Mapping & DPIA Toolkit

06. REAL-WORLD APPLICATIONS / CASE STUDY

- **1) Facebook**–*Cambridge Analytica Scandal*
- *Highlighted massive user data misuse*

- **2) Amazon**'s AI hiring tool
- *Discarded after gender bias was found in hiring recommendations*

- **Benefits of Responsible Practices:**
- *User trust & product longevity*
- *Legal compliance*
- *Broader market acceptance*

- **Challenges:**
- *Complexity of ethical implementation*
- *Lack of clear global standards*
- *Cost and time constraints*

07. Challenges in software ethics:

- Lack of ethical awareness
- Algorithm bias
- Transparency Issues
- Cultural and legal differences
- Conflicts of Interest
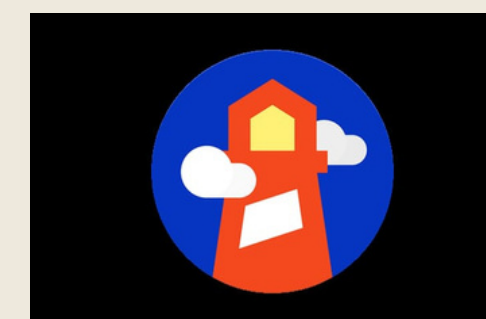
08. Future Of Ethics:

- **Future Scope**
- AI explainability tools
- Global standardization of digital ethics
- Integrated ethics modules in developer environments

- **Relevance**
As technology evolves, ethical software engineering will be the backbone of trustworthy innovation.

Conclusion :

- **Ethical and responsible software engineering is no longer optional—it's essential. Developers must integrate legal, social, and moral considerations into their process.**

References :

•*https://www.acm.org/code-of-ethics* (ethics Intro)
•*https://www.ieee.org/about/corporate/governance/p7-8.html* (ethics protocols)
•*https://towardsdatascience.com* (search for "AI Bias")
•*https://fairlearn.org/* (Fairlearn tool)
•*https://www.theguardian.com/news/series/cambridge-analytica-files* (Facebook case)
•*https://www.reuters.com/article/us-amazon-com-jobs-automation-insight-idUSKCN1MK08G(amazon)*

QR Code - to GitHub repo with code samples & research links

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Software Engineering Ethics: Avoid biases, Data privacy, Software Licensing, Responsible Development, Client and employers, Professional Responsibilities, Software Accountability, General Moral Imperatives