Ethical Software Engineering
By Design

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Introduction

Software engineering at universities: impact of research; education focused on technical problems

Diffusion of responsibility: from research to practice

Researchers → Applied Scientists → Product Teams → Marketing, Comms, etc. → Customers & Public


Software engineering in practice: every day business is impact of engineering

EU regulation: (high risk) AI applications

Teaching, development, certification
Ethics

Values and Impact: Deontological and consequentialist ethics

Reproach to ethicists: „Useless!“ (and to software engineers: „Not informatics anymore!“)

Indeed: >120 Codes of Conduct for AI/Software/Systems Engineering rather fruitless

Reason: Software context-specific; hence values and trade-offs context-specific
  Contexts: application domain, technology, users’ culture, developers’ culture, optimization goals, …

Examples: Corona app, face recognition, data integration, care robots, resume analyzers, etc. – but also software without AI/data: camera surveillance w/o FR, BitTorrent, Telegram, Bitcoin, website preferences, …

Genericity of CoCs hence necessary. Only way out: schema that caters to context specificity.
“Rather of Deontological Usefulness”: what about trade-offs?

https://standards.ieee.org/industry-connections/ec/ead-v1.html
https://www.acm.org/code-of-ethics
https://ge.de/uber-uns/organisation/unsere-ethischen-leitlinien/

Gogoll, Zuber, Kacianka, Greger, Pretschner, Nida-Rümelin:

CoC necessarily generic - McNamara et al. (2018) find no evidence that CoCs influence behaviour
Development: Ethical Deliberation in Agile Processes

No simple way out. Need to address concerns in a context-specific manner: think!
Can be done in a systematic way

Development driven by EDAP: “Ethical Deliberation in Agile Processes”

Key idea: start with values; continuously reflect on mechanisms, not yes/no

Characteristics of agility blend particularly well: planning; incrementality; empowerment; learning

Later today: How to teach?

https://www.nature.com/articles/s41599-022-01206-4

Software Engineering and AI

Ethical issues are not confined to AI – but this is suggested by the current debate!
A centralized Corona app? Palantir Foundry? Integration of registers?

Who is responsible?
Teaching: Later Today


General ethics classes; or ethics in CS: Harvard EthiCS project
[Gross et al., Embedded EthiCS: Integrating Ethics Across CS Education, CACM 62(8), 2019]

General overviews available, e.g.
[Fiesler et al., What Do We Teach When We Teach Tech Ethics? A Syllabi Analysis, Proc. SIGCSE, 2020]

Impact?
- „Less meat after an ethics class“
  [Schwitzgebel et al., Do ethics classes influence student behavior? Case study: Teaching the ethics of eating meat, Cognition 203 (2020)]
- Students „liked it“ [Gross et al., Embedded EthiCS: Integrating Ethics Across CS Education, CACM 62(8), 2019]

Implemented in forefront industry: E.g., Palantir
Certification

Product  Individual  Process  Organization
Final Comments

Ethics not reproducible to compliance: default is people seen as risk! Empowerment?

Power asymmetry: programmers can quit

Considerations apply to both UI and program logic

DevOps, specifically MLOps: ethical consideration doesn't stop at a specific moment in time. For AI, context continuously changes (!)

Others tell us that the ideas generalize beyond Agile
Wrap-Up

Along with others, software engineers individually responsible for the technology they build

Ethics not only an AI concern. Software is the concern.

Education: hypotheticals; practical courses; practical courses with EDAP

Certification: individuals, organizations, and systems (or development processes for a system)

Engineering: Structured deliberation with EDAP – agility and ethics seem a perfect match. Pick your values. Ethics not reduced to yes or no: choose a mechanism.

Let’s not overdo it though: what is the first-order problem here?