

# ETHICS IN SOFTWARE ENGINEERING – SHOULD WE CARE?

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# Let me tell you a story...

# Feedback – thanks in advance!!



[bit.ly/Ethics25](https://bit.ly/Ethics25)

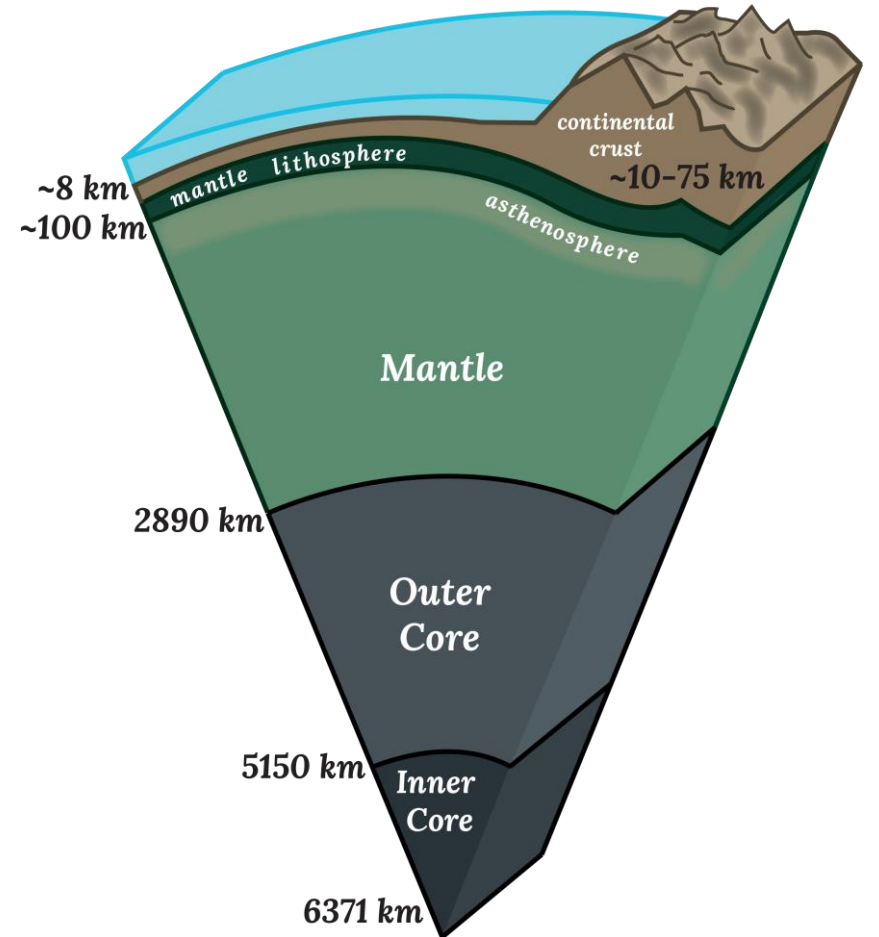
# Agenda

1. Why care
2. What it is – decomposing Ethics
3. What we can do about it

# My context & motivation

# A Geo-Story

- **Geology**
- **Geotechnology & Mining**
- **Geological Engineering**
- **Geochemistry**
- **Geophysics**
- ... ..
- **Geo...this, Geo...that, etc.**





**Software is eating the  
world, in all sectors**

**Mark Andreessen**

founder of Netscape,  
renowned Venture Capitalist  
Andreessen-Horowitz

ence ▾

Security ▾

Data Infrastructure ▾

Automation ▾

Enterprise Analytics ▾

# OpenAI expands Deep Research access to Plus users, heating up AI agent wars with DeepSeek and Claude

Michael

@Michael

February





how do I use the new Deep Research function here?

The **Deep Research** function allows me to conduct in-depth investigations on complex topics by gathering, analyzing, and synthesizing information from multiple sources. If you want to use it, just let me know what you need detailed research on, and I'll initiate it for you.

Here's how you can use it:

1. **Ask a research question** – Be as specific as possible.
2. **Define scope** – Let me know if you want a focus on certain aspects (e.g., technical details, market trends, competitive analysis).
3. **Get results** – I will analyze and summarize the most relevant findings for you.

Ask anything



Search



Deep research



### Research Question:

What are examples of alleged unethical behavior or actions of software engineering teams that have lead to significant negative consequences or impact for users, clients or society?

### Scope Definition:

- Focus on cases that gained publicity and were described in trustworthy media.
- Include insights on what good practices - on organizational or personal level - could have prevented the negative outcomes.

# Unethical Software Engineering Cases and Lessons

## Introduction

Modern software powers critical aspects of society, and unethical decisions in software engineering can have far-reaching negative consequences. Below we examine several high-profile cases where software teams engaged in unethical behavior, leading to significant harm to users, clients, or the public. Each case details the unethical action, its impact (financial, security, reputational, societal), how the issue came to light, legal/regulatory fallout, and steps taken afterward. We then highlight best practices—organizational and individual—that could have prevented these failures. Key takeaways emphasize

# Unethical Software Engineering Cases and Lessons

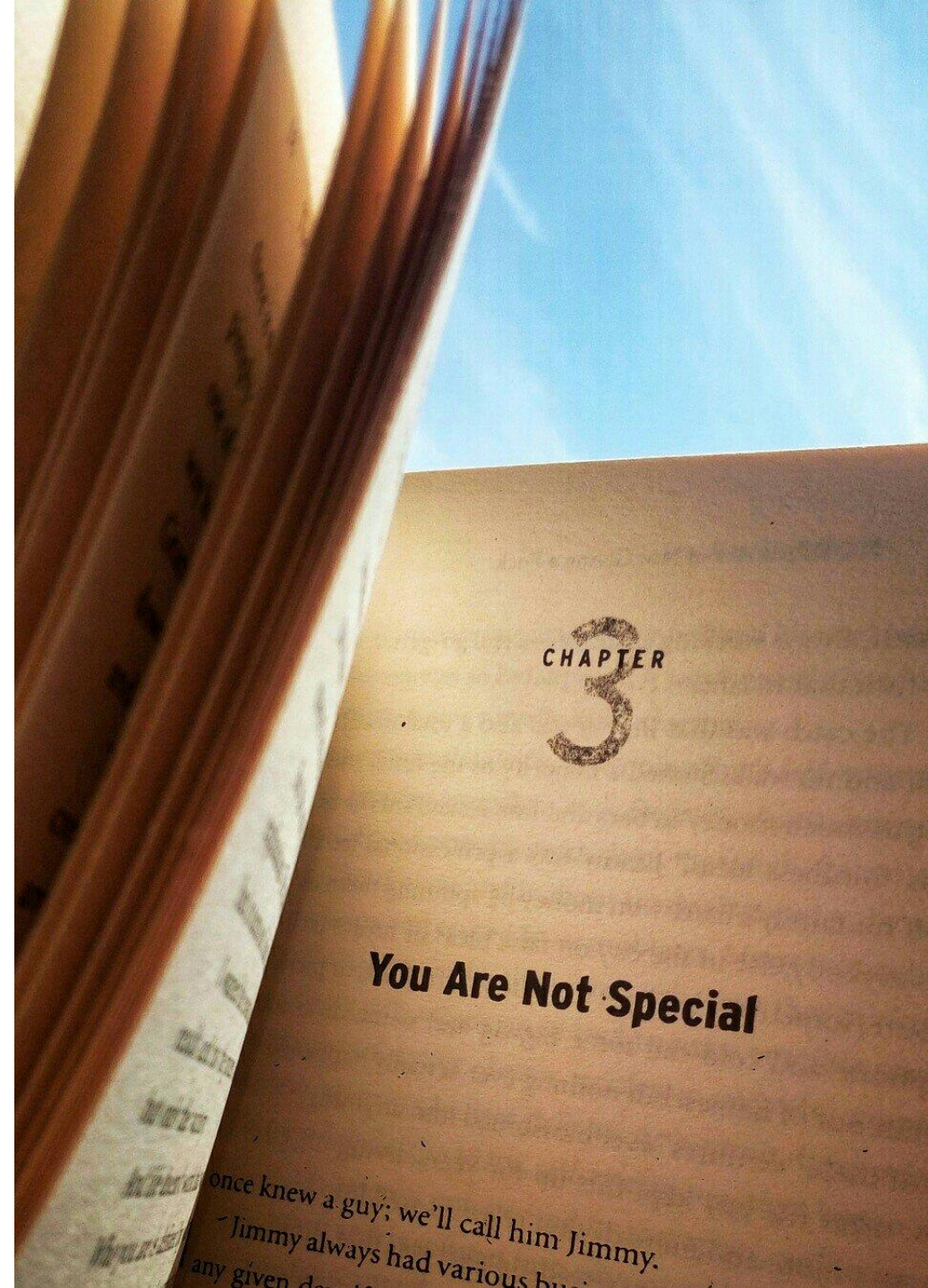
## Introduction

*virtually all*  
Modern software powers ~~critical~~ aspects of society, and unethical decisions in software engineering can have far-reaching negative consequences. Below we examine several high-profile cases where software teams engaged in unethical behavior, leading to significant harm to users, clients, or the public. Each case details the unethical action, its impact (financial, security, reputational, societal), how the issue came to light, legal/regulatory fallout, and steps taken afterward. We then highlight best practices—organizational and individual—that could have prevented these failures. Key takeaways emphasize



# We are not special!

(we're mostly just lucky)





We are  
*very*  
~~not~~ special!



# Ethical Misconduct Examples

# Volkswagen's Emissions Test Cheating (2015)

- **“Defeat device” software to cheat emissions testing**
  - during lab tests – 40 times less nitrogen oxides emissions
  - deliberate scheme misleading regulators and consumers
- **Impact** – 11 million vehicles globally (500 000 in USA) – 10 000s tons of excess pollutants
- **Exposure** – West Virginia University researchers in 2014, admission by VW in Sep. 2015
- **Outcome**
  - VW pleaded guilty to fraud and deception
  - \$4.3 billion in penalties, \$14.7 billion committed to buy back or fix



# Facebook & Cambridge Analytica Data Scandal (2018)

- **Personal data collected without consent and used for targeted election advertising**
  - third-party app collected personal data about its users and their FB friends (~\*~)
  - FB failed to restrict how this data was used or ensure its deletion
  - Cambridge Analytica exploited the data for targeted election advertising
- **Impact** – over 50 million Facebook users
- **Exposure** – Christopher Wylie (ex-FB), The Guardian and The New York Times reporters
- **Outcome**
  - millions of people felt stolen data could be weaponized for political manipulation
  - \$5 billion in fines for Facebook; Cambridge Analytica shut down, pending settlement

# Boeing 737 MAX Software and Safety Misconduct (2018–2019)

- **MCAS - unethical design and certification decisions regarding the aircraft's software**
  - **cost and speed over safety** – knowingly relied on a single sensor with no redundancy
  - **withheld information** about MCAS from regulators and airlines
  - **omitted MCAS from pilot manuals** to avoid expensive simulator training
  - engineers faced **pressure not to flag safety concerns**
  - organizational **culture that silenced criticism**
  - **downplayed systemic issues**, attributing 1<sup>st</sup> crash to pilot error
- **Impact** – **346 people lost their lives** in two 737 MAX plane crashes (Oct. 2018, Mar. 2019)
- **Exposure** – only through the post-accident investigations

## ...And Many Others

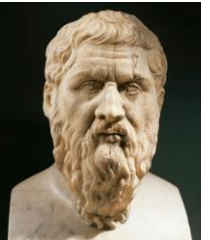
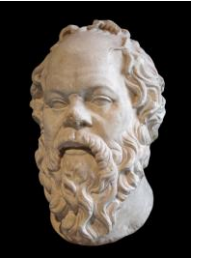
- Apple “Batterygate” iPhone throttling (2017)
- Ashley Madison data breach and deception (2015)
- Uber “Greyball” law evasion program (2014–2017)
- Zenefits licensing cheating scandal (2015–2016)
- Facebook the military crackdown in Myanmar (2017)

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# Ethics

- Word etymology – from Ancient Greek:
  - ἠθικός - ēthikós, “**moral**, expressing character”
  - ἦθος - êthos, “**character**, moral nature”
- In ancient Greek philosophy – 5<sup>th</sup>-4<sup>th</sup> centuries BC – a concept for:
  - Socrates – **ethical inquiry & critical thinking**
  - Plato – **moral values**, the nature of justice, the “ideal” God
  - Aristotle – **virtuous character** traits leads to a **fulfilling life**
- Nowadays – extended with:
  - **ethical dilemmas**, decision-making and **moral reasoning**



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

- Potter Stewart, former Associate Justice of the US Supreme Court

**Ethics** is about having an **intelligent discussion**, not about answers, as such—it's about having the tools to think carefully about real-world actions and their effects, **not about prescribing what to do** in any situation.

- Mike Loukides, Author and VP of Content Strategy for O'Reilly Media

**Every line of code** represents an **ethical and moral decision**.  
And, that encompasses **where and for whom one chooses  
to work to write that code**.

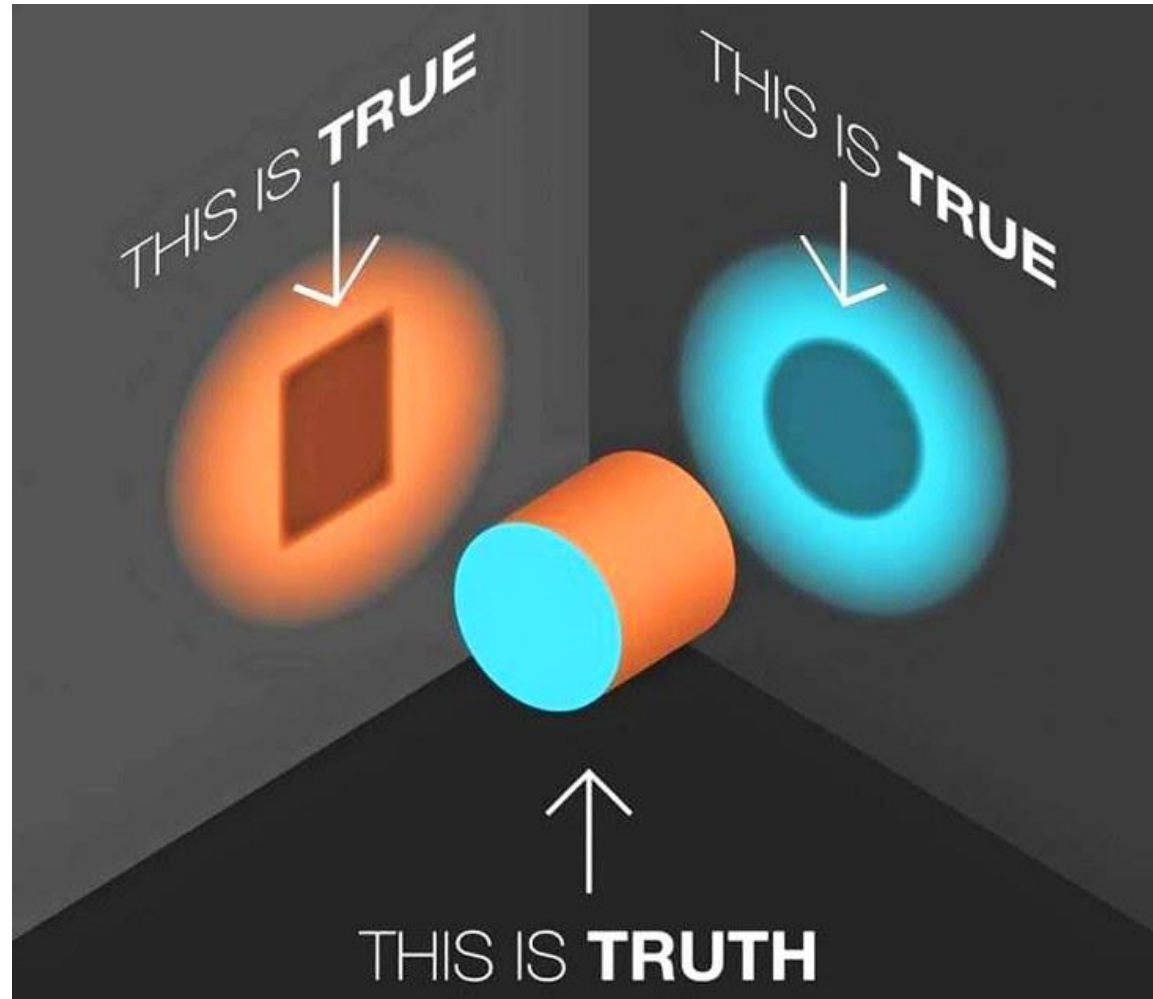
- Grady Booch, American software engineer, co-creator of UML



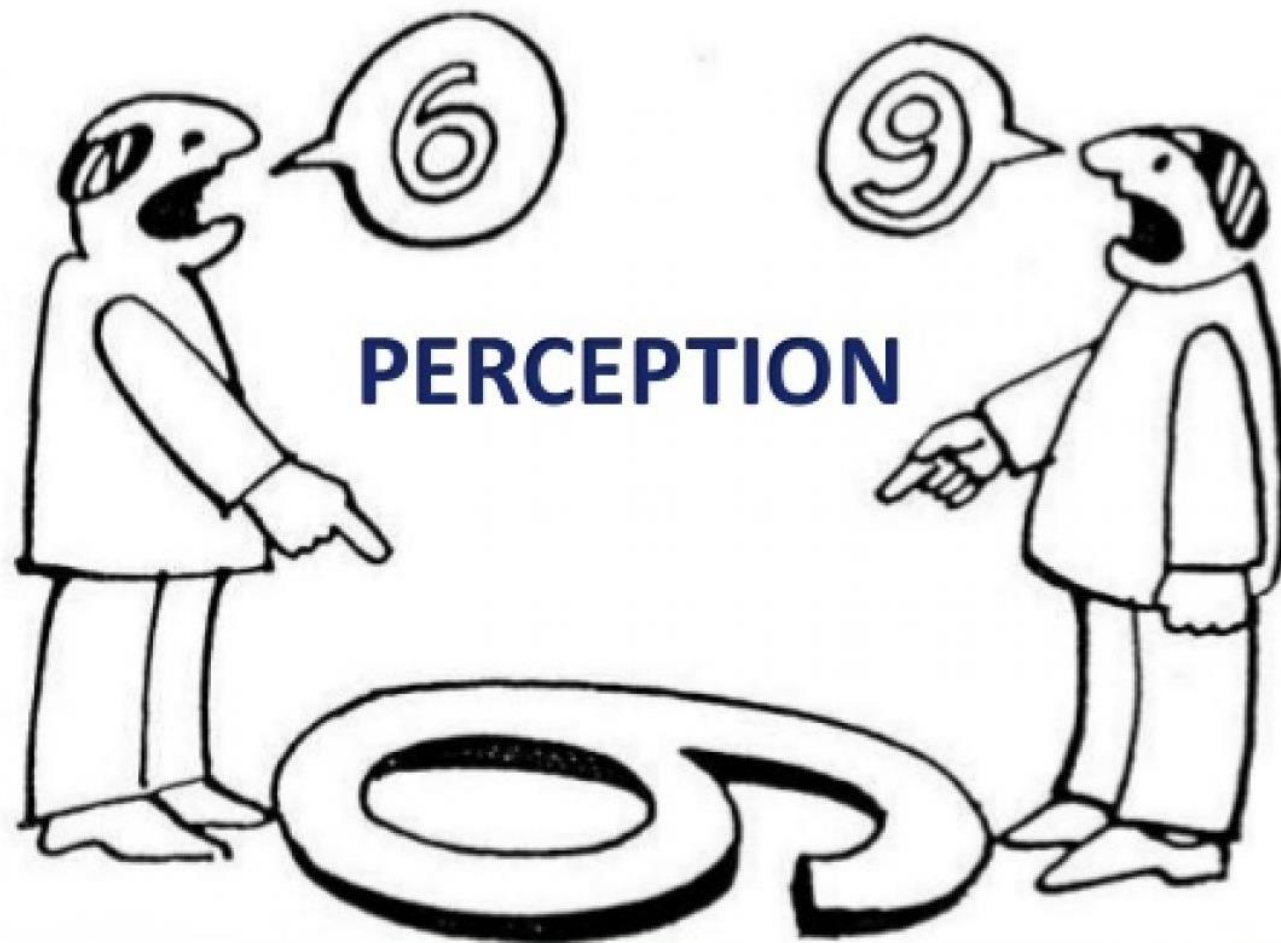
- Why is it hard?
- Well... because "it depends" :)











# Ethical Dilemmas, Pitfalls and Hard Choices

# Dilemmas and Hard Choices

## 1. Data Privacy

- protect **sensitive user data** while still delivering the necessary functionality

## 2. Algorithmic (and AI) Bias

- promote fairness and equality – by **eliminating bias and discrimination** against certain groups

## 3. Addictive Design

- **protect users from addiction to a software product** that can lead to health issues, social isolation, impaired well-being, financial consequences, etc.



# Dilemmas and Hard Choices

## 4. Conflicting Stakeholder Interests

- balance **client needs, business goals, and societal impact** – while not mistreating anyone

## 5. Security

- **How much protection** is enough?
- **When to disclose** a vulnerability after finding it?

## 6. Product Safety

- balance **budgets, target deadlines and safety** – esp. in Healthcare and Autonomous Vehicles





# Dilemmas and Hard Choices

## 7. Ethical Use of AI

- potential for **misuse** of AI, such as deep fakes
- **explainability** and transparency

## 8. Surveillance and Privacy

- privacy rights and potential **abuse of power** with software that enables **surveillance practices**

## 9. Manipulative Design

- UI that **intentionally tricks users** (e.g., hard-to-cancel subscriptions, misleading consent options)



Guns don't kill people,  
people kill people.

Michael Moore

# Structuring Ethics

# IEEE-CS/ACM Code of Ethics

- ✓ Task Force on Software Engineering Ethics and Professional Practices
  - IEEE Computer Society (Institute of Electrical and Electronics Engineers)
  - ACM (Association for Computing Machinery)
- ✓ Code of Ethics
  - 8 principles
  - commitment to the health, safety and welfare of the public
  - <https://www.computer.org/education/code-of-ethics>



# Code of Ethics – 8 Principles (IEEE-CS/ACM)

## 1. PUBLIC

- Software engineers shall act consistently with the **public interest**.

## 2. CLIENT AND EMPLOYER

- Software engineers shall act in a manner that is in the **best interests of their client and employer** consistent with the public interest.

## 3. PRODUCT

- Software engineers shall ensure that their products and related modifications **meet the highest professional standards** possible.

## 4. JUDGEMENT

- Software engineers shall maintain **integrity and independence** in their professional judgment.

# Code of Ethics – 8 Principles (IEEE-CS/ACM)

## 5. MANAGEMENT

- Software engineering managers and leaders shall subscribe to and **promote an ethical approach to the management** of software development and maintenance.

## 6. PROFESSION

- Software engineers shall **advance the integrity and reputation of the profession** consistent with the public interest.

## 7. COLLEAGUES

- Software engineers shall **be fair to and supportive of their colleagues.**

## 8. SELF

- Software engineers shall participate in **lifelong learning** regarding the practice of their profession and shall **promote an ethical approach** to the practice of the profession.

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# Every One of Us, Personally

1. Have **courage and integrity**, make the ethically right decisions when it hurts.
2. Always strive to know and understand the **Big Picture**.
3. **Speak up**, and if needed – **say No!** Especially when no one else does. (~\*~)
4. Stand up for and **lend a hand!** To a mistreated colleague, client or partner.
5. **Dig deeper** into the topic of Ethics.
6. Consider the Ethics angle when choosing **your next employer**.



# At Our Companies

1. Ultimately – **Ethics should come before profits and growth.**
2. **Raise awareness**, promote the topic – start a discussion, do a presentation
3. Get **Management attention** – suggest establishing a **Code of Ethics** and policies
4. Get **Management commitment** – regular top management mentions work best
5. Incorporate Ethics questions in the regular **company assessment survey**

# At Our Companies

6. Consider establishing regular **ethical risk assessments** for projects
7. Encourage engineers to **raise concerns without fear**, establish confidential reporting channels
8. Accountability - if something unethical slips through, **admit and fix – don't cover up**
9. User-Centric Design, Privacy and Safety By Design  
“Who benefits and **who could be harmed by this feature?**” – for each feature

# Beyond Ourselves & Our Companies

1. **Spread the word** and raise awareness – share, discuss with peers
2. Do a **meetup or conference session** on the topic, share experiences
3. Engage with **Ethics-related initiatives** in the IT community

# Corporate Code of Ethics – Links for Inspiration

✓ **Oracle**      [Code of Ethics and Business Conduct](#)



✓ **Adobe**      [Ethics and Integrity](#)



✓ **Salesforce**      [Office of Ethical and Humane Use](#)



✓ **GitLab**      [Code of Business Conduct & Ethics](#)



✓ **Lucid**      [Code of Ethics and Conduct](#)



✓ **Shopify**      [Code of Conduct](#)



# Wrapping Up + Pigs and Bungee Jumps

involvement



commitment!



“The difference between involvement and commitment is like ham and eggs. The chicken is involved; the pig is committed.”  
martina navratilova

**When in doubt or tempted to back off –  
take the first step mechanically, without thinking!!**



# Coda.

## A Poetic Digression



... ..

Did they get you to trade your heroes for ghosts?

Hot ashes for trees?

Hot air for a cool breeze?

Cold comfort for change?

Did you exchange

A walk-on part in the war for a lead role in a cage?

... ..

# Where is This Quote From?

... ..

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# Wish You Were Here (Pink Floyd)

... ..

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A walk-on part in the war for a lead role in a cage?

... ..





<sup>very</sup>  
We are ~~not~~ special,  
remember?

...so be strong  
and make that bungee step  
when you need to!





**MERCI BEAUCOUP  
FOR YOUR ATTENTION 😊!**

**Iancho Dimitrov**



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# Feedback – thanks in advance!!



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