ENGR 401 Assignment 1 - 2024 T1

Current and Potential Ethical Crises In Technology

- Value: 15% of final grade.
- Length: max 2000 words or 4 pages, whichever is less.
- Due: 22/03/2024 by 23:59
- Submission: PDF (only) via ECS Submission System.

In July 2023 the Forbes Technology council published *16 Current and Potential Ethical Crises In Technology*. This is an excellent summation of the dilemmas that you may encounter in the early years of your professional careers. This article is reproduced in the following pages and you will need to choose one of the sixteen crises as the topic for your assignment.

You will need to research the issue, and discuss the ethical issues involved. You will need to apply one or more of the ethical lenses from class and you are expected to show a critical understanding of the issues at stake, and apply the IPENZ code of Ethical Conduct.

You are expected to appropriately support claims, by referencing both formal and informal sources of information. You are required to use the numeric IEEE citation style for your references.

Essential things to note:

- You may include diagrams if this assists your explanations. In this case, you should apply the 4 page limit.
- We will use the standard marking rubric - attached at the end of this handout.

16 Current and Potential Ethical Crises In Technology

The power of technology is reshaping industries and revolutionizing the ways we live and work. However, along with the added productivity, convenience and power that technology brings comes a significant responsibility for industries, governments and citizens to ensure its ethical use.

While there's justifiable excitement about the many new technologies entering the market—especially, although not limited to, artificial intelligence —it's important to ensure they're used wisely and well and for the benefit of all members of society. Below, 16 members of Forbes Technology Council share some of the current and potential ethical challenges concerning technology as well as how all of us as a society can address them.

1. Protecting Private Information

With an exponential increase in the collection and storage of personal data, challenges have arisen regarding privacy. As we traverse the technological frontier, an increasingly pressing issue that troubles me greatly is the difficulty of preserving the confidentiality of private information, owing to our growing dependence on digital infrastructures across almost all daily activities. Privacy is a privilege nowadays. - Mark Ruber, MTSolutions Group

2. The Rush To Deploy AI

With the advances in generative AI, companies cannot avoid the rush to capitalize on the acceleration of knowledge worker tasks. However, rushing to deploy AI creates minefields of new risks, including unintended biases and regulatory violations. The mass layoffs of in-house ethics teams at several large tech companies should serve as motivation for others to double down on their pursuit of responsible AI. - Usama Fayyad, Institute for Experiential AI, Northeastern University

3. The Proliferation Of Misinformation

One ethical crisis in technology is its ability to easily create "deep fakes" and misinformation. Technology makes it possible for the video you are watching to look accurate, even though it's not. Or, the article you are reading may seem to be correct but is really riddled with misinformation. Now more than ever, relying on trusted sources that provide vigorously validated content is critical. - Michael Dennis, CAS, a division of the American Chemical Society

4. The Need For AI Guardrails

AI tools can be a great benefit to companies in terms of productivity and efficiency, but it's critical that they're supervised. Tech leaders must get ahead of ethical concerns related to data protection, security and intellectual property by introducing industrywide regulations, as well as company-level guardrails that will ensure that artificial intelligence is both safe and effective. - Marco Santos, GFT

5. The Lack Of Transparency Around Data Usage

We know that our data is being used by businesses, and we are happy when our data is used to improve service quality. However, a potential issue that is burgeoning today is the lack of transparency around companies' usage of personal data. Consumers need answers to the following questions. How are businesses using my data? Are they sharing it with other providers to deliver a better service? What data is being used and where? The transparency crisis is looming. - Kiran Menon, Tydy

6. Ensuring AI Is Used Only For Good

Generative AI and large language models in particular are advancing rapidly and are becoming more and more powerful by the day. How do we ensure AI is used for good? How do we provide the necessary guardrails, privacy and security? And how do we minimize deception and, more importantly, provide transparency about generative AI? The first one concerns me the most—let's hope regulations can come fast enough. - Lana Feng, Huma.AI, Inc.

7. Spyware

Government spyware and zero-day exploit markets present an ethical crisis. Software that's designed to hide on your computer and steal information without your knowledge is malware, even if a "legitimate" company has sold it to a government organization. And not disclosing a zero-day vulnerability in

a widely available consumer product, so the government can use it for espionage, puts us all at risk. Companies must do better. - Corey Nachreiner, WatchGuard Technologies Inc.

8. The Ease Of Access To AI

The impact artificial intelligence will have on society is similar to or greater than that of the discovery of nuclear energy, so robust ethical guidelines need to be put in place. And it's much easier to access AI than nuclear energy, which makes AI more difficult to control. A lot of thought must go into developing ways to detect AI's harms and correct them. We don't currently have many effective measures for this. - Kazuhiro Gomi, NTT Research

9. Fabricated Studies Being Quoted By Generative AI

Generative AI is generating articles that quote studies by real organizations, but those studies are fabricated. So now we are being served statistics that are completely fabricated, yet attributed to analyst groups or the Big 5 consultants. The amount of disinformation being spread is alarming. We all need to be fact-checking when we use generative AI to help us create content. - Laureen Knudsen, Broadcom

10. The Lack Of Awareness About LLMs

Some entities are hiding or obscuring the fact that generative technology relies on large language models and are passing off the output as fact or truth. It is already hard to tell fact from fiction in 2023, but I suspect it is about to get a lot worse. - Elise Carmichael, Lakeside Software

11. Blockchain's Vulnerability To Scams

I've seen no industry that's more scam-prone than blockchain. Quick coin launches fuel both innovation and abuse, and major scams have occurred even in regulated exchanges such as FTX. Regulation isn't the answer; cryptographic solutions like zero-knowledge proof are. They can prove a smart contract's function, validate an exchange's claimed reserves and assure the accuracy of on-chain data. - Marlene Ronstedt, Play by Ear

12. The Risk Of Biased Outcomes From AI

AI—especially the accelerated adoption of generative AI—comes with the ongoing risk of producing biased outcomes. AI models are trained on input

data that reflects our societal biases, which can be amplified through machine learning. To develop responsible AI technologies, we have to understand what those biases are and make sure we can account for them accordingly. - Merav Yuravlivker, Data Society

13. The Lack Of Consensus Over Appropriate Uses For Generative AI

Questions about ChatGPT's ethical use are all over the news, as we're not ready for it from an ethics standpoint. Is it okay to use ChatGPT to provide views for this discussion or to diagnose patients? We have no strategy for approaching AI. I hope big tech and government will come up with a code of ethics on how we can best use AI in our lives. It'll take time, and now, it's a question of personal ethics. - Nadya Knysh, a1qa

14. The Alienation Of Older Consumers

As technology advances, companies need to ensure they aren't leaving less tech-savvy users behind. Shuttering brick-and-mortar locations for ones located in the metaverse may make good financial sense and appeal to younger demographics, but it could alienate older customers. - Patti Mikula, Hackworks Inc.

15. Falsified 'Green Reports'

Technology enthusiasts enjoy the cybersecurity conversation, but when environmental concerns are the question, cybersecurity fails. Sometimes, individuals will produce "green reports" in which the metrics and information are falsified to satisfy management. This can be as simple as removing printers to meet benchmarks—which still means the environment is at risk. This is unethical. Encouraging responsible ownership is key. - Dewayne Hart, SEMAIS

16. The Risk Of Autonomous, Unchecked AI Systems

If AI systems become too autonomous and operate without proper safeguards, they could make decisions that are harmful or contrary to human values, leading to unintended and uncontrollable consequences. Governments should work alongside businesses, researchers and experts to develop comprehensive governance frameworks for AI. - Fidelis Chibueze, Fixtops Technology

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Original article: https://www.forbes.com/sites/forbestechcouncil/2023/07/25/16-current-and-potential-ethical-crises-in-technology/

ENGR 401 Assignment 1
Case Study: Ethical Dilemmas in Engineering

Case Study Marking Scheme

Trait	Excellent	Good	Satisfactory	Unsatisfactory
Identifies and describes the main issues. [20 marks]	Identifies and demonstrates a sophisticated understanding of the main issues in the case study, making a makes thorough and accurate selection of relevant evidence	Clearly identifies, and demonstrates an accomplished understanding of all the issues, with a fully accurate description of the situation and selection of evidence for task at hand.	Identifies and demonstrates acceptable understanding of some of the issues, with an adequate and largely accurate description of the situation and selection of evidence for task at hand.	Does not identify or describe the main issues or does so with significant omissions and/or inaccuracies in description of situation and/or evidence.
Analysis and evaluation of issues [20 marks]	Presents an insightful and thorough analysis of all issues, interpreting the evidence systematically and with justification.	Presents a thorough analysis of all the issues identified, with an accurate and convincing interpretation of evidence.	Presents a reasonable but limited analysis of most of the issues identified, with a plausible interpretation of the evidence.	Analysis is superficial or incomplete and/or the interpretation of the evidence is, inaccurate, distorted or misused.
Draws valid conclusions and/or makes effective recommendations for solutions/strategies [20 marks]	Draws thorough conclusions, presenting a balanced and critical view, with a reasonable and objective interpretation supported with evidence.	Conclusions are clear, logical, appropriate, and aligned with the analysis in the case study.	Draws sensible but pedestrian conclusions, generally in line with the analysis but somewhat one-sided; limited engagement with issues.	Conclusions are poorly defined, illogical, inappropriate or misaligned with the evidence and analysis in the case study.
Links to core course concepts, readings and/or additional research [20 marks]	Connections between the issues identified and the course concepts are appropriate and powerful, the research is relevant and thoughtful.	The issues identified are appropriately and convincingly linked to lectures, readings and/or additional research.	Makes appropriate but vague connections between identified issues and concepts studied in the course, limited research.	Makes superficial, inappropriate or no connections between issues identified and course concepts, no supplemental research
Written Communication [20 marks]	See the supplementary guide on the next page.	See the supplementary guide on the next page.	See the supplementary guide on the next page.	See the supplementary guide on the next page.

ENGR 401 Assignment 1
Case Study: Ethical Dilemmas in Engineering

Written Communication Marking Scheme

Trait	Excellent	Good	Satisfactory	Unsatisfactory
Technical writing skills: Spelling, capitalisation, punctuation, grammar, general proofreading.	No spelling errors, no discernible flaws in punctuation, grammar and sentence construction.	Very few spelling errors, correct punctuation, grammatically correct, complete sentences.	Lapses in spelling, punctuation and grammar, but not enough to seriously distract the reader.	Numerous spelling errors, absent or incorrect punctuation, and/or severe grammatical errors.
Vocabulary: Originality, breadth, variety and appropriateness.	Sophisticated use of vocabulary, choice of words and discipline-specific terminology.	Consistently appropriate vocabulary, consistently correct word choice and discipline-specific terminology.	Generally appropriate vocabulary; not overly repetitive. Generally, chooses correct words and terminology.	Excessively limited, inappropriate or repetitive vocabulary. Misuses words and discipline-specific terminology.
Structure and style: Document, paragraph and sentence structure, flow and layout, appropriate to audience.	Elegant and thoughtful sentence and paragraph construction, which enhances the reader's understanding.	Variety of sentence construction; logical flow; style and structure appropriate for task, audience and genre.	Not overly repetitive; some variety in sentence construction; generally, flows well; some awareness of audience and genre.	Repetitive and/or simplistic sentence structure; consistently disjointed, lack of flow; style/structure inappropriate for audience.
Clarity and conciseness: Answers the question, succinct, appropriate complexity.	Displays clarity of thought through a cogent argument focussed on the question, enlightening the reader.	Argument is effectively conveyed, addressing the question in an easily understood manner.	Argument reasonably clear; occasionally misses the point but answers the question; not excessively elaborate or complicated.	Main point and/or argument confused or unclear. Irrelevant information, no transition between ideas. Unclear conclusion.
Academic integrity and Appropriate use of referencing	Sources and citations are carefully chosen to concisely support the work, and the IEEE referencing system is used skilfully and effectively.	Others' work acknowledged in-text and/or with citations. Uses IEEE referencing system consistently and correctly.	Other sources appear to be acknowledged. Uses IEEE referencing system but with occasional errors or omissions.	Work appears to be not adequately referenced or attributed. Does not attempt to use IEEE referencing system.