United International University
Department of Computer Science and Engineering
SOC 2101: Soc., Tech. and Engg. Ethics   Final Exam. : Fall 2023

Total Marks: 25   Time: 1 hour 30 minutes

Any examinee found adopting unfair means will be expelled from
the trimester / program as per UIU disciplinary rules.

Answer all the 5 questions. Numbers to the right of the questions denote their marks.

1. John is a member of a drug manufacturing company specializing in creating a drug for painless death. Their primary customer is a country where euthanasia is practiced and legally supported by the law. Euthanasia is the practice of ending the life of a patient to limit the patient's suffering. About 75% of the population of that country supports this practice. In the beginning, mainly patients with terminal diseases were given this. But after a reform in the law in recent years, the law now also supports giving this treatment to people with severe depression. The doctors first try to cure the depression through proper medical practice. But if that doesn't work then a medical board decides whether the person is eligible for this after a thorough examination. Many argue that no living person has ever died and this practice might promote suicide. It's only through death we can ever know what it feels like. So, we can't be sure if this assisted suicide is painless. Analyze the above scenario using the ACM Code of Ethics, stating with reason which of the laws are being followed and which of them are being broken.

   [5]

2. Imagine a university implementing a machine learning system to predict student performance and identify individuals at risk of academic probation. The system analyzes various factors, such as attendance, grades, extracurricular activities, and even social media behavior, to generate predictions. The university intends to use these predictions to provide targeted support and interventions for struggling students. As a student studying machine learning ethics, identify potential ethical violations in this approach and discuss the implications of using such a system. Consider issues related to privacy, fairness, bias, and the unintended consequences of relying on machine learning predictions for academic decisions. How might the use of social media data and other sensitive information impact the ethical considerations of this system? Additionally, propose alternative approaches that prioritize ethical considerations while still aiming to support students in need.

   [5]

3. In a futuristic project called "Project Uplift," Instagram, using the help of AI and a team of team of psychologists and Human–computer interaction (HCI) researchers, quietly watched and gathered information from 4,000 users who shared sad moments on the platform. The social media giant proceeded to explore what kind of content brought joy to these individuals during happier moments. In a distinctive experiment conducted in September 2024, Instagram introduced a feature where, upon detecting a user's post expressing sadness, AI would step in. In a bid to turn frowns into smiles, the AI generated personalized, uplifting content based on the user's preferred themes and styles identified during the research phase. The outcomes were remarkably positive, with users reporting increased happiness and a notable upswing in Instagram usage. Instagram later shared the details in a talk about success of "Project Uplift" underscored the potential of using AI.

   Which ethical concerns do arise in Instagram's research and measure should Instagram have taken before such a research project?   [5]

4. Mariam is a computer engineer who has recently worked on developing an app which helps users keep track of medical information, doctor's appointments, and prescriptions. Information about the user is stored in this app, including what prescriptions they are taking and how frequently they schedule doctor's appointments. As the developers of the app, Mariam and her company have access to this information. The marketing department requests Mariam to supply them with customer-specific information so they can better target ads and app suggestions to the users. At the same time the data analytics department in the company asked the developer team to provide patient data so that they are able to study the demographics of their users' behavior and usage and publish aggregated results on scientific journals. Mariam understands that targeted apps and suggestions could increase the company profit, but also feels that the privacy of the app users should be protected. Additionally, Mariam feels that as an engineer, she should be responsible to those who use her technology. Furthermore, if research is conducted on user behavior it can be used to enhance the experience of the user's too. In this situation propose a framework that enables Mariam to determine how much of the user's information should be shared with marketing and analytics departments? What steps can be taken to ensure that this process is an ethical use of information and not a violation of the user's privacy?   [5]

5. Assume you work for S.H.I.E.L.D., a global organization specializing in superhero technology and defense against extraterrestrial threats. As part of a new initiative, S.H.I.E.L.D. is determined to reduce its environmental impact

and enhance sustainability practices while maintaining operational efficiency. As a member of the technology development team, your mission is to identify potential environmental impacts of advanced superhero technology and devise strategies to mitigate them. Your focus is on the entire life cycle of the organization's cutting-edge gadgets, from creation to disposal, with a particular emphasis on minimizing technological waste. Leveraging your knowledge of superhero tech, environmental science, and cost optimization, outline potential environmental impacts, propose mitigation strategies, and suggest cost-effective ways to reduce technological waste in the superhero realm.

[5]