



United International University
Department of Computer Science and Engineering
SOC 2101: Soc., Tech. and Engg. Ethics Final Exam. : Spring 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. Mr. Ross Geller is a Final year Undergraduate student doing his thesis in the domain of Natural Language Processing and Social Media Analytics. His topic is “Identify Cyberbullying and Offensive posts from Social Networking Sites (SNS)”. He wants to collect Social Media data of 10,000 Facebook users and utilise it to train the model. He gathered the data by scraping the site which means he didn’t used any consent forms. He later posted the data set in forum to discuss with like minded people. Later his work was picked up a news site which wrote a article on it which was inaccurate. Mr Geller tried to clarify the situation.

List the violated IEEE codes of ethics and what can be done minimize the violations.

[5]

2. In 2014, Facebook conducted a study in which it manipulated the news feeds of over 600,000 users to see if it could affect their emotions. The study, titled ”Experimental evidence of massive-scale emotional contagion through social networks,” was conducted by researchers from Facebook, Cornell University, and the University of California, San Francisco.

The study involved randomly selecting Facebook users and manipulating the emotional content of their news feeds for one week in January 2012. Some users were shown more positive content, while others were shown more negative content. The researchers then monitored the users’ own posts to see if they exhibited emotional contagion, meaning if their moods would be affected by the emotional content they were exposed to on their news feeds.

The study found that users who were exposed to more positive content were more likely to post positive updates themselves, while users who were exposed to more negative content were more likely to post negative updates themselves. The study caused controversy when it was revealed that Facebook had manipulated users’ emotions without their consent.

Now, explain how Facebook exploits the vulnerable populations in their research. Which ethical concerns do arise in Facebook’s research?

[5]

3. The Chernobyl disaster was a nuclear accident that occurred on 26 April 1986 at the No. 4 reactor in the Chernobyl Nuclear Power Plant, near the city of Pripyat in the north of the Ukrainian SSR in the Soviet Union. Called the world’s worst-ever civil nuclear incident.

The accident destroyed the Chernobyl 4 reactor, killing 30 operators and firemen within three months and several further deaths later. The accident occurred during a safety test meant to measure the ability of the steam turbine to power the emergency feedwater pumps of an RBMK-type nuclear reactor in the event of a simultaneous loss of external power and major coolant leak. During a planned decrease of reactor power in preparation for the test, the operators accidentally dropped power output to near-zero, due partially to xenon poisoning. While recovering from the power drop and stabilizing the reactor, the operators removed a number of control rods which exceeded limits set by the operating procedures. Upon test completion, the operators triggered a reactor shutdown. Due to a design flaw, this action resulted in localized increases in reactivity within the reactor. That brought about the rupture of fuel channels and a rapid drop in pressure, thereby prompting the coolant to flash to steam. This caused the reactor 4 to go critical.

The Chernobyl accident was the result of a flawed reactor design that was operated with inadequately trained personnel.

Write case-study on the above scenario considering IEEE code of ethics.

[5]

4. Assume you work for a large tech company that specializes in manufacturing and selling computers and other electronic devices. As part of a new initiative, the company is seeking to reduce its environmental impact and improve its sustainability practices while also minimizing production costs. As a member of the team responsible for developing this initiative, you are tasked with identifying the potential environmental impacts of computer technology and devising strategies to mitigate them. In particular, you are asked to consider the impact of the entire life cycle of the company’s products, from manufacturing to disposal, with a focus on reducing e-waste. Using your knowledge of computer technology, environmental science, and cost optimization, outline some of the potential environmental impacts of computer technology, propose some strategies that your company could implement to minimize those impacts, and also suggest some cost-effective ways to reduce e-waste.

[5]

5. Andrea Pirlo a machine learning expert works for a sports data analytics company that has developed an AI-powered model to predict the winner of the FIFA World Cup. However, it has recently come to light that the model has a bias due to the data used to train the model it had results from previous FIFA World Cups from 1934 to 2018. The data used to train the model has been found to be biased towards certain countries, leading to incorrect predictions and unfair advantages for certain teams. As a member of the team responsible for developing and maintaining the AI model, Pirlo is tasked with finding a solution to remove the bias and ensure that the model provides accurate and fair predictions for all teams participating in the World Cup. What kind of bias is introduced here? Explain your answer with solution.

[5]