Explore – Impact of Computing Innovations
Written Response Submission Template

Please see Assessment Overview and Performance Task Directions for Students for the task directions and recommended word counts.

Computational Artifact

2a)

> My computational innovation is AI-based predictive analytics in Cancer Treatment. The purpose of my innovation is to aid doctors to accurately diagnose cancer in patients.
> The main function is to calculate the probability that an individual will get various types of cancer. The AI compares an individual's genome file to the genome files of numerous cancer patients with varying types of cancers.
> My computational artifact shows the function of my innovation by noting input, data transformation process, and output. Illustrations and words are combined to explain this process.

2b)

> I used google slides to create my computational artifact. I added words to describe the purpose and function of my innovation. Next, I added colors and shapes behind my words for aesthetic reasons. After numerous attempts, I decided what size, font, and style my heading, subheadings, and text should be. Finally, I made all the images to enhance my text. The images are a combination of shapes created in slides with the shapes tool. The images were designed based on their depiction of the information in the corresponding text.

Computing Innovation

2c)

> A beneficial effect of AI-based predictive analytics is that this software can aid in diagnosing rare or abnormal illnesses. According to Business Insider, "researchers at the University of North Carolina... used IBM Watson's Genomic product to identify [rare cancers]...for over 1,000 patients...with genetic abnormalities"(Phaneuf). This new software will allow doctors anywhere to diagnose rare cancers rather than referring to a specialist. The latter is expensive.

The AI's impact on society is that it can allow greater access to quality cancer healthcare to the lower class, increasing the well being of mankind. This is done by reducing the cost of cancer care by allowing regular doctors to treat rare cancers and help develop new treatments.

However, a negative effect is the data an AI uses can be flawed or biased, since that may be the only data set available, causing a misprediction. Healthitanalytics.com claims, "Flawed or biased underlying data can result in faulty learning and generate erroneous outputs"(Sokol). This bias in data provided to the machine can lead to misdiagnosis of patients and possible complications as a result of the wrong treatment.

2d)

AI predictive analytics uses text and numbers to operate.

The input is an individual's entire genome in the form of DNA. DNA is made of 4 nucleotides called adenine(A), thymine(T), guanine(G), and cytosine(C). The letters are converted into binary code and are sent to the database. The database uses logic with transistors to look for similarities in genomes. These similarities are then counted up for severity and length and a percentage is derived as to how likely the individuals will get that type of cancer. The process is repeated for each type of cancer. In the end, a diagnosis of the individual is outputted by the AI.

Although AI predictive analytics is beneficial, it can lead to privacy loss if misused. If the AI machine's diagnosis of an individual is leaked, this person may lose the option of privacy regarding their illness. Healthitanalytics.com says, "American doctors indicated more concern around data privacy [when asked if AIs will replace them]" (Kent). In the society we live in, One's illness is one's business and considered private information. Most value the choice to share this information with who they want and when they want. Also, the metadata, including names, of the genome files of cancer patients in the database can be leaked, depriving those individuals of privacy. If programmers can protect the machine from cyberattacks, this program can revolutionize cancer treatment.

References

2e)

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Phaneuf, Alicia. "AI and Machine Learning Are Changing Our Approach to Medicine and the
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