

**School of Computer Science and Statistics**

**Individual Assessment Submission Form**

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| **Lecturer(s)** | Prof Dave Lewis, Prof Vincent Wade |
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| **Student Name** | Ayomide Korede Okubanjo |

**Assignment Submission Declaration:**

I have read and understand the plagiarism provisions in the General Regulations of the University Calendar for the current year, found at: <http://www.tcd.ie/calendar>

I have also completed the Online Tutorial on avoiding plagiarism ‘Ready, Steady, Write’, located at <http://tcd-ie.libguides.com/plagiarism/ready-steady-write>

I declare that this assignment, together with any supporting artefact is offered for assessment as our original and unaided work, except in so far as any advice and/or assistance from any other named person in preparing it and any reference material used are duly and appropriately acknowledged.

Any use of Chatbots/Generative AI tools in researching the materials research for this report is fully described at the end of the report. I confirm that no text produced by such tools has been directly used in the report.

Signed ……………Ayomide Korede Okubanjo………… Date ………1st April 2024………

Description of use of Chatbots/Generative AI tools:

…………………NONE………………

**Description of the application (Google Gemini AI)**

Google Gemini is a generative AI which makes use of a large language model to interpret and respond to user inputs. It was created by google DeepMind in response to the open AI chat GPT. The Gemini was released in December 2023. Since its launch it has gained attentions of various users from different field of work. Gemini currently has three different sizes Gemini Ultra: which is the most sophisticated model for complex tasks, Gemini Pro: this is a free version of the Gemini AI, Gemini Nano: this is the version of the Gemini Ai created for running on device task. This nano version is currently being used in the google pixel 8 pro smartphones. Gemini is developed to process and generate text based on information received from users. It is a multimodal AI model which can respond to a wide range of content including texts, audios, videos, and codes. It multimodal features allows it to interpret, text and pictures. That makes its possible for it to combine different images, process it and create new ones, and generate piece of writing as well as programming codes. The wide range of ability that the Gemini possess make it possible for it to be used for different function by different individuals from various fields.

**Benefits of Gemini**

Gemini helps to improve productivity of workers. The use of Gemini has been adopted by different companies to help improve the efficiency of workers in the workplace. The ability of the Gemini ultra to perform more sophisticated tasks such as ability to write programming codes and ability to engage in complex reasoning has made it a reliable asset to be employed by businesses. Some other benefits include increase in automation of work task in different fields (sophisticated reasoning), reduction of cost for employers as well as increase efficiency and productivity. In addition, Gemini can be used as a base for more advanced coding system with the presence of the more advanced code generation system called alpha code 2.

**Stakeholders Roles**

**Providers**

These are the people involved in the creation, development, and funding of the Gemini. They include the investors, management team and employees like software developers. Their role includes the following:

* Ensuring that they create a reliable and trusted AI that meets the needs of the users.
* Ensuring that Gemini meets all legal requirements of generative AI models. They ensure Gemini does not violate any legal requirement put in place by the AI regulatory bodies in different regions.
* Ensuring the safeguarding of all data being collected by Gemini. It is the duty of the developers the owners of Gemini (google) to ensure that data been collected by Gemini are being properly protected and ensure that it does not go against any data privacy laws.

**Consumers/Users of Google Gemini**

This set of stakeholders includes people who make use of the Gemini for their different needs which range from generating writing text, images, and programming codes. These users include individual users or businesses.

* They make use of Gemini for automation of work task and brainstorming of ideas.
* They use Gemini to generate write ups, images, and videos.
* They use Gemini to summarize and find quick information in their devices (Gemini Nano).
* Learn new information using Gemini by engaging in open ended back and forth conversations.

**Regulators**

This set of stakeholders include regulatory bodies and individuals that are charged with the responsibility of regulating the creation and usage of all sorts of AI. They include the government of different countries, specially created regulatory bodies etc.

* They regulate policies regrading the development and usage of generative AI. It is the responsibility of regulatory bodies to come up with legal requirement to make the creation and use of generative AI safe.
* They ensure Gemini meets all ethical requirement. All ethical concerns should be held with equal importance, and they should ensure that the Gemini and all other generative AI meet these requirements.
* They make sure Gemini don’t violate laws regulating AI data usage.

**Ethical risk of Gemini**

**Human rights**

**Data privacy violation**

The breach of data privacy is a major ethical concern with the Gemini and other generative AI system as these LLM system are trained on large data sets which sometimes include personal identifiable information of people. A breach of this data privacy could lead to the violation of the individuals human right to privacy and can trigger legal consequences for the company. This could also bring about loss of trust in Gemini by users. Although there is a very low probability of this happening its still a major concern for users.

**Deep fakes**

The ability of Gemini to create perfectly made content that can hardly be differentiated from originals is a major ethical issue. To think that this content could easily be generated by a text prompt from human makes it a bigger issue. The continuous unethical creation and use of deepfakes by harmful individuals increases the quantity of untrusted information in circulation. This leads to a problem of information filtering; it makes it difficult for people to identify which information is right or wrong. There is a higher change of this occurring as it can easily be generated by individuals.

**Labour practices**

**Workforce displacement**

The capability of Gemini to perform human work (such as writing, coding, content creation and so on) more effectively and quickly has become an ethical issue with fear that human will get replaced. As companies continue to invest in this AI and more work roles get automated workers continue to fear that their jobs would get taken over by this generative AI.

**The environment**

**Carbon emission**

Generally generative Ai is said to consume large amount of energy both during their learning stage and as they become widely used by consumers. Although the carbon footprint of newer version of generative AI like Gemini have not been closely studied yet, it has been noted that early similar version like the BERT models emit roughly the same as one person’s round-trip flight on a plane.

**Fair operating procedures**

**Copyright infringement and litigation**

Generative AI such as Gemini need many data set from different sources to be trained. Some of this data may include copyrighted intellectual properties of other creators being used without their knowledge. It is possible that some generated AI (Gemini) are being used by businesses for generating ideas, some of the ideas which may include images and coding generated by this AI could have been gotten from copyrighted property. This could put user at risk of litigation by original owners of this ideals, image, or write ups.

**Consumer issues**

**Chances of bias**

There are chances that AI model can be bias. As AI models are being trained with large data which may include bias and stereotypes about certain group of people. There are chances that this AI models inherit and perpetuate these biases toward certain group of people. Although there is a very low chance of this happening with Gemini as google indicated that the data in which Gemini is been trained with has been sorted by professional from various ethnic backgrounds. Although it we cannot be certain that all sort of bias has been completely removed.

**Mitigation measures for deepfakes**

The use of deep fakes is an increasing issue with the emergency of generating AI such as Gemini and is considered as one of the most severe ethical implications of Generating AI model. The easy access to tools used for creating deepfakes has given rise to the increasing amount of deepfakes in our current world. This calls for an immediate intervention of the government and AI development companies to implement measures to help mitigate the continuous creation and distribution of deepfakes. Both the government and AI development companies need to invest in the development of tools that can identify fake content as well as educating user and the public on ways to identify deepfakes to reduce the distribution of misleading information. Some already existing tools used for the identification of deepfakes include:

* The use of forensic analysis. The use of forensic analysis helps to analyse inconsistences in deepfakes which are not present in original medias such as anomalies in audio and visual elements, lightening, facial and body movements.
* Use of counter AI algorithm: with the help of counter AI algorithm which are trained with data sets of both authentic and fake media, discrepancies between deepfakes and authentic content could be identified.
* Government policies and legislation: Government in some regions have put in place policies and regulations that address deepfake as well as punishing individuals involved in the intentional creation and distribution of deepfakes.

While all this are in place both government and Generating AI development companies need to keep developing counter measures to address deepfakes as more and more sophisticated generating AI models that can evade the existing ways of detection of deepfakes are being created.

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