UTS RM

Essay Individu

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1. <u>**Personal Alignment with the Group Project**</u>
   a. **Why is this research topic meaningful to you personally?**

      This research topic is very meaningful to me personally because hallucinations in AI-generated content especially in scientific writing, are a critical issue. In academic and scientific work, accuracy and reliability is very crucial because any false information can damage the credibility of research. As AI is increasingly used to generate scientific papers, it's important to address these hallucinations to ensure the content factual and accurate. By studying about how the STORM framework can help reduce these hallucinations, this research has the potential to make a significant contribution to the world of technology. Since scientific writing is foundational to the advancement of knowledge, technology and innovation, ensuring AI-generated content meets these standards will help accelerate these progress significantly.

   b. **How do your own interests, prior experiences, or career goals intersect with the group's chosen research problem?**

      For me personally, based on my experience on using LLM like ChatGPT to generate AI content for studying and tasks. Often, I've encountered hallucinations where the model creates references that don't exist, which could lead to significant problems for me and other people if they don't verify the content further. This issue is especially critical in scientific writing, where accuracy is essential. My interest in finding solutions like the STORM framework aligns with my goal of improving the accuracy and reliability of AI-generated content, making it more trustworthy for academic and research purposes.

2. <u>**Analytical Insight**</u>
   a. **Select one key insight or concept from each of the following sessions—1, 2, 3, 4, 5, 6, 7— that has most influenced your understanding of research design and execution.**

      The key insight that has most influenced my understanding of research design and execution from each sessions are:

   1. Session 1: Research Lifecycle, it helps me to understand the research process by breaking it down into clear and manageable steps. By following this structured approach, I can ensure that each phase of my research, starting from idea generation to dissemination, is well-organized and purposeful.

   2. Session 2: Refining the Research Problem, this process helps me to define a clear, focused and manageable research question by conducting a literature review, setting specific objectives and applying the SMART criteria, It ensures that the problem is relevant and achievable so the research process will be more structured and effective.

3. Session 3: Steps in Conducting a Literature Review, this process is essential in establishing a strong foundation for research. By defining the research scope, searching for relevant literature and organizing the sources, I can identify gaps in knowledge and opportunities for further research. These steps provide a structured approach to reviewing a literature, so it making it easier to develop a focused and well-informed research problem.

4. Session 4: Developing a Theoretical Framework, this framework provides a structured way to approach a research problem by explaining why it exists and how different concepts and variables interact. It serves as the foundation for defining research questions, guiding data collection, and analyzing results. This approach not only enchances the clarity and focus of the research but also helps align the study with theoretical perspectives, improving its credibility and methodological rigor.

5. Session 5: The Steps in Research Methodology, this process includes clearly defining research objectives, choosing the right method (qualitative, quantitative, or mixed methods), and following a systematic approach for data collection and analysis. Data analysis techniques such as statistical analysis, or using machine learning models are crucial for drawing a valid conclusions. This structured methodology guides the research process, ensuring validity and accurate results.

6. Session 6: Data Cleaning and Preparation, this phase is critical when handling data. As it ensures that the data used for analysis is accurate and consistent. Specifically, methods like handling missing data, outlier detection and normalization are essential to prepare the data for reliable analysis.

7. Session 7: Structure of A Proposal Presentation, a well-structured proposal presentation helps clearly communicate the research idea, objectives and methodology to audience. This structure ensures that the presentation is comprehensive, focused and effectively conveys the research plan, making it easier to gain approval, feedback, or funding. Additionally, common problems in presentations, such as nervousness, technical issues, and difficult questions, can affect the overall effectiveness. Nervousness can be reduced through thorough practice and relaxation techniques, while technical issues can be avoided by testing equipment beforehand. Handling difficult questions with professionalism, acknowledging when unsure, and offering to follow up later can ensure a smooth and confident delivery, boosting the presentation's impact.

b. **For each session, briefly describe how you have applied (or plan to apply) that insight in your group's project. You can reference lecture notes or reading materials.**

1. Session 1: For our project, I will use the research lifecycle to structure my work systematically. From idea generation to dissemination, I will ensure that each stage is purposefully executed. By following this structure, me and my group can stay organized and

focused, making sure we thoroughly address our research problem and effectively communicate our findings.

2. Session 2: I will use the SMART criteria to define and refine our research problem, ensuring that the research question is clear, specific, measurable, achievable, relevant, and time-bound. Through a literature review, we will identify knowledge gaps and refine our focus, which will help streamline our research objectives and ensure the problem we are addressing is relevant and manageable.

3. Session 3: I will apply the steps in conducting a literature review by first defining the scope of our research and then searching for relevant literature using databases like Google Scholar. By organizing sources and identifying gaps, we can position our research within the current body of work, highlighting where our study can contribute new insights.

4. Session 4: For our project, i will develop a theoretical framework that explains the key concepts and relationships relevant to our research question. This framework will guide our study design, help us align our research objectives with existing theories, and provide a solid foundation for data collection and analysis, ensuring the credibility and methodological rigor of our work.

5. Session 5: I will apply a systematic research methodology by clearly defining our research objectives, choosing a suitable method (likely mixed methods), and using appropriate tools for data collection (surveys, experiments). I will also ensure that we follow a structured approach for data analysis, using statistical techniques or machine learning models to draw accurate conclusions.

6. Session 6: I will prioritize data cleaning and preparation to ensure the accuracy and consistency of the data. This will involve handling missing data, detecting outliers, and applying techniques like normalization to prepare the data for analysis. Proper cleaning will enhance the reliability of our results and ensure that our analysis is valid.

7. Session 7: For this project, me and my team will structure our proposal presentation to clearly communicate the research problem, objectives, and methodology to our audience, following the outlined structure (introduction, literature review, research questions, methodology, expected outcomes, etc.). We will also prepare for common presentation issues, such as nervousness, technical difficulties, and difficult questions by practicing thoroughly and ensuring that we can handle any challenges with professionalism and confidence.

3. **Critical Reflection**
   a. **Discuss any challenges or gaps you've identified in your group's current approach. What specific steps do you propose (as an individual) to strengthen the project moving forward?**

   A significant challenge that me and my group's current approach is that STORM is da relatively new framework, which makes it difficult to find sufficient references or literature that fully explain its implementation or effectiveness. This limited availability of established research on STORM poses a challenge in contextualizing our project and ensuring that our methodology aligns with previous studies that have been validated. To address this, I have

already consulted with my senior lab assistant, Christoper Alden Anugrah Silitonga who is currently interning at Samsung. He has experience working with STORM and provided my team with valuable insights into its application. Additionally, i personally also explore related frameworks like Retrieval-Augmented Generation (RAG) and other multi-agent systems that share similarities with STORM. Since documentation about STORM is rare, I hope with this research paper, we can contribute to advance the development of STORM in the future and can continue to improving the quality of AI-generated content in academic and scientific fields.

b. Reflect on how you will use the skills from Sessions 1–7 to address these challenges and enhance the final outcome.

To address the challenges and enhance the final outcome of our project, I will draw upon the skills from Sessions 1–7, which will help guide our approach and ensure the success of our research.

Starting from session 1 based on the research lifecycle, I will ensure that our research is structured systematically, with each phase purposefully executed. This approach will help us stay organized and focused, even in the absence of extensive resource on STORM.

From session 2, I will refine our research problem using the SMART criteria to ensure that our research is specific, measurable and achievable. This will help us maintain clarity and focus, even when we encounter gaps in literature.

From session 3, I will conduct a comprehensive literature review. Although STORM sources are limited, I will use this phase to review related frameworks and identify where our work can contribute new insights. By organizing the literature and identify the gaps, i can ensure that our methodology is informed by the most relevant studies.

From session 4, I will apply the theoretical framework development process to help justify the use of STORM in our research. This framework will guide the data collection and analysis, ensuring that the approach aligns with the theoretical grounding of AI-based content, even when the references are sparse.

From session 5, by following the systematic research methodology, I will ensure that our research objectives are clearly defined and the methods are applied appropriately for data collection and analysis, relying on techniques like statistical analysis or machine learning models to validate the effectiveness of STORM.

From session 6, I will focus on data cleaning and preparation to ensure that the data we use for our research is accurate, consistent and properly formatted for analysis. This will be critical in maintaining the reliability of our results, especially working with limited references.

Finally from session 7, I will structure our proposal presentation to clearly communicate our research problem, methodology and expected outcomes. Despite the challenges posed by limited references, I will ensure that the presentation is focused and well-organized, making it easier to communicate our findings and potential contributions to the field. We will also prepare for prepare for common challenges in presentation such as nervousness and technical issues, ensuring a smooth and professional delivery.

By applying these skills, I believe we can address the challenges posed by the lack of STORM literature and ensure that our research not only advances the development of STORM but also contributes to improving AI-generated content in academic and scientific fields.