DIGITAL OUTLET

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CCET ACM STUDENT CHAPTER
CCET, DEGREE WING ,
SECTOR 26 CHANDIGARH

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A NOTE FROM OUR MENTORS

Our mission at CCET is not only to produce engineering graduates but to produce engineering minds.

Dr. Manpreet Singh
Principal CCET (Degree Wing)

ACM CCET provides student a great opportunity to learn scientific and practical approach of computer science.

Dr. Sunil K. Singh
Professor and HOD, CSE | Faculty Mentor

Every person should be provided with an opportunity to learn and explore the field of computer science.

Dr. Sudhakar Kumar
Assistant Professor, CSE | Faculty Sponsor

CCET ACM Student chapter is a group of people with similar interests and goals in computer science. Together, this platform focuses on the growth and development at not only personal but professional level also as it has a unique learning environment.

Saket Sarin
UG Scholar, 5th Semester, CSE | Chairperson, CASC

ACM-W Student Chapter of CCET aims to promote women in technology. As a member of this community, you will have the opportunity to collaborate with others who share similar interests and explore different areas of computing in order to advance in them.

Aishita
UG Scholar, 5th Semester, CSE | Chairperson, CASC-W

CCET ACM STUDENT CHAPTER

Research and Development

Student Speaker Program

Competitive Coding

Designing & Digital Art

Internship and Career Opportunity

ABOUT ACM

ACM boosts up the potential and talent, supporting the overall development needs of the students to facilitate a structured path from education to employment. Our Chapter CASC focuses on all the aspects of growth and development towards computer technologies and various different fields. Overall, we at CCET ACM Student Chapter, through collaboration and engagement in a plethora of technical activities and projects, envision building a community of like-minded people who love to code, share their views, technical experiences, and have fun.

We have been trying to encourage more women to join the computing field, so we started an ACM-W Chapter to increase the morale of women. CASC launched an app which aimed at maintaining decorum of reading among CS members and sharing their ideas.

CCET ACM-W STUDENT CHAPTER

Research and Development

Student Speaker Program

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Designing & Digital Art

Internship and Career Opportunity

ABOUT ACM-W

The CCET ACM-W was founded in October 2021 with an aim to empower women in the field of computing and increase the global visibility of women in the field of research as well as development. We provide a platform for like-minded people so that they can grow together and contribute to the community in a way that shapes a better world. Our chapter was founded to encourage students, especially women, to work in the field of computing. The chapter's main goal is to create even opportunities and a positive environment for students, where they can work to develop themselves professionally. We at the ACM Student chapter aim to build a globally visible platform where like-minded people can collaborate and develop in their field of interest.

VISION

Chandigarh College of Engineering and Technology aims to be a center of excellence for imparting technical education and serving the society with self-motivated and highly competent technocrats.

MISSION

1. To provide high quality and value based technical education.
2. To establish a center of excellence in emerging and cutting edge technologies by encouraging research and consultancy in collaboration with industry and organizations of repute.
3. To foster a transformative learning environment for technocrats focused on inter-disciplinary knowledge; problem-solving; leadership, communication, and interpersonal skills.
4. To imbibe spirit of entrepreneurship and innovation for development of enterprising leaders for contributing to Nation progress and Humanity.

DEPARTMENT-VISION AND MISSION

VISION

To produce self-motivated and globally competent technocrats equipped with computing, innovation, and human values for ever changing world and shape them towards serving the society.

MISSION

M1. To make the department a smart centre for learning, innovation and research, creativity, and entrepreneurship for the stakeholders (students/scholars, faculty, and staff).
M2. To inculcate a strong background in mathematical, theoretical, analytical, and practical knowledge in computer science and engineering.
M3. To promote interaction with institutions, industries and research organizations to enable them to develop as technocrats, entrepreneurs, and business leaders of the future.
M4. To provide a friendly environment while developing interpersonal skills to bring out technocrat's inherent talents for their all-round growth

CASC ACHIEVEMENTS

PAPERS PUBLISHED IN IET 2024

CCET-ACM and ACMW provide an environment with an emphasis on research and development, aiming to stay at par with recent trends and innovative approaches in the eld of computer science. Recently, research papers written by some of the bright minds of CASC were published in IET Research, a leading publishing platform by the Institution of Engineering and Technology, focusing on cutting-edge advancements in science, engineering, and technology.

1. SEIR-driven semantic integration framework: Internet of Things-enhanced epidemiological surveillance in COVID-19 outbreaks using recurrent neural networks-By Anureet Chhabra, Sunil K. Singh, Akash Sharma, et al.

PAPER PUBLISHED IN SCIENCEDIRECT 2024

"Navigating the Landscape: Safeguarding Privacy and Security in the Era of Ambient Intelligence within Healthcare Settings" was written by Tarun Vats, Sudhakar Kumar, Sunil K. Singh, Uday Madan, Mehak Preet, Varsha Arya, Ritika Bansal, Ammar Almomani, and published in ScienceDirect on 13 March 2024. The paper explores the challenges of ensuring privacy and security in healthcare settings with the rise of ambient intelligence, proposing solutions to protect sensitive patient data and secure healthcare systems in the face of emerging technologies.

PAPERS PUBLISHED IN RESEARCHSQUARE 2024

CCET-ACM and ACMW provides an environment with emphasis on research and development and aims to be at par with recent trends and innovative approaches in the field of computer science. Recently the research papers witten by some of the bright minds of CASC were published in ResearchSquare is a preprint platform that enables researchers to share their findings quickly, fostering collaboration and accelerating the pace of scientific discovery. The list of selected papers is as follows::

1. Adaptive Stochastic Fault Tolerance for Self-Healing P2P Networks-By Sudhakar Kumar, Shivam Goyal, Sunil K. Singh, et al.

2. Quantum-Resilient Cryptographic Primitives: An Innovative Modular Hash Learning Algorithm to Enhanced Security in the Quantum Era-By Manraj Singh, Sunil K. Singh, Sudhakar Kumar, et al.

3. Transformative Approach for Prediction of Lung Disease Using Lung X-ray Images-By Shrey Mehra, Sunil K. Singh, Sudhakar Kumar, et al.

THE IMPACT OF AI HALLUCINATION ON SCIENTIFIC WRITING

Simran Jaggi [CSE 2022]

Abstract
Artificial Intelligence (AI) is rapidly evolving, transforming various domains, including education, healthcare, and research. One phenomenon gaining attention is AI hallucination—a situation where AI models, such as ChatGPT, generate incorrect or fabricated information that seems plausible but lacks factual accuracy. This article investigates AI hallucination, focusing specifically on its occurrence within the context of scientific writing and research assistance. As AI systems are increasingly used to draft papers, suggest references, and summarize findings, the risk of embedding incorrect or non-existent information in academic work has grown. This paper will analyze the root causes of AI hallucination, explore its implications in academic and scientific domains, and propose potential solutions to minimize its impact. Moreover, we will discuss the potential benefits and applications of AI systems like ChatGPT in assisting researchers, along with the challenges they present. Finally, the article will highlight strategies for mitigating hallucination risks and suggest future research directions to ensure AI-generated content aligns with the demands of academic integrity.

Keywords
AI hallucination, artificial intelligence, ChatGPT, GPT-3.5, scientific writing, content verification, reference inaccuracies, model bias, language models, research automation, hallucination in AI, academic integrity, NLP hallucination, AI ethics, misinformation, citation management.

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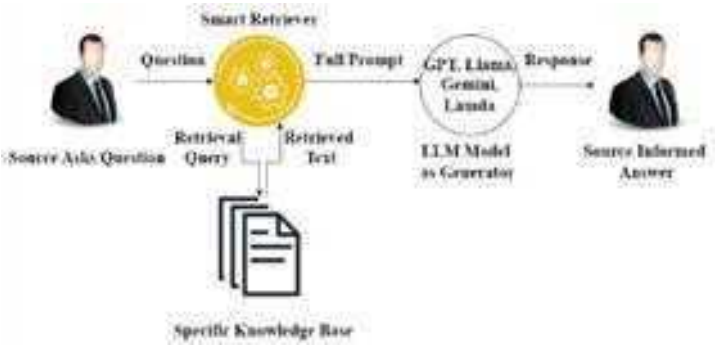
Introduction

Artificial Intelligence (AI) has become a cornerstone technology in modern research, offering groundbreaking applications across various fields. With advancements in natural language processing (NLP) models like ChatGPT, the generation of human-like text has become seamless, providing assistance in tasks such as drafting articles, summarizing research, and offering insights into complex data. Despite these advancements, AI has its limitations, including the phenomenon of AI hallucination. In simple terms, AI hallucination occurs when an AI model produces information that is factually

incorrect or even fabricated, yet it appears highly credible as shown in figure 1 below.



In scientific writing, where the accuracy of information is paramount, the implications of AI hallucinations are particularly concerning. Researchers often rely on ChatGPT and similar models to assist in literature reviews, reference generation, and data analysis. While these tools offer significant time-saving benefits, there is a growing risk that AI-generated text may introduce false information, incorrect citations, or references that do not exist, potentially undermining the credibility of the research.

This article explores AI hallucination in the context of scientific writing, with a focus on the role of ChatGPT and similar AI models. The paper will analyze the causes of AI hallucination, discuss its implications for academia, and present recommendations for addressing this issue. We will also explore the potential applications of AI in research while balancing these benefits with the necessity for stringent content verification and ethical considerations.

Understanding AI Hallucination

AI hallucination refers to instances where AI models, like ChatGPT, generate content that is factually incorrect, misleading, or entirely fabricated. This issue arises due to the inherent nature of AI systems that rely on probabilistic methods to generate text. Language models such as GPT-3.5 are trained on vast datasets, and their responses are based on statistical patterns observed in the training data. When the model is uncertain or lacks specific information, it may "hallucinate" plausible-sounding text that is inaccurate or non-existent.

Causes of AI Hallucination

Several factors contribute to AI hallucination, including training data limitations and inference ambiguities as shown in figure 2

Training Data Limitations: AI models like ChatGPT are trained on large datasets that may contain errors, outdated information, or biases, leading the model to generate inaccurate content.

Inference Ambiguities: When faced with ambiguous or incomplete input, the AI may generate content based on probabilities rather than factual knowledge, increasing the likelihood of hallucinations.

Overgeneralization: AI models often generalize from the training data to generate responses. In doing so, they might create incorrect references, especially in specialized fields like scientific research, where factual precision is critical.

Lack of Verification Mechanisms: AI models do not have built-in fact-check-

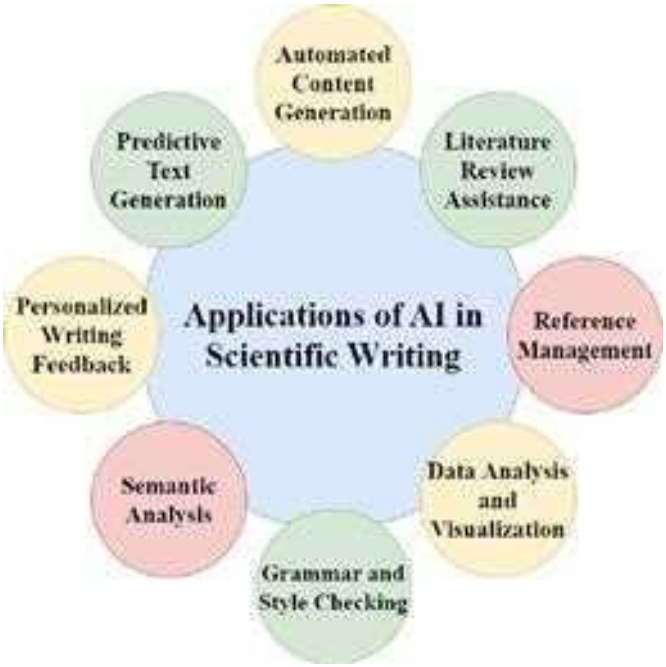
ing systems. Once the content is generated, it is presented as final, with no further validation of its accuracy.

Applications of AI in Scientific Writing
AI has introduced various applications that revolutionize the way researchers approach scientific writing, streamlining multiple stages of the process. Some of the key applications as shown in figure 3 below include:
Automated Content Generation: AI models like ChatGPT can draft sections of research papers, abstracts, or summaries, saving time and providing a framework for further refinement by researchers.

Literature Review Assistance: AI helps in rapidly scanning through vast databases of academic publications, summarizing key findings, and offering insights into relevant research trends.
Reference Management: AI tools can suggest accurate citations based on the content, reducing the manual effort needed to format and cross-check references.

Data Analysis and Visualization:
AI-driven tools can assist researchers in analyzing complex datasets and generating visual representations, which are crucial for data-driven research papers.

Grammar and Style Checking: AI-powered tools ensure that academic writing meets high standards by automatically checking grammar, spelling, and adherence to formal writing styles.



Challenges of AI Hallucination in Scientific Writing
The primary challenge associated with AI hallucination in scientific writing is the difficulty of detecting fabricated or incorrect information. Given that AI models generate highly convincing text, users may find it difficult to distinguish between accurate data and hallucinations, particularly in technical or specialized fields where the user may not have expert knowledge. Another challenge is the time-consuming process of fact-checking AI-generated content, which can negate the time-saving benefits AI systems provide. Moreover, the lack of robust verification tools within AI models exacerbates the issue, as these systems

cannot cross-check their own output against credible sources.

Risks and Ethical Considerations

Misinformation and Academic Integrity: AI hallucination can generate inaccurate or fabricated information, which poses a threat to the credibility of academic research. If researchers unknowingly include false references or conclusions in their work, it can lead to the dissemination of misinformation within the academic community, undermining the integrity of scholarly publications.

Bias in Generated Content: AI models, including ChatGPT, may reflect biases inherent in their training data. This can result in the promotion of certain perspectives, methodologies, or journals over others, which can skew the researcher's work and limit the diversity of viewpoints presented in scientific discourse.
Over-Reliance on AI for Critical Tasks: As AI tools become more integrated into scientific writing, there is a risk that researchers may overly rely on these systems without thoroughly verifying the accuracy of the content. This over-reliance could diminish critical thinking and due diligence, leading to the potential for errors or unethical practices in research.

Mitigating the Risks of AI Hallucination

To address the risks associated with AI hallucination, it is essential to implement strategies that enhance the reliability and accuracy of AI-generated content while ensuring it meets the high standards of academic research. The various ways for mitigating the risks in AI hallucination as described in figure 4 below. One crucial approach is the development of automated verification tools that cross-reference AI-generated content with trusted databases, identifying discrepancies or fabricated references to ensure only accurate information is included in research. However, human oversight remains critical; researchers must manually verify facts, references, and data at every stage to catch potential hallucinations. Enhancing the quality and diversity of AI training data, especially in domain-specific fields, can further reduce the likelihood of hallucinations, while incorporating built-in fact-checking mechanisms within AI models will help flag uncertain information. Transparent user guidelines on the limitations of AI are also necessary to inform researchers that AI tools should be used as an aid, not a sole source of content, thus minimizing the risk of over-reliance on AI in academic writing.

Conclusion and Future Scope

In conclusion, while AI systems like ChatGPT have revolutionized the way

researchers approach scientific writing by offering significant efficiency and productivity benefits, the risks posed by AI hallucination cannot be overlooked. The tendency of AI models to generate incorrect or even fabricated information can severely compromise the credibility and integrity of academic research.

This is particularly concerning in cases where AI is used extensively for reference generation, literature reviews, or even content drafting. When researchers rely heavily on AI without thorough fact-checking and verification, the risk of incorporating inaccuracies increases, potentially leading to the spread of misinformation in academic publications. Therefore, it is crucial to strike a balance between the time-saving advantages offered by AI and the need for meticulous human oversight. vinterpretability, and hallucination detection will be crucial for fostering responsible AI usage. By improving the transparency of how AI models generate content and implementing more sophisticated mechanisms to detect and mitigate hallucinations, developers can create AI tools that researchers can trust with higher confidence. Interdisciplinary collaboration between AI developers, researchers, academic institutions, and policymakers will also play a pivotal role in shaping guidelines for the responsible deployment of AI in scientific writing. These collaborations will ensure that the integration of AI into academia serves to enhance research quality while safeguarding the rigor and accuracy essential to scholarly work.

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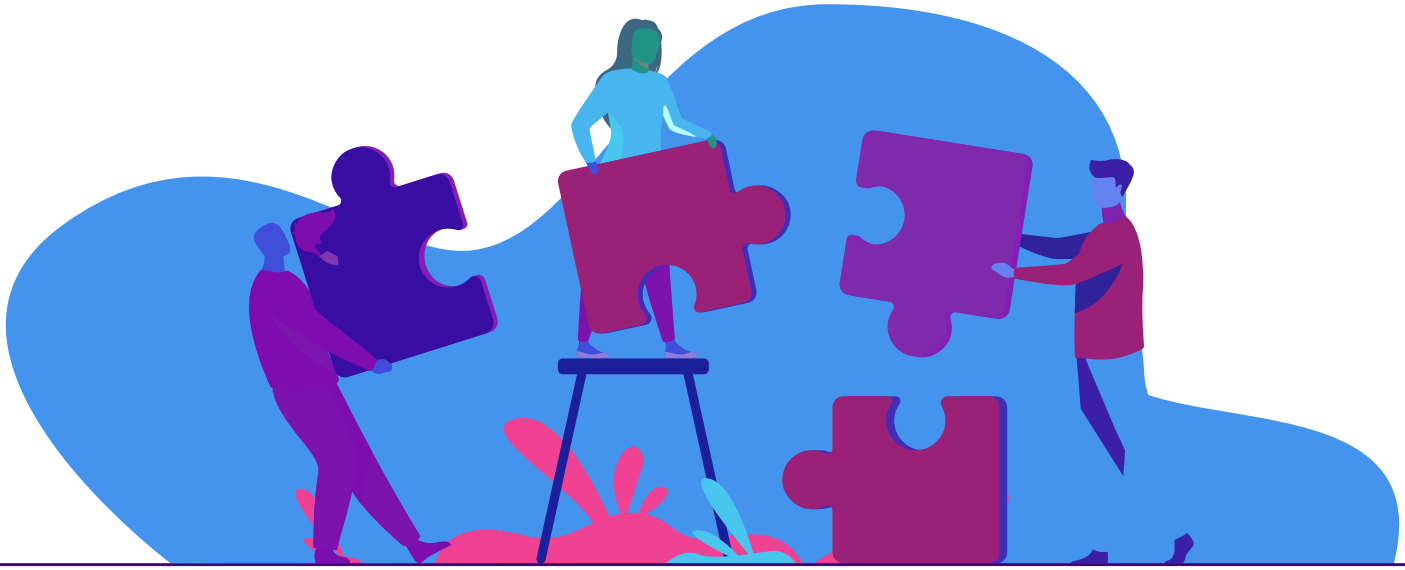

"Scientists explore the mysteries of what exists, while engineers bring to life what once only existed in dreams."

Theodore von Kármán
Pioneering Aerospace Engineer and Physicist

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