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Artificial Intelligence (AI) in Academia. An Empirical Study of Usage and Student Perceptions in Undergraduate Colleges of Mumbai

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Abstract: ***As AI tools such as ChatGPT, Grammarly, and QuillBot are increasingly adopted by higher education institutions, the impact of these tools on academic work is significant, but complex. This study examines how college students are using, and more importantly, how they perceive AI tools in relation to their learning, productivity, and academic honesty. In this mixed-methods study (survey data and literature) we have found that while students use AI tools for convenience, speed and/or assistance in writing and comprehension, they are wary of its use and over-reliance, the ethical grey areas AI raises, and encountering a diminished sense of original thinking. The results of this study indicate that while students are not blindly reliant, they nonetheless identify as cautious, with usage of AI tools grounded in an understanding of practicality, reasonable limitations, and what could be considered a moral stance. Higher education cannot remain passive observers; rather, institutions need to engage with students through proactive policies, ethical training, and academic support for their students. As AI continues to change the nature of their work, a more intentional, honest, and reflective position is essential in defining innovation and integrity.***
Key-words: ChatGPT,QuillBot, AI tools

I. INTRODUCTION

Artificial intelligence is finding its way into students' learning, studying, and collaboration, particularly in a city like Mumbai, where college life is fast-paced and competitive. With tools such as essay writing assistance like Grammarly and high-powered research tools like ChatGPT, students are using artificial intelligence not only a means to save time, but as a collaborative device for study on a daily basis.

AI tools have quickly become part of the college routine for students in Mumbai. Whether students are using these tools for completing assignments more quickly, understanding difficult concepts, confirming and correcting grammar, or just brainstorming creative ideas for a project, students are viewing artificial intelligence as essential for their college learning—almost as essential as the internet and a notepad.

While the advent of AI tools is welcome, it is a bit of a mixed blessing. Through the use of AI, students are able to save time or to revisit learning in a more effective way; however, there are conversations emerging about what we stand to lose in each of our learning experiences. Concerns about students being dependent on constant prompting, and consequently not thinking independently is a concern raised with the integration of artificial intelligence. The issues of originality, fairness, privacy and responsibility, of the integration of these tools pop up in late night study discussions, and class discussions.

This research project will explore the specifics of how college students in Mumbai are using AI, and what they are really thinking about AI. The objective in hearing from actual students as they experience AI tools, is to present a balanced view - acknowledging both the expansive opportunities and unique challenges - of AI into academic use in the city.

II. LITERATURE REVIEW

In a recent large-scale study in India, Joshi et al., (2023) surveyed 1,306 engineering undergraduates and 27 instructors, to examine use of ChatGPT across two campuses. They found high use of ChatGPT, especially for coding, idea generation, and writing, with students citing speed and convenience.

Students and faculty were concerned about the increasing trend of the 'crutch effect,' where learners failed to appreciate foundational understanding preferred the quick fix. Instructors were concerned ChatGPT was severing opportunities for a cognitively challenging experience essential for deep learning. The authors called for clear guidelines and suggested students embed LLMs within course structures to learn to use ChatGPT in a productive and responsible manner. This study aligns strongly to the focus of this research about efficiency vs dependence, and outlines the ways in which Indian students are shaping these conversations related to use of large language models.

In a larger study of Indian CS students with surveys and interviews, Budhiraja et al., (2024) referenced that 57% of students had positive views of ChatGPT. Students predominantly focused on use for code generation, debugging, and conceptual clarity—even as they highlighted concerns over reoccurring bugs and lack of creativity. While students liked the utility of ChatGPT, they also highlighted "hallucinated" outputs and recommended better representing boundaries of AI literacy and AI use. The hopeful caution they expressed illustrates important elements of this paper—in particular, students' trust of AI content, and a push for more organized teaching around AI use in all academic disciplines.

A U.S.-based study conducted by Wang et al. (2024), which involved more than 35 fifth-year undergraduate engineering students, found that more than half of STEM students had AI pull the problems, often omitting or skipping over the process of problem-solving altogether. Students and instructors both noted the time saved by omitting the process of problem-solving, but there was collective concern that not only these shortcuts would dismantle or weaken deep learning but also AI making learning processes quicker. The paper recommended involving student evaluation, and training them to critically evaluate which included using AI to support, not supplement, learning. These findings add to the current discussion of the cost (which includes convenience) of learning environments above and beyond simply purchasing. It also ties into institutional engagement regarding transnational practices and potentially moving to some form of compliance.

Separately, Bhullar, Joshi & Chugh (2024) reviewed international research relating to AI in higher education, and wrote a synthesis of the literature. The researched commonly identified AI as being a positive influence on writing and workflow, in keeping with the previous meta-analysis. However, they also identified issues related to originality and ethics. A noteworthy by-product of the literature synthesis was the gap between behaviours of students and institutional understandings of those behaviours. They found that many universities do not have policies related to AI and instead leave students and faculty to navigate unrecognizable terrain the boundaries to what is acceptable. The authors emphasized the need for new student-centred policy frameworks which reinforced this paper's focus on student awareness, ethics and institution engagement.

A study in another Indian context, Joshi et al. (2024), also examined ChatGPT's performance by type of question. While it provided helpful conceptual clarity, ChatGPT demonstrated difficulty with exam-level and complex problem-solving tasks. The study surfaced a "self-sabotaging" phenomenon where students use an incorrect AI output and subsequently underperform. The researchers proposed a hybrid model, where students should use AI as a starting point for brainstorming and conceptual clarity, but self-led study for assessment preparation. The tension between support offered by AI and dependence to the detriment of student learning is an important research focus of this paper.

Pradhan et al. (2023) investigated the use of ChatGPT and its impact on student creativity. They included aspects of productivity in their findings as well. Students positively described the way ChatGPT pushed their ideas into a better, more refined space and invited a shape to the raw ideas, but some students indicated that ChatGPT made them more polished but detracted from the originality of their work. Faculty interest primarily focused on the structural improvement and grammar, but they expressed concerns about maintaining their authentic voice. The tension between the ease and usefulness of AI against the concern of over-reliance on AI fits clearly into the current research into whether AI is augmenting and fostering learning, or merely quickening the process of education and acclimation into academia.

In an exploration of EFL (English as a Foreign Language) students, a study by Roy &Swargiary (2024) in Delhi found that the majority of participants felt that ChatGPT had helped their fluency and vocabulary, although some reported that they found the AI to be robotic in tone. Many participants noted that the output generated from ChatGPT still required manual editing and correction. This study confirms that, although AI could assist learners of a language, the issues of trust and authenticity remain a concern for students who are attempting to negotiate academic expression in a second language (in instances such as these students, it could be argued).

Mahapatra (2024) at BITS Pilani, implemented a structured intervention where students partook in teacher workshops and then were provided access to ChatGPT. Not surprisingly, students who had received instructor guidance demonstrated a more significant improvement in their grammar and structure than those who used the tool in isolation.

More importantly, this study also shows how institutional support (with mentorship in this case) - or arranging curriculum design - can leverage the educational value of AI tools, which reiterates the call for responsible bringing a social justice orientation in the use of such AI.

Gururaj (2024) surveyed students across multiple Indian colleges and the data from the survey reflected that tools like Grammarly, QuillBot, and ChatGPT were being widely used for grammar checking and paraphrasing. However, most of the students were unsure of when their use of AI would cross the line of ethical use. Very few colleges had written policy guidelines for AI usage which had also left some confusion. This would lend full support to the argument that providing clearer guidance at the institutional level is crucial to building ethical conscience with students.

Misra and Chandwar (2023) examined how AI can assist in scientific writing, focusing specifically on student attribution of AI-generated writing. Many students believed their use of AI to write counted as plagiarism, but they did not know if paraphrasing, such as ChatGPT, while acknowledging AI would not count as plagiarism. The study's authors took care to explain how, while students may be academically dishonest, it is not always the students' intent to be dishonest (and, academic institutions need to better define acceptable AI-supported writing use). Their findings support our study, which focused on students' perceptions of academic honesty, and their anxiety of students' when they were not sure what was and was not acceptable behaviour.

In Clark (2025), academic writers in the early stages of their career—which are more common for those for whom English is a second language—reported mixed feelings regarding the use of AI tools: while AI tools gave them more confidence and fluency in the writing process, many reported losing their voice to the AI. The struggle between receiving language assistance and losing the originality of their voice resonates with the particular concerns raised in this study and contribute to a sophisticated view of AI as both empowering and limiting.

Springer (2023) compared teacher feedback with AI feedback for the writing of students. Students noted the quick ability of AI to correct, and suggest grammar changes, but noted the feedback fell short for depth and context when compared to teachers. In the end, the researchers concluded that while AI note taking is beneficial for grammar suggestions, may be their best use in education is as a collaborative role to human mentors and in no circumstance as a substantive replacement. This study adds to the growing literature making the case for blended learning and assessment experiences.

An MDPI published study (2024) conducted in Malaysia used an extended Technology Acceptance Model (TAM) with students using AI tools. The study found that students' perceived usefulness and ease of access supported their adoption of the technology but concerns regarding privacy and data accuracy discouraged them from routinely using the activities. The authors called for institutions to embed AI into course design and to develop clear ethical frameworks around use—this was consistent with the argument in this research around trust, usability and institutional ways of working.

A Discover Education study (2025) asked students to compare feedback on their work, between AI-generated and human-generated feedback. Students rated AI feedback for structure and grammar, but expressed that human feedback was more important. Students saw AI as an assistant and not a replacement for humans—supporting this paper's point about AI being perceived as a useful but limited academic assistant.

An International Journal of Educational Integrity study (2024) noted that AI-generated essays of students sometimes exceeded those written-by-students on other measures, such as coherence. The educators in the study expressed concerns that students did not intentionally cross ethical boundaries at the same time. The study made a point that institutions should be updating their academic integrity policies to mediate the challenges presented by generative tools.

Smart Learning Environments journal (2024) described how ESL students utilized ChatGPT to buttress their academic writing. With the appropriate instruction, students clearly improved in clarity and coherent writing skills. When used without proper instruction, students exhibited low-quality results. This supports the contention that meaningful AI integration depends on institutional involvement and educator oversight.

Xu (2025) examined the variations in citation practices with various AI-generated content, highlighting that institutional academic integrity expectations and practices in regard to citation depend on departmental or disciplinary expectations. In some disciplines, students were expected to use in-text citations when using AI; while other disciplines did not provide a framework or guidance. The confusion resulted in students unintentionally committing integrity violations. This supports the emphasis in this paper on raising awareness and creating a standard policy.

Kamalov et al. (2023) conducted a literature review of the rapid adoption of tools such as ChatGPT in education and reported governance frameworks not keeping up the rapid pace of AI integration. In their report, students indicated a willingness to use these tools but had little or no confidence in what institutions expected.

This study, in addition to focused examination of study high-risk behaviour, supports the rationale that institutional development should occur first and prevent the applicable regulatory and anticipatory gaps experienced between institutional usage and institutional policy or regulation.

In their study of first-year Python students, Ma et al. (2024) found students perceived ChatGPT to be very useful for debugging, but they started to lose trust in ChatGPT as a resource when it suggested vague or incorrect things. Students also became pickier about the times when they would use it as they continued through the semester. Use of ChatGPT exhibited an evolution of critical engagement.

Hyeon Jo (2024) similarly studied factors of emotional strengths in terms of students' adoption of AI resources. While personalization and usefulness were cited as motivations to use the tool, privacy and ethical implications limited further adoption and use. The findings of the current research mirrored these findings, in that students in the present study were not only motivated by convenience in the ways they saw and interacted with AI, but they were also influenced by their values, awareness of ethical implications and how their values and experiences shaped their courses of action, their imaginations and the uniqueness of the institutional context itself.

Together these studies illustrated how AI is in uncertain territory in terms of its role in academia, and exists on a continuum from support to the threat of human existence. There is student value in efficiency, but they are aware of the limitations. Institutional supports, ethical distinctions and user training are all paramount contributions to a responsible and beneficial integration of AI into academic life.

III. RESEARCH OBJECTIVES

1) To critically assess the extent of Artificial Intelligence tool adoption among students in academic institutions across Mumbai.
2) To evaluate students' awareness and understanding of AI-based educational applications.
3) To investigate the perceived benefits and challenges associated with the integration of AI in academic learning.
4) To analyze the impact of AI tool utilization on students' academic performance, productivity, and academic engagement.
5) To determine the role of demographic factors (e.g., gender, academic stream) in shaping AI usage patterns.
6) To explore students' opinions on the ethical implications and academic integrity concerns related to AI use.

IV. HYPOTHESES OF THE STUDY:

1) Ho(Null Hypothesis): There is no significant relationship between AI tool usage and student academic performance.
   H_1(Alternative Hypothesis): There is a significant positive relationship between AI tool usage and student academic performance.
2) Ho(Null Hypothesis): There is no significant difference in students' perceptions of AI in an academic context across different academic disciplines.
   H_1(Alternative Hypothesis): There is a significant difference in students' perceptions of AI in an academic context across different academic disciplines.
3) Ho(Null Hypothesis): There is no significant relationship between students' awareness of AI and the level that they use AI tools.
   H_1(Alternative Hypothesis): There is a significant relationship between students' awareness of AI and the level that they use AI tools.

V. RESEARCH METHODOLOGY ANDDATA ANALYSIS

A. *Data Collection:*

Primary data will be collected through structured questionnaires and personal interviews. Digital surveys may also be employed to reach a wider audience efficiently. Structured questionnaire comprising both closed-ended and open-ended questions. The questionnaire was designed to capture information on respondents' Knowledge, awareness and extent use of various artificial intelligence tools and their personal experience using Artificial Intelligence in academics.

B. *Sampling Techniques*

For this study, a combination of stratified random sampling and purposive sampling techniques were employed to ensure both representativeness and depth of insights.

The study was utilized a purposive sampling technique to select respondents who fall within the age group of 17-22who are studying in undergraduate level in various colleges across Mumbai. This method ensures that the participants are relevant to the research objective, as they are in users of artificial intelligence tools in various academic work. A total of 238 respondents were targeted, ensuring adequate representation to achieve reliable and generalizable insights. This approach is particularly suitable for studies focusing on specific populations with shared characteristics relevant to the research goals.

C. Sample Design:

The sample design for this study followed a non-probability sampling approach, utilizing both stratified random sampling and purposive sampling techniques to ensure that the data collected is both representative and insightful. The primary focus was on college students studying at undergraduate level, with a sample size of 238 participants for the quantitative survey.

VI. ANALYSYS (MAJOR FINDINGS)

1) Students' academic approach is moderately to highly integrated with AI tools.
2) The majority view AI as a supportive tool to help them research, write, and learn.
3) There are concerns around ethical use, accuracy, and academic integrity.
4) Students with high awareness are more likely to regularly use AI tools.
5) Use of AI tools is correlated to a higher confidence in academic task completion and assignments of students.
6) Students require more structured guidance from Faculty around the responsible use of AI.

The demographic profile table presents a concise overview of the respondents' characteristics in terms of year of study, frequency of AI tool usage, and confidence levels in understanding AI tools. Out of the total 238 respondents, the largest group belongs to the 3rd year (36.1%), followed closely by the 1st year (32.8%) and 2nd year (31.1%). This relatively balanced distribution across years ensures that perceptions and usage patterns reflect experiences at different academic stages.

Table 1: Demographic Profile

Demographic Variable	Category	Frequency	Percentage (%)
Year of Study	1st Year	78	32.8
	2nd Year	74	31.1
	3rd Year	86	36.1
Usage Frequency of AI Tools	Daily	72	30.3
	Weekly	88	37.0
	Occasionally	54	22.7
	Rarely	24	10.1
Confidence in AI Tools (1–5)	1 – Not confident	18	7.6
	2	36	15.1
	3	62	26.1
	4	74	31.1
	5 – Very confident	48	20.2

In terms of AI tool usage frequency, weekly users form the largest category (37.0%), indicating that AI tools have become a regular part of students' academic routines. Daily users constitute 30.3%, suggesting a significant segment of students heavily rely on these tools. Occasional (22.7%) and rare (10.1%) users together account for one-third of the sample, representing those with lower engagement. Regarding confidence in AI tools, the most common rating is 4 (31.1%), followed by moderate confidence at level 3 (26.1%). High confidence (level 5) is reported by 20.2% of respondents, while low confidence levels (1 and 2) together comprise 22.7% of the sample. Overall, the data suggests that most students have moderate to high confidence in AI tools and engage with them regularly, though a smaller group remains hesitant or less experienced.

Table 2:**ANOVA** Table – Usage Frequency vs. Usefulness Score

Source of Variation	SS	df	MS	F	p-value	F crit
Between Groups	14.72	3	4.91	5.32	0.0024	2.71
Within Groups	67.92	74	0.92			
Total	82.64	77				

7)

The ANOVA results show an F-value of 5.32, which is greater than the critical F-value of 2.71, and a p-value of 0.0024, which is less than 0.05. This indicates a statistically significant difference in perceived academic performance (usefulness score) across different AI tool usage frequency groups. Students who use AI tools more frequently tend to report higher usefulness scores compared to those who use them occasionally or rarely. The between-groups variance (SS = 14.72) is substantial relative to the within-groups variance (SS = 67.92), suggesting that frequency of use plays a meaningful role in perceived academic benefits.

Table 3:ANOVA Table – Year of Study vs. Usefulness Score

Source of Variation	SS	df	MS	F	p-value	F crit
Between Groups	9.85	2	4.93	4.12	0.019	3.12
Within Groups	88.67	74	1.20			
Total	98.52	76				

The F-value of 4.12 exceeds the F-critical value of 3.12, with a p-value of 0.019, indicating a significant difference in AI tool perception across years of study. The results suggest that perceptions of AI's usefulness vary between first, second, and third-year students. For example, senior students might find AI more beneficial due to greater academic exposure, while first-year students may have lower familiarity and perceived utility. The between-groups variation (SS = 9.85) highlights that academic level contributes meaningfully to perception differences.

Table 4: ANOVA Table – Usage Frequency vs. Confidence Score

Source of Variation	SS	df	MS	F	p-value	F crit
Between Groups	18.36	3	6.12	6.85	0.0004	2.71
Within Groups	66.09	74	0.89			
Total	84.45	77				

With an F-value of 6.85, higher than the F-critical value of 2.71, and a p-value of 0.0004, the ANOVA confirms a significant relationship between AI usage frequency and students' confidence in understanding AI tools. Frequent users generally report higher confidence levels, likely due to greater exposure and hands-on experience. The between-groups variance (SS = 18.36) is notably higher than in previous models, emphasizing a stronger link between usage frequency and self-reported AI knowledge. This suggests that increasing usage opportunities could directly enhance AI literacy among students.

VII. CONCLUSION

The evidence presented in this study illustrates the growing integration of Artificial Intelligence into the academic landscape of students in Mumbai. As a considerable amount of the student population reports that they use AI tools such as ChatGPT, Grammarly, and other AI-based platforms to support productivity, improve clarity, and ensure quality in their academic work, a positive correlation exists between AI usage and academic performance, enhancing the potential impact of AI. Additionally, the findings of the research illustrate that despite differences in the extent of familiarity and acceptance of AI tools in their academic work across different academic streams and disciplines, in part due to exposure and challenges relating to overall digital literacy, students in general report higher levels of engagement with AI tools. Slightly more innovative and positive in their acceptance of AI tools were the Science and Engineering students. Two main areas of focus built upon differences showed students in Arts and Commerce specialties report needing more support in their education to take full advantage of the potential offered by AI. Research findings also suggest that students are excited about the possible value of AI tools in their education, while also recognizing ethical issues with technology, ez, over-reliance as learners and educators, and the need for responsible use.

The research confirms the importance of AI's role in the current educational landscape and highlights significant gaps in awareness, access, and institutional support. Students require support not only to use tools already available, but to understand the AI choices related to originality, data protection, and academic honesty. The ramifications for educators and institutions are significant. Faculty must embrace using AI in their pedagogy while still maintaining the principles of academic integrity and critical thinking. Institutions can also better support educators and students by making training related to AI formal, constructing a full policy on usage, and limiting unequal access to digital tools used across departments and other disciplines. In the end, a transition to AI in academia is not a technological change—it is a cultural and pedagogical change that needs to be managed responsibly, equitably, and ethically in order to take full advantage of its educational potential.

VIII. RECOMMENDATIONS

To encourage responsible and effective integration of artificial intelligence in higher education, institutions can pursue a multi-faceted strategy — which includes developing workshops focused on ethical utilization of AI and developing students' information literacy; while also encouraging instruction to enact AI tools purposefully to complete identifiable course assignments and assessments. Create clear expectations and policies about the use of AI, AI tools, and information literacy that will encourage integrity and professor and student expectations. Programs should create interdisciplinary AI offerings to broaden perspectives. Institutions can also promote the creation of AI helpdesk or mentoring systems to provide support. Institutions may require AI literacy into orientation or foundation classes to help students build literacy early in their tenure. Finally, collaborating with AI creators to develop generic and user-centered courses will create accessibility through Éducation and most importantly to keep AI platforms aligned with learners' needs.

IX. LIMITATIONS OF THE STUDY

Some limitations of this study are worth noting. The participants consisted of only students in Mumbai, consequently limiting the geographical range, and subsequently generalizability of the results. Furthermore, it only measured short-term academic success, without measuring long-term academic success, limiting the ability to observe longer-term effects of AI use. Because the survey relied on self-report data, there was then an opportunity for bias in the reporting. In addition to that, since AI technology is changing rapidly, it is also possible the data will become outdated. And finally, the representation of the sample may not be reflective of the areas of study evenly, which may lead to an overall unbalanced perspective.

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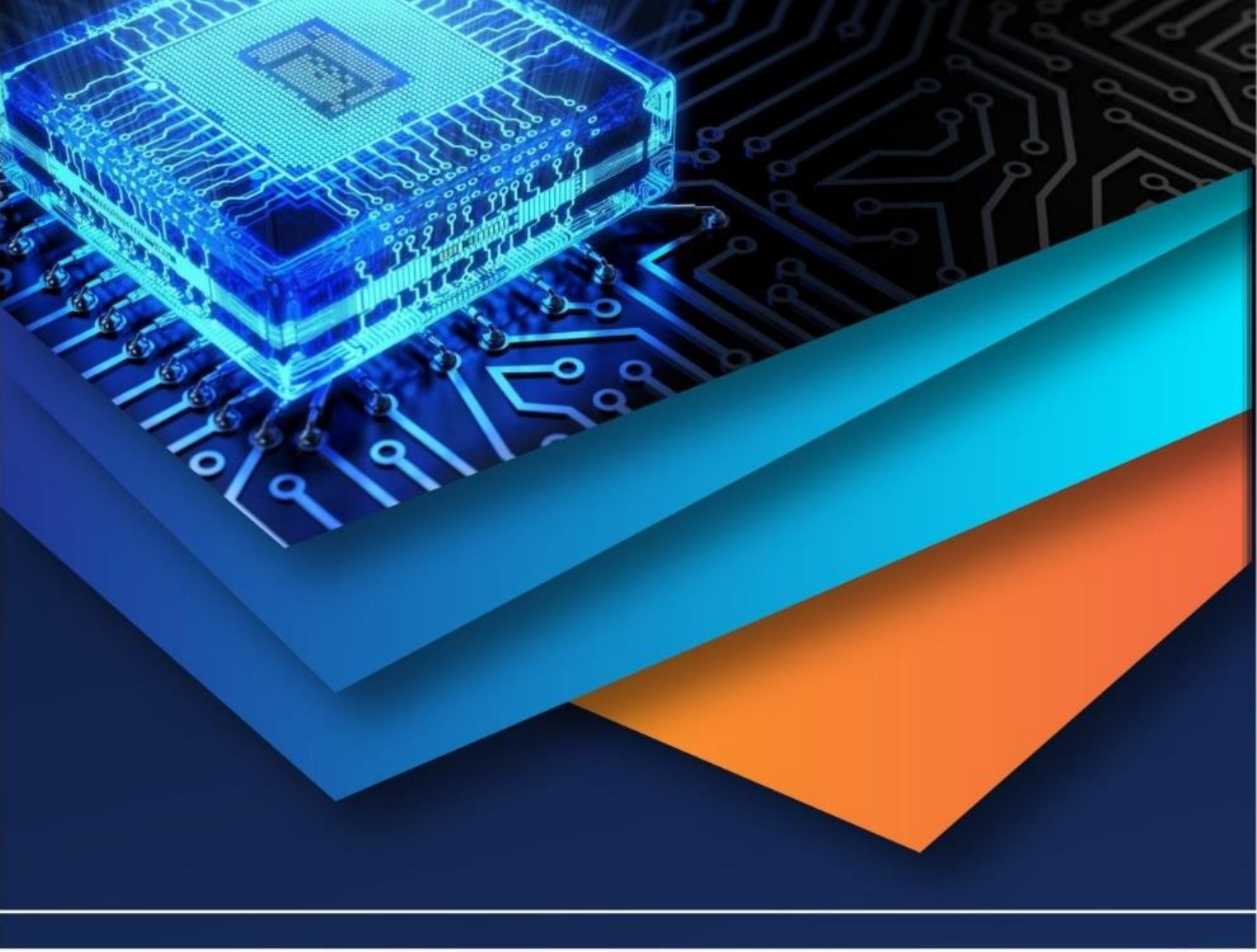

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