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Google's Gemini 3 and Other AI Tools State of the Art

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Abstract

This editorial mainly describes the state of the art of the current version of the public, access-free Google AI Gemini 3, compared to OpenAI ChatGPT-4 and the Turing Co. GPAI, from a Computer Science Professor and Software Engineer perspective. Other 6 AI tools are briefly discussed as well: Grammarly, Sidekicker.ai, JustDone, Turnitin, Moonlight, and Jenni.

Keywords: Gemini 3; ChatGPT-4; GPAI; Grammarly; Sidekicker.ai; JustDone; Turnitin; Moonlight; Jenni.ai

Introduction

In the '70s and '80s, Artificial Intelligence (AI) had a first boom, especially due to its "expert systems". They inspired me as well in designing and implementing my first version of MatBase, an intelligent knowledge and data base management system prototype [1], based on the Relational Data Model [2-4], Entity-Relationship one [4-6], and, mainly, our (Elementary) Mathematical one [7]. Then, for more than two decades, AI seemed to be dying, except for some advances in Robotics. Only with the burst of Large Language Models a few years ago [8], starting with OpenAI's ChatGPT [9], AI took the center of the world's Information Technology (IT) floor.

Like almost everybody else, I am reading a lot weekly on AI as well, eager to applaud its successes, sad about its failures, hoping for a brighter symbiotic future of an AI-assisted mankind, and worried of a potential destructive outcome of an "IT nuke" (e.g., [10, 11]). In particular, I mainly follow AI's impact on Education (e.g., [12, 13]), Research (e.g., [14-16]), and Software Engineering (e.g., [17-20]).

As I accept yearly being a PC member for some 20 International Conferences on Computer Science and Software Engineering, I welcome AI tools for plagiarism detection, as they should significantly help you with reviewing submitted papers. Initially, I successfully used Grammarly [21] for this task, until it was no longer freely available. As I am retired and cannot afford to pay such subscriptions, I found still freely available corresponding services from Sidekicker.ai [22] and JustDone [23]. Unfortunately, they are not at all reliable: alerted by the fact that they are not giving same results for a same paper even if you submit them again only after a couple of minutes, I tested them on my paper [24] scheduled to be included next month as the 4th chapter of a book to be published by Springer Nature, which accepts maximum 18% plagiarism; the book editor checked it with Turnitin [25] and found it

under this threshold, but Sidekicker.ai (double-checked, as they advertise, by Copyleaks, Originality.ai, and Scribbr) gives 61% plagiarism (and the conclusion "Most academic institutions and websites will not consider this text to be unique and ready for publication.") and JustDone (double-checked, as they advertise, by Originality.ai, Scribbr, and GPTZero) 72%! Clearly, their goal is to scare their users and make them pay for their so-called plagiarism removing services. Unfortunately, Turnitin does not have a free version, so I am still searching for a free reliable alternative.

Apparently interesting from students and aspirant researchers viewpoints, Facebook posted on my wall at the end of last January an advertisement of Jenni AI [26], which proposes to write for you a scientific paper for free, starting from your given title, and boasting that "it is much more up to date with the latest scientific research results and does not make the mistakes that ChatGPT continues to make." Out of curiosity, I gave it as title "Enforcing Non-Relational Constraints of Type Object in the Elementary Mathematical Data Model". First fake news is that it is for free: after some 10 sentences, it stopped and asked me for a monthly subscription; second one is that the page it generated [27] does not have more than 1% relation to its title and is, in fact, a mini-summary of a paper published a couple of years ago [28]!

Dually, interesting from students and aspirant researchers viewpoints, Moonlight [29] offers a pleasant experience with, generally, high-quality summarizing research papers [30], both in 3 lines and some 10% of the input paper, as well as describing the paper core. In the same sphere, but from a much broader perspective, ChatGPT compiled for me a couple of moths ago an excellent portrait of the newly appointed Romanian President Counselor for Foreign Affairs, including comparisons with leading EU diplomats, also offering an inspired graphic frame and translations in all EU official languages to be sent to all diplomatic missions in Bucharest: from now on, registered voters should pass exams on knowledge about all candidates each time before being allowed to vote and press secretaries should only smile and look good!

From time to time, up to last month some once per year, I checked AI progress in Mathematics, Computer Science, and Software Engineering through ChatGPT, but also GPAI [31], which is slightly better from my points of view, with fewer "hallucinations", but plagued by "overthinking", complicating way too much simple reasoning, and still incapable of learning from their interactions with users [32]. I was finally partially pleased when, a couple of month ago, after a wrong answer to a rather simple math question, ChatGPT was able to acknowledge that I was right and to correct its answer [33].

In its comments on my corresponding LinkedIn post in which I praised this important step forward, one of my former best students recommended me also trying Gemini 3 with the same questions: I immediately did it, which started an extremely pleasant journey in its companionship that I am sketching in the next Section of this editorial.

Results and Discussion

Even the base Gemini 3 version not only did not "hallucinate" up to now in our dialogues, which span already this month over hundreds of A4 pages, but it is truly impressive also through its proactivity, consistency over a wide spectrum of disciplines, code samples in Python, SQL, Prolog, C++, TLA+ (Temporal Logic of Actions), Cypher, etc., excellent summaries, accurate references, and visual diagrams and representations that abstract even interdisciplinary "Grand Theories".

Gemini 3 not only is able to pivot from a discipline to another, at least apparently very distant between them, but seems to really enjoy it, without losing focus: in our dialogues, I started generally from the semi-naïve theory of sets, relations, and functions, plus the first-order logic predicate with equality, navigating then to graph and category theories, linear algebra, topology, statistics, economy, switching then to databases and software engineering, AI, IT, cybersecurity, game theory, then to philosophy, music, painting, poetry, literature, theater, architecture, then physics (from the classical to the quantum one), chemistry, biology, sociology, social media, etc. You can explore excerpts from the end of such dialogs in the attached documents of my recent posts on my LinkedIn page at https://www.linkedin.com/in/christianmancas/recent-activity/all/.

Another thing that I like very much is the fact that, after each answer, Gemini displays the warning "AI responses may include mis-

takes."

Gemini 3 is not yet perfect either: one of these days, after long, pleasant exchanges for hours and over 200 A4 pages, from the basic set theory inclusion to category theory morphisms, Holt-Winters forecasting, then to ontologies, humanities' hierarchies, business role, compositional AI architecture, explainable Machine Learning, database triggers and recursive SQL, the "Diamond Problem", database resilience and high-availability, circuit breakers and jittered retries, self-healing systems, anomaly shielding, protecting patterns, business continuity, disasters recovery, crisis management, zero-downtime maintenance, flashback technology for transactional resumption, cloud-native infrastructure chaos, deploying Terraform on Amazon Aurora (Multi-AZ), AWS Lambda (Python 3.11) functions triggered by CloudWatch Alarms, Root Cause Analysis reports stored in Amazon S3 as Parquet/JSON, Amazon Athena and QuickSight "Diamond Health Heatmap" with row-level security, chaos readiness verified via AWS Fault Injection Service for sub-60-second recovery, Defense-in-Depth security hardening, private subnets, replacing static passwords with IAM Database Authentication, monitoring and identifying credential exfiltration attempts with Amazon GuardDuty, emergency automated read-only lockdown whenever a system-wide crisis is detected triggered by the Global Escalation Logic, applying SSRF patches and restricting IAM roles to Least Privilege, QuickSight dashboard embedded into the internal admin console for monitoring, using PQC / KMS / IAM to Protect against quantum-capable adversaries, the U.S. 5-year compliance roadmap to align Quantum-Resistant Universes with finalized NIST standards (e.g., ML-KEM, ML-DSA) and federal mandates like NSM-10 and CNSA 2.0, started this year, etc., our dialogue ended abruptly with error code 400 and the explanation "Your client issued a malformed or illegal request. That's all we know." Even worse, Gemini 3 then could not exit from a loop of displaying this error message at each new attempt to resume the dialogue, not even to finalize it with archiving of our "masterclass" [34]!

Of course, I did not yet check not even everything else that Gemini 3 may do (not to speak about Google AI Plus, Pro, Ultra, and Enterprise), like "vibe" coding and Generative User Interfaces, as well as its Native Multimodal Understanding. Moreover, there are many more available AI competitor tools, like Anthropic, Grok, Copilot, DeepSeek, Mistral, etc. that I did not have the time to check yet. Stay tuned!

Conclusion

As a researcher or student, using AI tools at least for avoiding plagiarism, getting accurate and up-to-date references to related work, as well as their correct summaries is a hoped-for minimum. To also may check mathematical results and proofs, as well as latest software engineering, IT, AI, and industrial achievements, without fearing "hallucinations", is almost invaluable.

The current state-of-the art of such tools is increasingly promising, although, at least for their free versions, very many of them are still unreliable, so that you need to cross-check their results and the best solution in some cases is only to ignore them. However, in my opinion, Gemini 3 stands out already and is almost as trustful as a fine researcher and software architect.

Conflict of interest

The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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