Three Underestimated LLM Impacts

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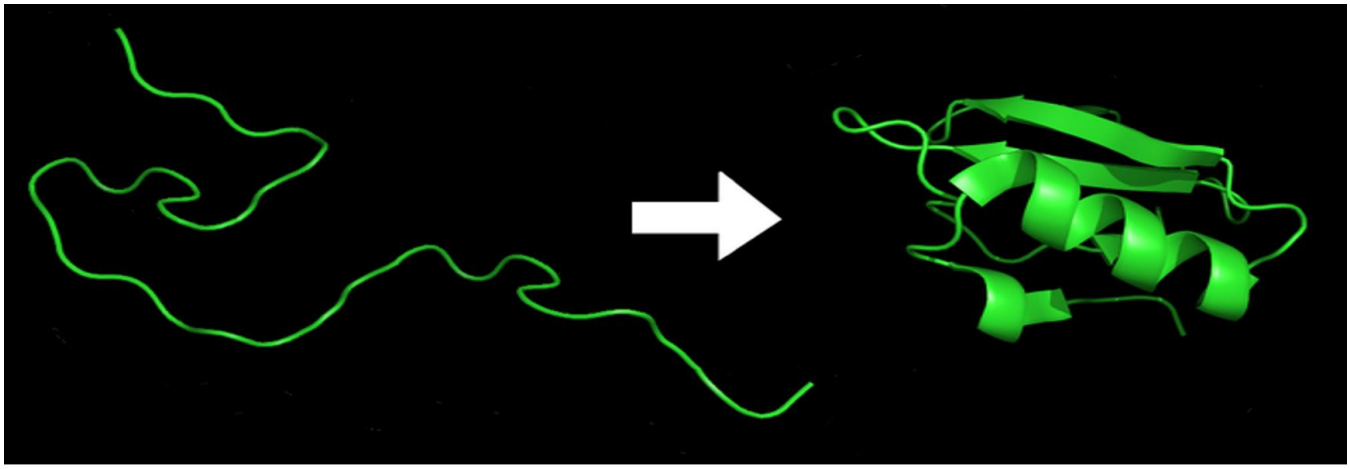

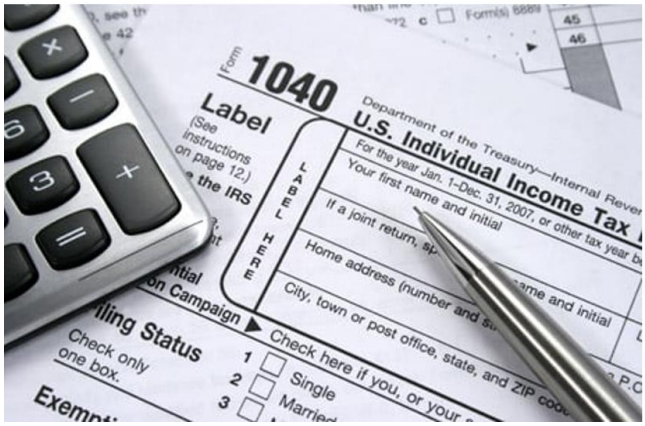

Underestimated LLM impacts include data extraction, job replacement, and infrastructure collapse.

Folks seriously underestimate the impact of LLM technology in three main ways:

(1) Handling enormous scientific data sets.

The 2024 Chemistry Nobel Prize award for continuing progress in mapping DNA to final protein configurations is a good example of this potential, as is the ability to visualize black holes. The full range of LLM value in handling scientific data is likely still underestimated. One qualifier: If one treats LLMs as exploratory tools for finding rules that one can then convert into vastly more efficient traditional software, these benefits might be considerably higher. Explicitly recognizing the holographic nature of LLM data storage could also help here, since matrix multiplication using real-number data storage is an extremely inefficient way to capture and process the underlying Fourier transform processes that make LLMs useful for processing large data sets with repeating patterns. Even better, an explicitly Fourier LLM strategy opens the path to using extremely energy-efficient optical Fourier transforms.

(2) Automated replacement of large categories of human work.

Large numbers of well-understood, well-solved tasks often characterize information work niches ranging from mundane tax form processing to advanced but highly specialized medical diagnosis. When LLM hallucination suppression in such niches reaches levels where LLMs are more likely to give valid advice than human experts, LLM tech has the potential to wipe out entire domains of human jobs quickly and irreversibly. This underestimation amounts to a faster, more centralized, and more energy-intensive way of continuing existing automation trends using human-coded software. Ironically, these uses often amount to providing easier-to-use access to that same human-coded software, which still exists beneath the layers of LLM access.

For these levels of automation, it's worth noting that when mechanical devices replaced horses for transportation, the number of horses dropped precipitously. It's worth pondering the social implications and possible future paths for doing the same kind of automated replacements of large numbers of humans. Good outcomes are possible, but so are strikingly unpleasant dystopias in which the majority of humanity becomes more like the missing horses than beneficiaries of automation.

(3) High potential for entropic dissolution of physical and social infrastructure.

All LLM technologies destroy facts by converting them into shared networks of weighted probabilities. This conversion is where hallucinations and high energy consumption originate, since only certain well-formed queries have the ability can recover enough of the original data pattern to recreate the original fact with a high degree of certainty. A fact that would have cost vanishingly small amounts of energy to recover with near certainty on a traditional small computer can end up costing kilowatt-hours of energy when restored repeatedly from an entire server farm's worth of distributed weights.

The potential for global-scale entropic dissolution arises from the fact that LLMs replace biological insight and self-correction with interpolation, that is, with drawing lines between whatever dots of factual data are available. Interpolation works well when strong patterns exist in the data, such as in DNA-to-protein correlations, but becomes essentially identical to random number generation when presented with sparse data or data in which no such correlations exist.

Combining interpolation with holographic fact dissolution creates a truly spectacular potential for catastrophic entropic dissolution not only of software-dependent physical infrastructure, but of human social networks. Without an effective self-correction method, errors and drift accumulate until the entire structure dissolves rather abruptly into mush. Hallucination suppression hides this danger without fixing it, and has the potential to make the eventual dissolution event worse rather than better.

The nominally pro-LLM site ai-2027.com acknowledges such risks indirectly by adding occasional comments about continuing risks of any query that deviates from the "right" form of facts-only data recovery — a task that will only increase in difficulty for human users over time as their knowledge of whether the answers are correct or hallucinations deteriorates over time. Here is one such quote:

"The agents are impressive in theory (and in cherry-picked examples), but in practice, unreliable. AI Twitter is full of stories about tasks bungled in some particularly hilarious way. The better agents are also expensive; you get what you pay for, and the best performance costs hundreds of dollars a month."

The critical question is whether current LLM research sufficiently addresses the self-repair issue. Adequate addressing of self-repair is unlikely at present, since the defining feature of self-repair is simplification of structure. LLM approaches, in contrast, focus more on how to "fix" each new problem as it emerges by adding new corrections. Accumulating fixes without finding deeper corrections is riskier than it sounds, since it becomes the source of infrastructure dissolution. Exponential growth of fixes must eventually overwhelm even the most powerful global computing infrastructure.

Biological self-repair, which amounts to layers of multi-scale "Eureka" moments, appears to be extraordinarily energy efficient. It begins with generating order from chaos at the molecular level (the Hopfield Nobel papers from 1974). It extends up to cases such as the Archimedes incident that led to the name of the effect.

We are missing something extremely important about self-repair and self-simplification, and it appears increasingly unlikely that fully digital LLM strategies can ever replicate it.

The degree of LLM underestimation for dissolving physical and social infrastructure is truly spectacular. Rather than acknowledging the danger of an exponential explosion of fixes that inevitably overwhelm even global-scale computing resources, the current strategy of acquisition and heavy reuse of existing knowledge and software solutions, and presenting them using an easy-to-use LLM interface, effectively sweeps the dissolution problem under the rug. Instead of addressing the complexity growth problem, the current solution involves increasing global computing capacity whenever the dissolution issue starts generating too many nonsensical hallucinations to convince people to use the product.

The outcome should be fascinating to watch, even if fatal for many.