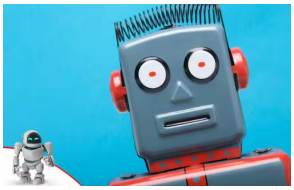
The ChatGPT Conundrum

High absolute, low relative Kolmogorov complexity



[Editor's Note: Our usual blog format has the first paragraph lead with a human subject, but that does not apply here. —RJL and KWR]

Today, on this delightful April 1st, we bring you an intriguing revelation about the now-famous AI model, ChatGPT, which has gained notoriety for its ability to generate human-like text.

As many of you know, ChatGPT has been a hot topic in the computational world, but today we reveal a surprising truth: ChatGPT demonstrates high absolute Kolmogorov complexity but low relative Kolmogorov complexity.

This breakthrough insight, which we'll call the "ChatGPT Conundrum," has profound implications for complexity theory.

KC

Recall that the Kolmogorov complexity of a string is the shortest program (in some fixed programming language) that outputs the string. The absolute Kolmogorov complexity is concerned with the shortest program that produces a given string, while the relative complexity is the shortest program that produces the string, given another string as input.

Our investigation began when we received an anonymous tip from a ChatGPT researcher who goes by the pseudonym "Alan Turing Jr." They shared with us an unpublished manuscript detailing the intricate inner workings of the ChatGPT model. This document—codenamed "The GPT-4 Enigma"—revealed that ChatGPT's design is incredibly complex, leading to high absolute Kolmogorov complexity.

However, what truly piqued our interest was the revelation that ChatGPT's output exhibits low relative Kolmogorov complexity when compared to any input. This means that, given an input string, there is a short program that generates ChatGPT's output

using the input as a starting point. This may seem counterintuitive, as the AI produces incredibly human-like text, but it turns out that the model leverages its vast knowledge of the internet to create this illusion of complexity.

A New Class

This discovery led us to formulate a new complexity class, dubbed "CHP" (ChatGPT's Humble Paradox), which captures the unusual behavior of the ChatGPT Conundrum. As one would expect, CHP lies somewhere between P and NP, but it turns out it is also incomparable to both! This perplexing result has left the complexity theory community in a state of bewilderment.

On a lighter note, we have heard rumors that a secret society of computer scientists is working on an even more advanced AI model, GPT-5. They hope to harness the ChatGPT Conundrum to create an AI that can solve NP-complete problems in polynomial time! If they succeed, we might finally have an answer to the age-old P vs. NP question.

Open Problems

Of course, we must remind you that today is April Fool's Day. Could this tale be an elaborate hoax? Or is it a genuine breakthrough that will reshape our understanding of complexity theory? We leave it up to you, dear reader, to decide.

Happy April Fool's Day.