

TRANSFER EXAM

Dept. of Foreign Languages and Literature, NTHU, June 26, 2023

Read the two passages below and answer the following essay questions. This test is 100-minute long.

PASSAGE ONE

Noam Chomsky: The False Promise of ChatGPT

The human mind is not, like ChatGPT and its ilk, a lumbering statistical engine for pattern matching, gorging on hundreds of terabytes of data and extrapolating the most likely conversational response or most probable answer to a scientific question. On the contrary, the human mind is a surprisingly efficient and even elegant system that operates with small amounts of information; it seeks not to infer brute correlations among data points but to create explanations.

For instance, a young child acquiring a language is developing — unconsciously, automatically and speedily from minuscule data — a grammar, a stupendously sophisticated system of logical principles and parameters. This grammar can be understood as an expression of the innate, genetically installed “operating system” that endows humans with the capacity to generate complex sentences and long trains of thought. When linguists seek to develop a theory for why a given language works as it does (“Why are these — but not those — sentences considered grammatical?”), they are building consciously and laboriously an explicit version of the grammar that the child builds instinctively and with minimal exposure to information. The child’s operating system is completely different from that of a machine learning program.

Indeed, such programs are stuck in a prehuman or nonhuman phase of cognitive evolution. Their deepest flaw is the absence of the most critical capacity of any intelligence: to say not only what is the case, what was the case and what will be the case — that’s description and prediction — but also what is not the case and what could and could not be the case. Those are the ingredients of explanation, the mark of true intelligence.

The crux of machine learning is description and prediction; it does not posit any causal mechanisms or physical laws. Of course, any human-style explanation is not necessarily correct; we are fallible. But this is part of what it means to think: To be right, it must be possible to be wrong. Intelligence consists not only of creative conjectures but also of creative criticism. Human-style thought is based on possible explanations and error correction, a process that gradually limits what possibilities can be rationally considered. (As Sherlock Holmes said to Dr. Watson, “When you have eliminated the impossible, whatever remains, however improbable, must be the truth.”)

But ChatGPT and similar programs are, by design, unlimited in what they can “learn” (which is to say, memorize); they are incapable of distinguishing the possible from the impossible. Unlike humans, for example, who are endowed with a universal grammar that limits the languages we can learn to those with a certain kind of almost mathematical elegance, these programs learn humanly possible and humanly impossible languages with equal facility. Whereas humans are limited in the kinds of explanations we can rationally conjecture, machine learning systems can learn both that the earth is flat and that the earth is round. They trade merely in probabilities that change over time.

QUESTIONS

1. According to the authors, why is ChatGPT underlying different from real human intelligence? Summarize the main point in 100 words. (20%)
2. In addition to the points made by the authors, explain how ChatGPT could NOT reshape the learning and teaching of human language in 200-300 words. Give concrete examples based on either scientific studies or your own experience. (30%)

PASSAGE TWO

The following is a short story by American author Ted Chiang, published in 2005:

What's Expected of Us

THIS IS A WARNING. PLEASE READ CAREFULLY.

By now you've probably seen a Predictor; millions of them have been sold by the time you're reading this. For those who haven't seen one, it's a small device, like a remote for opening your car door. Its only features are a button and a big green LED. The light flashes if you press the button. Specifically, the light flashes one second before you press the button.

Most people say that when they first try it, it feels like they're playing a strange game, one where the goal is to press the button after seeing the flash, and it's easy to play. But when you try to break the rules, you find that you can't. If you try to press the button without having seen a flash, the flash immediately appears, and no matter how fast you move, you never push the button until a second has elapsed. If you wait for the flash, intending to keep from pressing the button afterward, the flash never appears. No matter what you do, the light always precedes the button press. There's no way to fool a Predictor.

The heart of each Predictor is a circuit with a negative time delay; it sends a signal back in time. The full implications of the technology will become apparent later, when negative delays of greater than a second are achieved, but that's not what this warning is about. The immediate problem is that Predictors demonstrate that there's no such thing as free will.

There have always been arguments showing that free will is an illusion, some based on hard physics, others based on pure logic. Most people agree these arguments are irrefutable, but no one ever really accepts the conclusion. The experience of having free will is too powerful for an argument to overrule. What it takes is a demonstration, and that's what a Predictor provides.

Typically, a person plays with a Predictor compulsively for several days, showing it to friends, trying various schemes to outwit the device. The person may appear to lose interest in it, but no one can forget what it means; over the following weeks, the implications of an immutable future sink in. Some people, realizing that their choices don't matter, refuse to make any choices at all. Like a legion of Bartleby the scriveners, they no longer engage in spontaneous action. Eventually, a third of those who play with a Predictor must be hospitalized because they won't feed themselves. The end state is akinetic mutism, a kind of waking coma. They'll track motion with their eyes, and change position occasionally, but nothing more. The ability to move remains, but the motivation is gone.

Before people started playing with Predictors, akinetic mutism was very rare, a result of damage to the anterior cingulate region of the brain. Now it spreads like a cognitive plague. People used to speculate about a thought that destroys the thinker, some unspeakable Lovecraftian horror, or a Godel sentence that crashes the human logical system. It turns out that the disabling thought is one that we've all encountered: the idea that free will doesn't exist. It just wasn't harmful until you believed it.

Doctors try arguing with the patients while they still respond to conversation. We had all been living happy, active lives before, they reason, and we hadn't had free will then either. Why should anything change? "No action you took last month was any more freely chosen than one you take

today,” a doctor might say. “You can still behave that way now” The patients invariably respond, “But now I know.” And some of them never say anything again.

Some will argue that the fact the Predictor causes this change in behavior means that we do have free will. An automaton can’t become discouraged, only a freethinking entity can. The fact that some individuals descend into akinetic mutism while others don’t just highlights the importance of making a choice.

Unfortunately, such reasoning is faulty; every form of behavior is compatible with determinism. One dynamic system may fall into a basin of attraction and wind up at a fixed point, while another exhibits chaotic behavior indefinitely, but both are completely deterministic.

I’m transmitting this warning to you from just over a year in your future; it’s the first lengthy message received when circuits with negative delays in the megasecond range are used to build communication devices. Other messages will follow, addressing other issues. My message to you is this: Pretend that you have free will. It’s essential that you behave as if your decisions matter, even though you know they don’t. The reality isn’t important; what’s important is your belief, and believing the lie is the only way to avoid a waking coma. Civilization now depends on self-deception. Perhaps it always has.

And yet I know that, because free will is an illusion, it’s all predetermined who will descend into akinetic mutism and who won’t. There’s nothing anyone can do about it; you can’t choose the effect the Predictor has on you. Some of you will succumb and some of you won’t, and my sending this warning won’t alter those proportions. So why did I do it? Because I had no choice.

QUESTIONS

1. Summarize the story in under 100 words. (25%)
2. Do you agree with the narrator’s remarks on free will? If so, why? If not, why not? Answer in under 100 words (25%)